Report of the Cabinet Sub-Committee Appointed to Review the Operations of the Water and the Sewerage Authority and to Determine a Strategy for enabling the Authority to Achieve its Mandate

DECEMBER 11, 2020

MEMBERS OF THE CABINET SUB-COMMITTEE

THE HONOURABLE MARVIN GONZALES M.P. (CHAIRMAN)
MINISTER OF PUBLIC UTILITIES

SENATOR, THE HONOURABLE FRANKLIN KHAN
MINISTER OF ENERGY AND ENERGY INDUSTRIES

THE HONOURABLE CAMILLE ROBINSON-REGIS M.P.
MINISTER OF PLANNING AND DEVELOPMENT

THE HONOURABLE STUART YOUNG M.P.
MINISTER OF NATIONAL SECURITY AND MINISTER IN THE OFFICE OF THE PRIME MINISTER

SENATOR, THE HONOURABLE DONNA COX
MINISTER OF SOCIAL DEVELOPMENT AND FAMILY SERVICES

THE HONOURABLE PENNELOPE BECKLES M.P.
MINISTER OF HOUSING AND URBAN DEVELOPMENT

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS

ACD	- Automatic Call Distribution
AMI	- Advanced Metering Infrastructure
Bn	- Billion
CAF	- Corporación Andina de Formento (Development Bank of Latin America)
CAPEX	- Capital Expenditure
CEO	- Chief Executive Officer
CUMN	- CISCO's Unified Communications Manager System
CWIP	- Community Water Improvement Programme
Desalcott	- The Desalination Company of Trinidad and Tobago
DMA	- District Metered Area
EMA	- Environmental Management Authority
EPA	- Estate Police Association
FAO	- Food and Agricultural Organisation of the United Nations
FY	- Fiscal Year
GIS	- Geographical Information System
HDC	- Housing Development Corporation
HR	- Human Resource
ICT	- Information and Communications Technology
IDB	- Inter-American Development Bank
IMG	- Imperial Million Gallons
IMGD	- Imperial Million Gallons per Day
IFC	- International Finance Corporation
IR	- Industrial Relations
IVM	- Interactive Voice Management System
IVR	- Interactive Voice Response System

IWA	- International Water Association
IWIP	- Integrated Water Improvement Programme
IWRM	- Integrated Water Resources Management
Labidco	- La Brea Industrial Development Company Limited
Mn	- Million
MOF	- Ministry of Finance
MOWT	- Ministry of Works and Transport
MP	- Member of Parliament
MPU	- Ministry of Public Utilities
NRW	- Non-Revenue Water
NUGFW	- National Union of Government & Federated Workers
NWC	- National Water Commission
OMS	- Outage Management System
OPEX	- Operating Expenditure
PBC	- Performance-Based Contract
PCM	- Programmes and Change Management
PSA	- Public Services Association
PSIP	- Public Sector Investment Programme
QSS	- Quality of Service Standards
RIC	- Regulated Industries Commission
SCADA	- Supervisory Control and Data Acquisition
SOP	- Standard Operating Procedure
T&T	- Trinidad and Tobago
T&TEC	- Trinidad and Tobago Electricity Commission
TCPD	- Town and Country Planning Division
USD	- United States Dollars
VESP	- Voluntary Employment Separation Programme

WAS	- Water and Sewerage
WASA	- The Water and Sewerage Authority
WHO	- World Health Organisation
WRA	- Water Resources Agency
WTP	- Water Treatment Plant
WWC	- Water Works Caribbean Inc.
WWTP	- Wastewater Treatment Plant

Executive Summary

Executive Summary

The Current Model

Over time, the Water and Sewerage Authority (WASA) has become an unwieldy, overstaffed, unproductive, unresponsive organization that has deteriorated and is no longer efficiently serving the citizens of Trinidad and Tobago. In numerous instances and over many decades, efficiency was sacrificed for, inter alia, political patronage and management accountability exchanged for industrial stability, resulting in an organization in which there is little co-relation between the contents of collective agreements and the realities of providing a reliable service to the national population at an affordable, and acceptable cost to the taxpayers of Trinidad and Tobago.

The Sub-Committee has concluded that the dysfunctions inherent in WASA are so deeply entrenched that, in its current form, the organization is incapable of effectively satisfying its customers' demands and the State's mandate. Continuation of the current WASA model will therefore generate further decline and exacerbate the downward spiral in all aspects of the Authority's operation.

Maintaining the status quo leaves the State in the unsustainable and unacceptable position of continuing to fund, to the tune of almost two billion dollars ($2Bn) annually, an organization that lacks the ability to transform itself. Moreover, it will be an exercise in gross futility to ignore all the exigencies associated with attempting to operate/create an industrial entity by bringing together seven (7) government operated water production facilities (See Section 2.1.1) into one legal and organizational framework. This model has long outlived its usefulness and to continue conducting proverbial surgery on WASA in the hope that it would become efficient would be an exercise in futility.

The Sub-Committee is of the view that the only practical solution lies in the incremental dissolution of WASA in its present configuration and its replacement with the creation of a Water Management Company within a revised Water Sector model.

At its core, the new model for Trinidad and Tobago speaks to a water sector which is technology driven, customer focused and commercially viable, with an operationally efficient Water Management Company in the lead. Further, as this new orientation emerges over a period of three (3) years; the existing structure, WASA, has to be rationalised and wound down, transferring the assets of the old order into the emerging (structure) company.

The Sub-Committee has identified a number of Enabling Transition/Transformation factors that must be urgently addressed since they form the basis of the actual movement from the old order to the new. They include: establishment of a new water company, acquisition of water management capability, winding up and concessionary negotiations with the three (3) registered majority trade unions, aligned parallel operations, and technology enhancement. The Sub-Committee envisages the creation of a Transition Team/Contracted entity to conduct/facilitate this aspect of the transition.

Though cognisant of the fact that the country will need to invest in both the old and the emerging entities, the Sub-Committee is equally appreciative that this is the cost of the transformation. Funding will need to be available to address the bringing of the enabling factors

WASA's dysfunctionality at a glance

Corporate Performance

- For decades, WASA has been unable to deliver on its mandate – to provide a reliable supply of water at a reasonable price to the vast majority of the population
- By internationally and regionally accepted standards of 8 staff per 1,000 connections, WASA's current ratio of 13 staff per 1,000 connections renders it grossly overstaffed
- Project management is abysmally poor, evidenced by inordinate delays in execution (execution rate on capital projects of 51%), costly cost overruns, and unspent balances on PSIP with no commitments attached
- There are no corporate performance indicators to measure targeted outputs of within WASA
- The Authority is operating blindly. There is an absence of credible information in key areas relating to the Authority's operations e.g. customer data base, liabilities, staffing levels, payables, location of transmission and distribution mains, extent of non-revenue water
- WASA does not appear to have the will or capability to transform itself

into being. It will also be required to meet the cost of new technology, enhancement of WASA's current operating assets, treatment of debt, and other liabilities including employee separation cost. It is time for a **"Reset"** in this critical sector. The restructuring of the existing statutory authority is unlikely to produce the desired outcome.

Indubitable Facts

The decline in Government revenues arising out of the fall in oil and gas prices coupled with the cumulative financial impact of the COVID-19 pandemic has made it near impossible for the Government to continue injecting large sums of money into WASA without proportionate returns. And, even if funding was available, it would make no good sense to continue throwing good money after bad. After many years and several ineffective though costly interventions, the evidence points to an overwhelming lack of focus on comprehensive, sustainable, sequenced interventions, resulting in Government's investment being directed to ad-hoc projects that have not cumulatively improved the supply of water to the country. Despite receiving some $21.6 Bn. in Government subventions from FY 2010 to FY 2020, the Authority has been unable to fulfil its mandate with only an estimated 34% of the population currently getting a 24/7 supply of water.

Today, WASA is a dysfunctional organisation, which requires fundamental transformation.

The top-heavy Management of WASA is ineffective, and the contents of freely negotiated collective agreements reveal a philosophy of securing industrial peace by ceding control of the Authority to the Unions, to the point where

WASA's dysfunctionality at a glance

Organization Design

- The organization is extremely top heavy with a narrow span of control throughout the whole organisation
- WASA is overstaffed by over 2000 employees.
- Previous attempts at right sizing, inclusive of Voluntary Separation have failed
- The Operations Department maintains an "Interim Structure" which does not lend itself to collective achievement

Operations

- There is an absence of contemporary technology designed to improve operations while reducing cost.
- Both water quality and production have been trending downwards over the last five years
- Current state of technical capability is incapable of re-engineering the Authority's plant and equipment
- WASA does not follow a preventative maintenance system

the Unions have now effectively subsumed many management responsibilities. In some cases, the Agreements constrain the Authority from reengineering and introducing new and contemporary water management technologies into its operations, without first securing the Unions' approval. The structure of the collective agreements, in the main, is based on anachronistic public service ranges and job designs and consequently, bear neither relevance nor relation to an organization whose services are demanded on a 24-hour basis, seven (7) days per week for 365 days of the year. There exists compelling evidence as well that the Unions have become suppliers of goods and services to the Authority whilst it seems that management turns a blind eye to this reality. The Unions have also encouraged their members not to cooperate with Internal Audit in legitimate investigations of internal wrongdoing as well as to refuse to sign on to any Charter to improve accountability and good corporate governance within the Authority.

"Staff culture with an ingrained mentality of earning inflated remunerations without attendance addition of value and excessive union interference e.g. Union having to approve promotions etc. Union insisting employees refrain from signing Code of Ethics and Business Conduct, being interviewed by IACD, not signing as evidence of reviewing Policies and Procedures" Robert Subryan, Head - Internal Audit and Compliance

WASA's dysfunctionality at a glance

WASA's Financials

- High levels of unrecorded payables
- The annual allocation to WASA of approximately two billion dollars ($2Bn.) represents approximately 6% of country's budgeted figures for 2020. This allocation excludes debt and overdraft, which runs at one hundred million dollars ($100Mn.).
- Accounts Receivable is unclear since the WASA's billing system is inefficient and at the same time incomplete (relative to the number of connections)
- It is unlikely that the utility will meet its operating cost in the future (normal bench mark for successful water utilities)

There is a general lack of accountability pervading the organisation, and the existing organisational culture is the very antithesis of a highly productive organisation.

Further, successive years of under investment in asset maintenance and renewal has compromised and crippled operational efficiency. Spare parts, for example, are at a premium, and more often than not, a trade-off has to be made in terms of either undertaking necessary repairs or installing new connections, which has led to backlogs in both areas. Moreover, after decades of monopoly operations and $21.6Bn. in annual subventions from 2010 to 2020, the Authority does not currently possess the in-house equipment to effectively undertake one of its core functions (pipeline installation and repairs) and is heavily reliant on contractors to whom they are heavily indebted. The extent of this unquantified debt is the subject of a seemingly interminable verification exercise, resulting in a high level of unrecorded account payables. Account receivables have also been very high, with the average time taken to collect receivables being 188 days. Unsurprisingly then, the Authority's overall financial performance has been poor with chronic deficits being a regular feature. This is breeding ground for corruption and there is concern that there is a culture of corruption in the procurement of services by the Authority.

Investment in technology too has been sporadic and not always well integrated into the Authority's operations. Management of the transmission and distribution network has been equally inefficient, and has not leveraged innovative technologies to allow for automation and real-time monitoring and control of the system, which would ensure that water of good quality is efficiently delivered only when and where it is

WASA's dysfunctionality at a glance

Labour Relations

- The collective bargaining process is severely unbalanced in the Unions' favour and leaves little or no room for management to undertake its responsibilities and have any useful level of accountability from workers.
- Extricating the Authority from these arrangements is very unlikely in the face of the strong unions.
- Collective Agreements include traditionally non-negotiable items such as promotion, appointments that normally should be the prerogative of management, and constrains the organisation in terms of navigating industrial operating challenges e.g. certain types of leave.
- Senior levels of management are represented by the Union. This incestuous relationship renders bargaining in good faith a serious challenge to management, and restricts management's ability to redesign jobs, the dysfunctional organisational structure, or even introduce new and innovative technology. In short, it is virtually impossible for management to design a fit for purpose organisation

needed. Many of the operational processes such as leak identification, water redistribution, turn cork operations, water quality checks and meter readings, are still done manually.

Systemic Failures

WASA's intractable issues have manifested itself in the form of operational and service failures where hundreds of thousands of citizens are unable to get either a reasonable supply of water or a suitable and timely response to their plight. This is symptomatic of deep-rooted problems in the institution's mental model. WASA's Executives are not held to account, deploy very limited controls, are not effectively regulated, apply very antiquated, technology-deficient systems, and are generally devoid of an understanding of WASA's role, relationship and the consequences of the Utility's actions on the national population. This problem cascades down from the Executives to the rest of the organisation, spinning a vicious cycle that has led to public mistrust of WASA, an unwillingness of some customers to pay even one of the world's cheapest water rates, and WASA being unable to survive without significant Government funding.

WASA's Current State – Some Facts

- In 2019-2020, WASA's production averaged 218 IMGD[1] of water, while domestic and non-domestic demand is estimated at 155.4 IMGD. Non-Revenue Water (NRW) consisting of water lost through leaks and theft is estimated within the range of 40-50% (87.2-109 IMGD). The supply deficit in the dry season is 79 IMGD and the annual average deficit is 24 IMGD.

WASA's dysfunctionality at a glance

Organization Culture: The way WASA works

- The culture is a social benefits culture where work is peripheral to employees' benefits. Such benefits include car loans, vacation loans, study leave, and home to office allowance. These benefits are not normally associated with daily paid employment, for example, paid leave for religious reasons, and home ownership plans, neither of which is directly aligned to productivity.
- There is a mental model embedded throughout the organisation, inclusive of the unions and even some venders, that given the criticality of water to the population, the State is obligated to fund WASA's operations, regardless of its corporate performance
- Overtime is institutionalised and represents an average 15% of the monthly wage bill. The Collective Bargaining Agreement (Daily Paid) makes provision for equal distribution of overtime work to be divided among the various category of workers on the job.

[1] Imperial Mega Gallons per Day

The systems and data do not exist to corroborate this high NRW but with an average of 2,755 leaks being reported monthly, there is sufficient cause to inspire belief.

- Approximately 54% of water produced comes from surface sources, 26% from ground water, and the remaining 20% from desalination.
- Water is distributed to about 96% of the population, but 24/7 water supply is estimated to be: 59% in the wet season and 34% in the dry season for Trinidad, and 40% in Tobago - with homes augmenting supply through tanks.
- Total water storage across both islands is 14,729 IMG, which translates to less than 70 days (~2 months) of water, in the event that there are no inflows to any reservoirs. WASA's total storage per capita, equates to around 10,500 gallons, 38 times lower than the storage capacity of Jamaica (400,000 gallons per capita.)
- Centralised wastewater systems operated by WASA cover about 20% of the population, while another 10% are privately operated.
- Total assets are low compared to other water utilities, indicative of chronic historical investment shortfalls, and inadequate rehabilitation of the network.
- Revenue generated from the sale of water is gleaned from domestic customers (33%), Pt. Lisas (25%), industrial customers (25%), and the remaining 17% from commercial and agricultural users.
- Tariffs have not been increased since 1993 and is now one of the lowest in the world. The Sub-Committee has undertaken a review of the RIC process in order to ensure that timely action is taken by all relevant State Agencies (Appendix IV).
- WASA has a staff complement of 4,828[2] employees. This number does not include 47 members of the Executive Management Team, and 80 staff related to the Adopt a River Programme, Beetham Wastewater Project, Tobago Wastewater Project, Tobago Expansion Services Project and Customer Contact Centre Representatives. Staff costs (Wages and Salaries) represent approximately 177% of total revenue and 45.6% of total operating costs.
- WASA cannot cover its operating costs through tariff revenues. Consequently, WASA's operations, its solvency, and its financial sustainability are entirely dependent on funding and financing guarantees from the Treasury. The Treasury also services WASA's debt

[2] As at September 30, 2020

portfolio, which stood at $4.5Bn. as at September 30, 2020, inclusive of an overdraft of $469Mn.

Challenges to Moving to a Future Model

The Committee recognises that the challenges that confront the State, in its attempts to reform the sector and WASA as its agent, are significant and daunting. These are systemically complex and pose serious risks if carried over to any new configuration. Some of these are:

Outdated Governance Structure: The 1965 Water and Sewerage Act is outdated. There are conflicts between the Water Resources Agency, which is the resource regulator and WASA as the water operator. As an example of its outdatedness, the Act does not recognise the role of the Regulated Industries Commission (RIC) as the economic regulator, which has negative implications for the performance and regulation of the entire water sector. Additionally, there is the historical absence of performance-based accountability and an unacceptable lag in proper financial reporting. Altogether, this points to a governance model that reinforces and even rewards gross underperformance and negative practices. . The Authority envisaged under the Act is outdated.

Organisational Inefficiencies: WASA's machinery is frustratingly slow and reactive in almost all aspects of its business. The organisational structure is convoluted, is not Cabinet approved and is woefully short on internal coordination, control and accountability. The Authority has not been able to achieve any of its stated strategic targets over the past ten (10) years and has underperformed based on all standard performance indicators and in its capital works programme. Standard policies and operating procedures are poor, where they exist; and asset management is severely lacking. When compared to the regional benchmark of eight (8) employees per 1000 connections, WASA's staff per connection ratio of 13 employees per 1000 connections is unacceptably high, and has resulted in duplication and redundancy in business operations. The organisation also suffers from inefficiencies in fit at all levels, including at the Executive Management level.

Outdated technology and Poor Data Analytics: WASA's adoption of modern information and operational technologies is low. Management and operational systems have not been modernised to incorporate and fully integrate new and cutting edge technologies which are being

increasing used by utility companies globally to reduce cost, increase efficiency and enhance customer experience. Across the organisation, the Systems and Data architecture is poor and data analytics is not voluntarily embraced. This is especially evident in the Operations Division, where much knowledge is based on intuition and anecdotal data rather than on sound data and information. As such, the information emanating from WASA is manifestly unreliable and is not a reasonable basis for making sound policy and investment decisions. Technology has not been adopted and utilised to increase efficiency.

Demand/Supply Imbalances: A significant deficit exists between water supply and demand on both a regional (North, South, Central and Tobago) and temporal (dry and wet season) basis. This is primarily attributed to: a very high per capita consumption of water; inadequate interconnectivity within the transmission and distribution network; aged and inefficient network infrastructure, unaccounted for water, and inadequate water storage capacity.

Limited Development/Upgrading of Wastewater Systems: Wastewater management in the country has generally been neglected with centralised coverage at a low 30%. Many areas, particularly in Central Trinidad, do not have a centralised system while facilities and assets throughout the country are in dire need of upgrade/expansion/maintenance. This situation can have potentially disastrous consequences for public health and the environment.

Derelict Assets: Low tariffs and revenue collections, coupled with effectively no metering (4% of customer database) and an inadequate focus on existing infrastructure, especially those underground, have resulted in an aged distribution network that is challenged in servicing current demand.

High Non-Revenue Water: NRW is estimated in the vicinity of 40-50% which is high by international standards. This is due to a combination of an aged network infrastructure, poor water pressure management, the current system of supply scheduling, the time lag in fixing leaks, and the historical focus on putting new water sources into the system instead of concomitantly reducing NRW. As a consequence, there has been inadequate investment in the maintenance and upgrade of assets.

Financial Dependence on State Resources: Water utilities utilise a lot of power and are extremely capital intensive with most of their assets hidden underground. Years of neglected asset replacement, very low tariffs and revenue collections, plus high overstaffing have all contributed to WASA's current predicament. The operating deficit reached $2Bn. at the end of FY 2020 – with expenditure and revenue for the same period at $2.75Bn. and $709Mn. respectively. WASA has become accustomed to receiving large Government subventions annually - $21.6Bn. from FY 2010 to FY 2020, with few hurdles, without proper accountability, without penalty and with poor/inadequate governance. This has allowed the organisation to request and utilize such subventions without properly accounting for them (evidenced in the last audited financial statements being 2016); the absence of an acceptable policy framework; without strategic and business plans; and without a robust reporting framework that holds management and the Board of Commissioners accountable for performance.

Poor Project Management Systems: WASA's systemic planning, management and execution weaknesses have all but rendered it incapable of implementing its capital projects, whether simple or complex, on time and within budget. WASA's failings are also manifested in the number of legacy projects that have taken more than five (5) years to complete, with the *Refurbishment of the El Socorro Water Works* and the *Desilting and Rehabilitation of the Hillsborough Dam* standing out as prime examples of that inefficiency.

Heavy Reliance on Desalinated Water: The desalination plant at Point Lisas, was constructed to supply water to industrial customers on the Point Lisas Industrial Estate, its primary market. Water produced in excess of that requirement was to be used by WASA to supplement its supply to residents and businesses in south Trinidad. Overtime, with an expansion in the capacity of the desalination plant from 24mgd to 40 mgd, and with the recent closure of some plants on the Point Lisas Estate, a disproportionate amount of this water (28mgd) has been used to close the demand/supply imbalance for customers in South Trinidad. This over-reliance on desalinated water from Desalcott places WASA in a very vulnerable position and creates supply-chain risks and the associated higher costs of water production being effectively paid for by WASA. This vulnerability is manifested in the reduction of production levels by Desalcott from time to time, which is seen as a leverage to secure settlement of outstanding indebtedness to the company. Recently, production was reduced to 24mgd, but the supply has since been restored following negotiations. . The cost of the desalinated water coupled with the contractual requirement to pay

for same in United States Dollars has crippled WASA and resulted in a direct strain on the Treasury.

Corruption-laced Water Trucking Services: The delivery of truck borne water is based on request, and all customers with updated accounts qualify for the service. When requesting a truck borne supply, customers are required to call the Authority's toll free numbers. Water truckers, both contracted and internal, are not authorised to collect payment. Unmetered domestic and non-domestic customers with accounts in good standing are not supposed to pay for WASA's truck borne water. Only metered customers pay for WASA's truck-borne service through the addition of the receiving volume of water from the trucks onto their metered accounts.

WASA's truck borne service is inefficiently managed and, as a consequence, its operation is fraught with many problems, including lack of fit for purpose tankers, some of which are oversized and are unable to navigate narrow streets and steep hills, long queues and Call Centre challenges (see 2.4 Customer Service). This situation has rendered the service uncertain and unreliable, and has spawned the development of a thriving, parallel and illegal water trucking service, where hapless, desperate customers are willing to pay up to $400 for a truck borne water supply, the source of which in some cases cannot be verified.

High Customer Dissatisfaction: The population is unconvinced of WASA's ability to provide a reliable service, exasperated by the sheer inefficiency of its call centre operations, and mistrusting of WASA's management and staff to improve their offering. At all levels, WASA's customer services are unacceptable. Historically, the Authority has been unresponsive to customers whether it is fixing leaks, dealing with complaints, or delivering water. Customer dissatisfaction is further compounded by insufficient and reactive communication, especially as it relates to the consistency of service schedules, supply disruptions and billing queries.

Poor Management of the Water Sector Ecosystem: While many of the failures in providing reliable water and wastewater services to the population are a consequence of WASA's weaknesses, the vulnerabilities and shortcomings of the entire water sector ecosystem are pertinent contributors. There is no independent regulator of water resources resulting in WASA exploiting the country's freshwater supply without concern for operational efficiency. There is no coordination in the management of the water environment by regulators – EMA, Minerals Division, TCPD, Drainage

Division, Regional Corporations, etc. – resulting in rampant degradation of the natural ecosystem that protects and sustains the country's freshwater resources. The RIC, as the independent economic regulator has not demonstrated focused attention to the water sector as it has for electricity. The quality of service standards have been in draft form for the past 3+ years, there has been no active push to review the principles of water rate setting, and WASA is left untouched when it does not answer to the RIC.

Pressing the Reset

Trinidad and Tobago is currently navigating its way through some difficult and precipitous economic headwinds and Government is doing its part to keep the ship of state steady. The present state of our water sector can aptly be described as being so deep in crisis that it can imperil our socio-economic well-being and national stability.

With consistently declining national revenues due to low prices in our petro-chemical sector, and the debilitating effects of climate change, environmental degradation, wastage, chronic mismanagement, poor corporate governance, lack of maintenance, aging infrastructure, low tariffs, higher demands from a growing population, mounting debts, unaccounted for liabilities, weak financial realities etc, the Authority is now faced with the perfect storm and is struggling to maintain a semblance of national stability to provide citizens with a reliable water supply and wastewater services. A well-documented IDB report, described the amalgamation of these deeply entrenched challenges as the ***"Spiral of Decline."***

A Government of Trinidad and Tobago that is committed to re-positioning the country to survive in the post-pandemic new order, must accept the challenge to take bold and decisive action to stabilize the possible collapse of the water sector and to engage in a process of urgent organisational reconstruction of WASA and, in so doing, protect the national interest.

As envisaged by this Sub-Committee, the process of reconstruction will require decisions that, while politically unpopular, are necessary to protect the overall national good. This Sub-Committee recommends that given the national exposure and in alignment with our oath of office, sound decisions must be adopted to protect the citizenry from declining availability of water in the Authority's distribution grid.

The evidence is as clear as it is compelling that by international indicators, WASA has failed as a utility company both in the provision of a reliable water service to the country as well as its organizational structure. The Water Resources Agency has been crippled and has not been performing its role as a regulator in the industry. The Agency has not been doing its work in the areas of scientific research to explore new sources of water and to regulate existing practices that expose the country's water resources.

The Sub-Committee has concluded that WASA would be unable to transform itself into a high performance utility given in its current configuration and with its current leadership, management capability, systems and culture, to transform itself into a high performing public utility.

The Sub-Committee holds the view that now is the time to **Press the Reset** and move towards a high-quality performance water utility, with a governance framework that is designed for performance and accountability and with the concomitant legal and institutional capacity.

In designing the institutional architecture, the Sub-Committee has been guided by the following:

- Water is increasingly becoming a critical resource for all countries, and will undoubtedly continue in that trajectory given the worsening impacts of climate change and climate variability;
- International best practice has demonstrated the criticality of separating the water resources regulator from the water utility, to ensure sustainability and equity in the utilisation of water;
- Wastewater management has emerged as a specialist field;
- There has been a paradigm shift in water resource management with the adoption of new management approaches and significant increases in the use of technology;
- Contemporary business water management models have shifted to demand management rather than production and engineering as its base, as is the case of the current WASA model.
- Aligning the water utility with the value chain inherent in water management provides the opportunity to increase operational efficiency and achieve sustainability in water resource management.

Alternate Options for the Water Sector

The Committee considered three (3) options for the Water Sector:

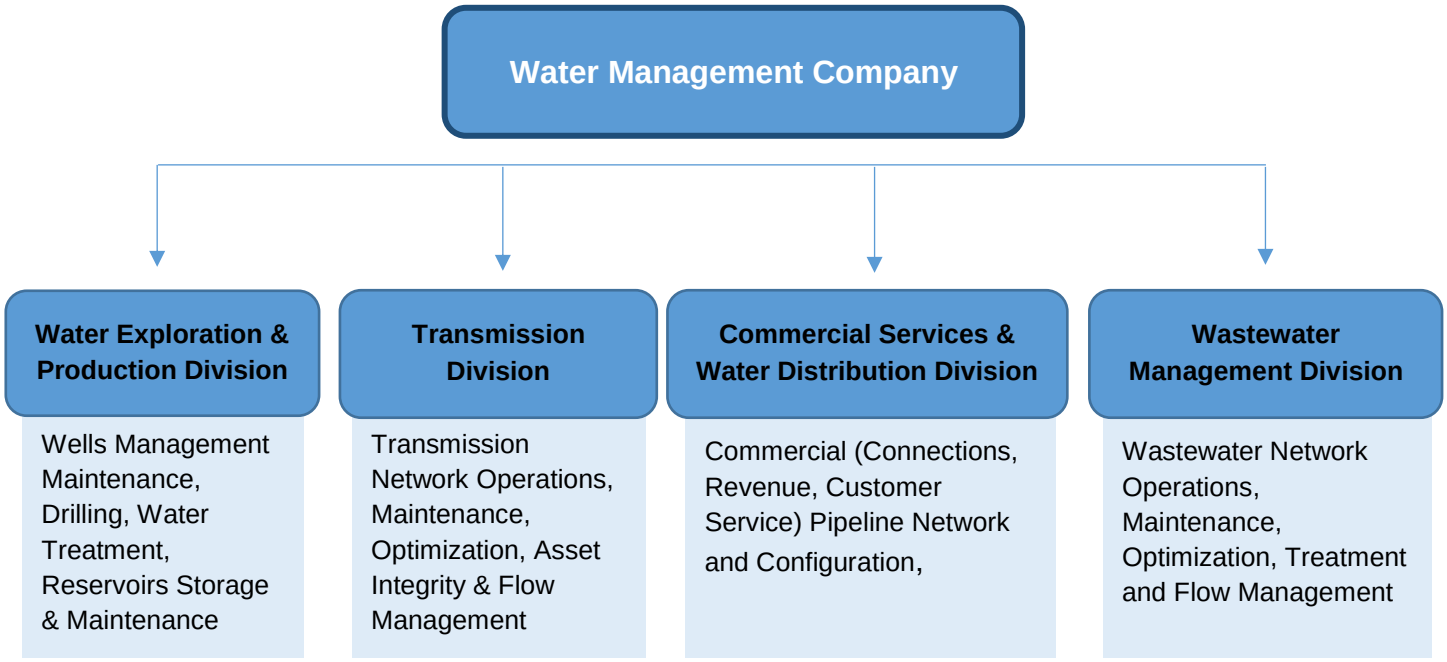
- Option A: Create Private Sector Partnerships
- Option B: Restructure the current WASA organization
- Option C: Adopt a Water Management Corporatised Model

Descriptions of the consideration of each are presented in Section 3.1 of the Report.

Recommended Option for Managing the Water Sector (Option C):

The Sub-Committee recommends the adoption of a Water Management Corporatised Model that is consistent with the water value chain and structured as follows:

- A Water Resources Agency that is independent of the water and wastewater utility. A Note is before the Cabinet on an Integrated Water Resources Management Policy which, *inter alia*, recommends the establishment of an independent Water Resources Agency. Towards this end, the Sub-Committee recommends that the WRA be established as a department under the Ministry of Public Utilities;
- A New Water Management Company: Publically owned water company that maintains all the State's Interests (Above & Below Ground Assets) with operations aligned to the water value chain as follows:
  - An Exploration and Production Division (Wells Drilling, Water Treatment, Reservoir Storage & Maintenance
  - A Transmission Division (Pipeline Maintenance, Optimization, Asset Integrity & Flow Management)
  - Commercial and Distribution Division (Pipeline Network and Configuration, Revenue, Customer Service etc.)
- A Water and Sewerage Authority (WASA) that holds and manages the non-operating assets of the State that are currently vested in the Authority; and
- A wastewater entity managed by the new Water Management Company with Private Sector participation.



ES Figure 1: Water Management Company

Transition to the New Model

The Sub-Committee is cognisant of the fact that rationalising the existing WASA will entail time and political will and, therefore, recommends the creation of an Interlocking Board and possibly a Committee designated to oversee and implement the process with both reporting to a Cabinet Sub-Committee which includes the Minister of Public Utilities, in order to facilitate an efficient transition to the new Water Sector. Presented below are the critical action items.

- Separate the Water Resources Agency from WASA;
- Establish a performance agreement and timelines for the Board and the Committee to achieve the Government's policy intent;
- Appoint an Interim Management Team, headed by an individual with extensive knowledge of, and experience in leading transformation in, the water sector and comprising a core group, in accordance with a rationalised structure, with skills and competencies in water management. The Interim Management Team will have responsibility for:
    - working with the Board of Commissioners in the transitioning process;
    - stabilising the operations of WASA to prevent further declines in the level of service to the population and financial haemorrhaging. The Team will be required to:

- ✓ **undertake an analysis of the current water supply situation in the different operating zones of both islands, identify crisis areas and solutions to ensure that all communities across the country receive a minimum of 24/2 water supply in the short term;**
- ✓ **rationalise expenditures in key areas;**
- ✓ **examine viable options for an effective staff rationalisation exercise and to ameliorate the social impact on affected employees;**
- ✓ **introduce measures to immediately enhance customer service;**
- ✓ **develop required policies and procedures and implement necessary system changes to enable WASA to function more efficiently in the interim period before operations are transferred to the new Water Management Company by the year 2023;**

  - implementing a new project management system for the implementation of the PSIP to stabilise the water supply environment in the short term. The track record of the current PCM Division, especially as it pertains to its role in the management of key infrastructure projects of the Authority, demonstrates that this Government will be making a grave error to allow the current Unit to manage a programme of works geared towards bringing short, medium and long term solutions to the state of the water sector in the country. The Committee recommends an immediate restructure of the Unit;
  - Developing a roadmap to remove the country's reliance on desalinated water, particularly in the area of potable water;
  - removing road restoration, following civil works by WASA, from under the purview of WASA to the Ministry of Works and Transport (MOWT);
  - defining a strategy and action plan for private sector participation in key elements of the water value chain and in wastewater;
  - setting the foundation for transformation to the new Water Management Company;

- Procure the services of an international Water Management Operator to support the transition to the Water Management Company;
- Procure the services of international expertise to optimise network performance and transform key elements of operations such as leak management, water storage facilities, billings and collections;
- Facilitate the requirements of the RIC for an urgent Tariff review;

- Appoint technical teams to:
    - implement new institutional arrangements, conduct an HR audit, identify transitional and permanent staff, create the organisational structures with role definition and process maps for the new water and wastewater utility;
    - undertake a full assessment/audit of WASA's water supply and wastewater assets. The team should locate, assess and verify the usefulness and ownership of the asset;
    - conduct an assessment of WASA's technological capability;
    - gather data and develop the scope and targets for a performance-based contract (PBC) for an international Water Management Operator;
- Adopt an Agile Change Approach in defining and designing the new water management model while navigating the rationalisation resizing and exiting of the old model;
- Develop a detailed risk assessment and mitigation strategy;
- Develop and implement a Transition Framework and Strategy over a period of approximately three (3) years that addresses the key enablers for the transition to the new water sector management model;
- Undertake a detailed validation exercise of WASA's liabilities (recorded, unrecorded and on Government books);
- Rationalise WASA's expenditure to separate core services from non-core services, and assess the cost-effectiveness of subcontracting certain functions;
- Acquire water management expertise (International Water Management Operator) for a period of three (3) years that will support the Interim Management Team and the CEO of the Water Management Company to establish the Company and transition to full operations. The current deeply rooted institutional arrangements and the exposures faced by the WASA will militate against Government's thrust for urgent organizational restructuring. Pressing the reset may be the perfect opportunity for a new organization to be established under the Companies Act, with the assistance of an International Water Management Company. This can be done using a Performance Based Contract that holds the company strictly to timelines and clear deliverables;
- Develop and execute a work plan for the transfer of assets and wind-up of WASA;
- Design and action a broad-based Transition Communications Strategy that informs, educates and influences all stakeholders in a manner that views them as significant partners in the country's transition to a new and productive water management sector; and

- Source an appropriate mix of multilateral funding (grant and loan resources) and Government to Government agreements to finance improvements in water supply to the population, the establishment and operationalising of the new institutional arrangements for the water sector, and the transition arrangements.

Strategic Pillars to Guide the Transition Process

The Sub-Committee recommends four (4) strategic pillars to guide the management of the sector over the next three (3) years:

1: Stabilise the operations of WASA and build public confidence in the Operations of the Water Sector and Government's Strategic Intent;
2: Improve Operational Efficiency and Customer Service;
3: Strengthen Financial Management; and
4: Restructure the Water Sector.

The timeline envisaged for the transitioning to the new institutional arrangements and the schedule for the implementation of critical actions under these four (4) pillars are provided at Appendix I and Appendix II, respectively.

Risks

The risks associated with the transitioning must be closely and continuously assessed and managed. The major risks identified by the Sub-Committee are as follows:

- The State will need to maintain and stabilize the supply of water during the transition;
- The transition cost and funding required for moving from the existing model to the new model will be a risk and must be assessed early;
- The cost of maintaining two water entities is prohibitive and may have to be addressed in phases;
- Trade Unions will be reluctant to support the transition and engender employee dissatisfaction and the withholding of labour;
- The operations knowledge of WASA is highly intuitional, largely undocumented and reposed in individuals who might not be minded to share such knowledge with those outside of their circle; and

- The mistakes of previous attempts at reform and right-sizing are repeated. The VSEP exercise of 2012-2015 e.g. cost the Authority $396,579,367 for 2352 employees but the employee population remained at a consistent level of 4844, 5350, 4910, 4833, and 5285 in the years 2011-2015.

The Sub-Committee has also identified an indicative programme of infrastructure related investments for implementation over the next 24 months in order to increase water supply, improve network efficiency and capture essential data to manage distribution more effectively (Appendix III).

Financing

The transitioning to the new model comes with new and significant financing needs as the operations of WASA are stabilised and the new Water Management Company is formed and operalionalised. Investments would be needed not only in new infrastructure and new technologies but also in the maintenance and operations of the existing stock in order to improve efficiency and reduce water losses. The 'plane would need to be fixed while flying'.

With respect to financing, the Sub-Committee had valuable engagements with senior officials of the Inter-American Development (IDB), Corporación Andina de Formento (CAF) and a consortium comprising Water Works Caribbean Inc. (WWC), a Barbados based water delivery and management Company, Seureca - the engineering consulting group of Veolia France and Remicatyn Ltd. - a supply chain consultancy company registered in Trinidad and Tobago.

The Consortium proposes the possibility of a Government to Government Agreement with the Government of Germany. Both IDB and CAF offer a mix of technical cooperation and loan financing. In addition, the International Finance Corporation (IFC) has identified five (5) possible projects for implementing PPPs. The best option will have to be explored and options are not limited to those described.

Conclusion

Trinidad and Tobago needs to adopt a modern integrated water management strategy for the water and wastewater sector. Restructuring the way that water is delivered to the national

community will lay the platform for the change the country desperately requires. The current state of the country's finances, and public expectations in terms of customer service, all militate strongly against the State maintaining the status quo.

WASA's current structure, culture and institutional arrangements cannot respond to the water supply crisis now faced by the national community. A new organisation must be created in order to fashion an organisational culture and competencies that lend itself to organisational change and more appropriately, should be designed along a business value chain that utilises, inter alia, technology and modern water delivery systems resulting in more efficiency. The transition must be predicated on new technologies, sound governance model and a healthy balance between a production/engineering and demand management. The establishment of a new organisation is as necessary as it is urgent. A new start will bring a business-orientation, public ownership and workforce arrangements that are relevant, modernised, and in alignment with the service levels demanded by the entire country.

The Sub-committee is of the view that as a country, we are more than capable of undertaking the difficult task that lies ahead as we now seek to place our water sector on a sustainable path. In this regard, a sub-committee of the Cabinet should be established to provide strategic oversight and guidance during the proposed transformation of the water sector for and on behalf of the citizens of T&T.

Introduction

1. Introduction

The Water and Sewerage Authority ("WASA" or "The Authority") is the executing arm of the State responsible for providing water and wastewater services to the people of Trinidad and Tobago (T&T). The 1965 Water and Sewerage Act, which established the Authority and its governance structure, is now outdated. This archaic governance structure allows for WASA to operate in an opaque environment without adequate supervision and accountability resulting in the less than strategic and prudent use of national resources as well as sub-par service delivery to the citizenry.

WASA's current state of non-performance has historical roots, with decisions taken, and/or not taken, in the past collectively resulting in the classic utility downward spiral. This is manifested in (i) very low tariffs, (ii) one of the highest per capita usages in the world, (iii) continuous postponement of maintenance leading to derelict assets, and (iv) chronic overstaffing and inefficiencies, all culminating in poor customer service and abysmal financial performance with no apparent end in sight for the demand for Government intervention via transfers and subsidies.

During the period 2010-2020, over $25Bn. of State resources (Subvention - $21.6Bn. Capital projects under the Public Sector Investment Programme (PSIP) - $3.65Bn.) were transferred to WASA, yet the quality of service delivered to the majority of the population remains unacceptably poor. The current state of the national economy notwithstanding, prudent and efficient management dictates that this state of affairs be arrested with alacrity. Even more critical is the fact that WASA's monumental inefficiency and unresponsiveness have become increasingly intolerable to the national population.

The fundamental imperative confronting the Government, of providing a consistently reliable supply of water to the national population, can no longer be delayed, and therefore the time has come to "***Reset"*** and commence the systematic transformation of WASA. There is no other option.

Prime Minister, Dr. the Honourable Keith Rowley initiated the first steps towards this transformation via his appointment of this Cabinet Sub-Committee to review the operations of WASA and to determine the strategy for enabling the Authority to deliver on its mandate. The Committee was given two (2) months to complete its review and make recommendations.

This Report is the culmination of two (2) months of intensive review of the current state of affairs at WASA and thoughtful deliberations on the way forward. The Committee held in-person and virtual meetings with key stakeholders and requested written submissions to supplement the information provided at meetings or where meetings were not possible. Among the key stakeholders engaged were:

- The Chairman and Commissioners of the Board of Commissioners of WASA;
- The Chief Executive Officer (CEO) and the Executive Management Team of WASA including the Corporate Secretary, the Internal Auditor and the Director of Operations;
- The Chairman of the Regulated Industries Commission (RIC);
- The Head of the Water Resources Agency (WRA);
- Representatives of the Labour Unions;
- Mr. Rawlinson Agard, Strategic Management Consultant;
- Former Employees of WASA; and
- A Consortium of Water Works Caribbean Inc.(Barbados-based), Seureca-Veola of Paris, France and Remicatyn Ltd (T&T based).

The Sub-Committee also had valuable engagements with the President of the National Water Commission (NWC) of Jamaica and with senior officials of the Inter-American Development Bank (IDB) and Corporación Andina de Formento (CAF).

State of Affairs at WASA

2. State of Affairs at WASA

2.1 GOVERNANCE AND INSTITUTIONAL ANALYSIS

2.1.1 Governance

WASA is a statutory authority created by an act of Parliament—Act 16 of 1965. The Act was modified by a series of amendments that essentially established WASA as the sole supplier of water and wastewater services. Its mandate is also defined in the Act as being …

> *"The Authority is responsible for maintaining and developing the waterworks and other property relating thereto and for administering the supply of water thereby established and promoting the conservation and proper use of water resources and the provision of water supplies in Trinidad and Tobago."*

The original Act brought together services originally provided by a number of agencies:

1. The Central Water Distribution Authority;
2. The Port of Spain City Council;
3. The San Fernando Borough Council;
4. The Arima Borough Council;
5. The County Councils;
6. The Water Division of Public Utilities; and
7. The Sanitation Division of the Ministry of Public Utilities (MPU).

The regulatory framework within which the utility operates includes:

- The RIC;
- The EMA; and
- Occupational Health and Safety Act.

WASA's approved governance model is consistent with the model that operates in a number of the better-run water utilities in developing countries. While the Act is in dire need of modifications to reflect the 21st Century, its current form does not necessarily hinder the strategic management and operations of the Authority.

Water as an Inalienable Right

On 28th July 2010, the United Nations General Assembly explicitly recognised the human right to water and sanitation and acknowledged that clean drinking water and sanitation were essential to the realisation of all human rights. The question that matters is what is the most viable and efficient arrangement for the attainment and enjoyment of that right over the next five (5) to ten (10) years in T&T.

Within this context, the main legal instrument of the Water and Sewerage (WAS) Act can and should be reconfigured to separate the responsibility of the Water Resources Agency (WRA) for maintaining oversight of the management of the resource, from the production and dissemination of the resource.

The business model that has evolved over time and has the Chairman of the Board of Commissioners of WASA reporting to the relevant line minister (Minister of Public Utilities).

2.1.2 Organisational Structure

Organisation Design

The Authority's Cabinet-approved organisation structure makes provision for four (4) levels of managerial staffing. This includes an Executive Management, led by a CEO, comprises six (6) Directors, who are supported by seven (7) General Managers, 32 Managers and 126 Supervisors in seventeen (17) major Divisions.

The current functional structure is relatively horizontal with a very narrow span of control. This is further complicated by the six (6) levels of management exclusive of the supervisory level. The inordinately large number of Deputy Assistants and Unit Managers that has crept into the system challenges both staff and management to coordinate activities and projects while simultaneously adhering to the lines of authority. WASA's leadership hierarchy is now twice that of the standard organisation practice of 3-4 levels of management. The current organisation structure consists of 17 major divisions under six (6) directors. The current staffing complement is approximately 4,828 employees, notwithstanding a detailed and expensive VSEP exercise between 2012-2015.

Cabinet Approved (1999) vs Current Structure

WASA currently operates with an organization structure that differs vastly from that which was approved by Cabinet in 1999. The structures differ fundamentally along the lines of (i) Staffing, (ii) Management, (iii) Structure and (iv) Function as outlined in Table 1.

Table 1 The stark and fundamental differences between the Cabinet Approved and Current Organisation Structure

CATEGORY	1999 CABINET APPROVED STRUCTURE	CURRENT UNAPPROVED STRUCTURE
Staffing	1,723 employees	Over 4,828* employees: 3,043 monthly paid and 1,785 daily paid workers. *This figure excludes the 47 members of the Executive Management Team, Adopt a River Programme (14), Beetham Wastewater Project (23), Tobago Wastewater Project (4), Tobago Expansion Services Project (8) and Customer Contact Center Representatives (31).
Executive Management	2 levels inclusive of CEO	5 levels inclusive of CEO
Structure	7 main divisions	7 main divisions. Operations division has an arrangement classified as an "Interim structure", which operates regionally and is further fragmented along sub-regional lines.
Functional	Clear delineation of divisions. Alignment of functional and operational outputs to goals.	Heavy duplication of functions amongst divisions. Gross misalignment of functional and operational outputs to goals.

Staffing

WASA is currently operating in excess of the 1999 Cabinet approved structure by more than 3,152 employees. This translates into a high staff per connection ratio of 13 employees per 1000 connections, exceeding the regional benchmark of 8 employees per 1000 connections[3]. By all international standards, WASA is grossly overstaffed.

The overall relationship between the Management functions in the organisation and employees is 12.1. The acceptable international norm at the Senior Manager or Vice President level is 20:1. This suggests that WASA is also exceedingly top-heavy. The third level or supervisory leadership is 1:15 to 1:25. Using the best available estimates, this should be in the region of 1:35. As such,

[3] Diagnostic Report on the State of the Water and Sewerage Authority, Ministry of Public Utilities, 2018

even if it is determined that the organisation is to retain its current headcount, the ratio of top management to employees should not be less than 1:38.

Unauthorised Top Management Structure

Whereas the 1999 Cabinet-approved structure calls for four levels of leadership and a complement of 172 employees, WASA's current top management structure includes eight (8) levels: Directors, Heads, Senior Managers, Managers, Assistant Managers, Section Managers, Unit Managers and Supervisors, totaling 426 employees or approximately 248% in excess of the approved structure. (Table 2)

Table 2 WASA's Management Levels

CATEGORY	QUANTITY
Executive Management - Directors	8
Executive Management - Heads	19
Executive Management – Senior Managers	32
Departmental Managers	88
Assistant Managers	25
Section Managers	35
Unit Managers	23
Supervisors	196
TOTAL:	**426**

On the evidence therefore, WASA's leadership is exceedingly top-heavy and possesses an injudiciously long chain of command, which is twice that of the standard acceptable norm of 3-4 levels[4]. The 426 management personnel also possesses a narrow and costly span of managerial control with a ratio of 1: 1-2, which is below the international norm of 1:4-5[5].

[4] WASA Top Management Assessment, Final Report, Rawlinson Agard,2018
[5] WASA Top Management Assessment, Final Report, Rawlinson Agard,2018

2.1.3 Organisation Culture

WASA has an embedded non-productive socially oriented work culture that is buttressed by a view that given the critical nature of the resource, the State is duty bound to maintain the operations of the institution. Successive management teams have proven powerless to the Unions' encroachment on the Authority's rights to manage, direct and own its operational affairs. The practice of Overtime, for example, is endemic and has emerged as a standard operating practice, particularly in the Security Department, which has the highest attributable percentage of overtime cost.

Highly Dysfunctional Operations Division

The Operations Division is the only division divided along regional lines. It operates within an "Interim Structure" arrangement, which demonstrates:

- Multiple layers of management all reporting to the Director of Operations, i.e. Regional Heads, Sub-regional Senior Managers, Area Managers and, in some cases, even Zonal Managers;
- Duplicated positions including Human Resource (HR) Officers, Project Officers, Customer Service Representatives and Engineers;
- Replicated functions including Customer Support, Security, HR and Project Development;
- Structural fragmentation of technical services such as Water and Waste Water Management and Water Trucking, which are better suited as centralized functions;
- Obstruction of effective communication and coordination; and
- Poor accountability across regional operations.

Misplaced Board Focus

Most notably, a review of the Board discussions and subsequent decisions indicate a heavily skewed focus on Management Supervision (66%) rather than on Strategic Planning (9%) (Figure 1).

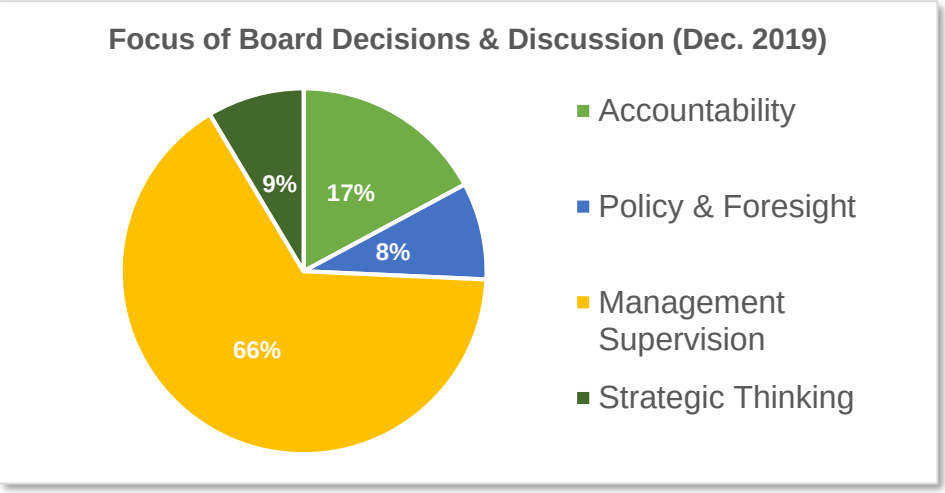


Figure 1 Focus Areas of the Board of Commissioners

Management Lethargy

There has been no demonstrable evidence of urgent and decisive action being taken on multiple fraud investigations, as well as, more than 100 overdue, high-risk controls and recommendations in urgent need of implementation despite the numerous promptings of the Internal Audit Division.

An Emasculated Authority

WASA is unable to act independently because successive management teams have ceded or abandoned their fiduciary responsibilities to the three (3) representing Trade Unions in exchange for industrial stability. Contrary to standard and acceptable practice, the Unions are heavily involved in numerous human resources activities such as the assigning of promotions, performance management, benefits and allowances to employees. Additionally, the Unions are known to routinely instruct their members to disregard proper procedure surrounding WASA's Code of Ethics and Internal Audit reporting structure, as per the interpretation of the Collective Agreement. (See WASA Industrial Relations framework)

Failed Restructuring Exercise

There have been previous attempts to rein in WASA's seemingly limitless staff numbers. One such exercise was the implementation of a Voluntary Employment Separation Programme (VESP), approved by Cabinet Minute 285 of September 27, 2012, which was aimed at reducing staffing levels from 4,736 to 2,500 (approximately 50%) at an estimated cost of $367Mn. 961

employees accessed the VESP during the period 2012-2015 at an approximate cost of $300Mn. which was funded in part by an IDB Loan. Additionally, during the same period, over 2000 employees (inclusive of the 961) exited the Authority as part of an overall reduction programme[6]. Notably, five (5) years later, WASA's employee count was greater than its pre-VESP level by 415 employees, reflecting a net increase by 1,376 employees since the VESP[7]. To date, Management is unable to identify and differentiate between the employees who received VSEP packages in 2012- 2015 and those who were hired/ re-hired between 2012-2015. The VSEP was conducted in the absence of an optimal Organisation Design[8] and therefore the end result should come as no surprise.

Irregular and Unjustified Practices

A lack of accountability is deeply embedded in the culture and governance style of WASA. The Authority's aversion to a result-oriented order of business and its no-consequence environment is evident by a lack of routine performance assessments which has created an avenue for corruption. The unauthorized and sizable increase in the number of G68 level staff from 13 in the Cabinet approved structure to over 80 in the current structure, has only served to further complicate the chain of command and reduce management accountability.

2.1.5 Conclusions

- WASA's failure to perform within Regional and International best practices along with their overall inability to deliver on its mandate of delivering potable water and wastewater services to the citizens of T&T is, in part, the result of its dysfunctional Organisational Structure and poor Corporate Governance.

- WASA's current organisation structure is complex, confusing and does not support a consistent logic, causing the Authority to be dysfunctional in its entirety.

- WASA's organisation structure deviates heavily from the 1999 Cabinet Approved Structure, having evolved haphazardly into one that lacks any obvious principle of organisation.

[6] WASA Top Management Assessment, Final Report, Rawlinson Agard,2018
[7] Diagnostic Report on the State of the Water and Sewerage Authority, Ministry of Public Utilities, 2018
[8] WASA Top Management Assessment, Final Report, Rawlinson Agard,2018

- WASA's Management structure is convoluted and does not provide for effective control, supervision and accountability. The limited span of control permeates to all levels of the structure, making it impossible for the Authority to effectively manage its staff, affairs and deliver on its mandate.

- WASA's unsustainable organisation structure allows for numerous crippling management issues such as excessive organisation levels, duplication of positions and functions, structural fragmentation, lack of communication and coordination and lack of accountability across all divisions.

- WASA's futile attempts to address the plethora of intractable problems that exist in the water sector, have caused the Authority to resort to a reactive value system and clearly inefficient value system that underscores engineering and production solutions and overlooks demand management and customer satisfaction. The lack of strategic direction results in a gross misalignment of the outputs to its goals, causing the authority to consistently "miss the mark".

- WASA's disruptive "Interim Structure" arrangement, created as a means of increasing productivity, has the direct opposite effect on the Authority's Operations.

- WASA currently lacks the leadership capability and capacity to transform the organisation into a high performing public utility.

- The Board has been neglectful in fulfilling its responsibilities and lacks decisive action on numerous recommendations entrusted to them. The Board's lack of strategic focus has resulted in WASA being unable to deliver on its mandate, notwithstanding the $2Bn. Government subvention received annually.

- An organisation culture has emerged that views government subsidy as an automatic transfer of funds to meet Operating Expenditure (OPEX).

- WASA's leadership failed to successfully steer the Authority through its restructuring exercise. The then Board's lack of strategic planning resulted in the mishandling of the VESP.

- In the final analysis, WASA is an overstaffed organisation with highly paid staff who are often not held to account for sub-par performance. These sensitivities snowball toward the Minister and the rest of the Government (Cabinet and MPs) and constitute a significant reputational risk to all stakeholders.

2.2 TECHNICAL ANALYSIS

2.2.1 Water Resources

Trinidad and Tobago is not water stressed: All water originates from rainfall and eventually collects in rivers and aquifers. Figure 2 depicts the distribution of this rainfall and the location of the highest concentrations of water in both islands. The WRA and the UN's Food and Agricultural Organisation (FAO) estimates that 844,800 imperial million gallons (IMG) are available annually in both islands – 79% of this water can be found in rivers and 21% collects in aquifers[9]. The total water available equates to 0.6 IMG (2,727 m^3) of water available per person per year[10]. According to the globally established Falkenmark water stress index, T&T is not water stressed because its available freshwater exceeds 0.4 IMG (1,700 m^3) per person per year.

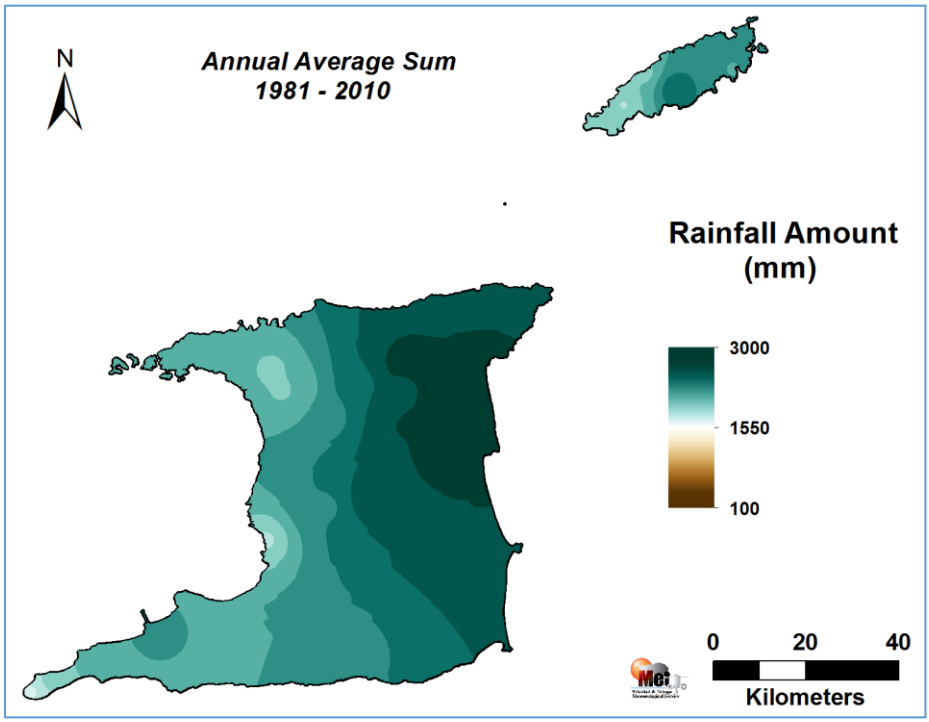


Figure 2 Distribution of Rainfall in Trinidad and Tobago from 1981 – 2010

[9] UN FAO (2017). Aquastat Database.
[10] Based on T&T's population estimate of 1.4 Mn people in 2020.

As the primary abstractor of the country's freshwater resources, WASA has a water production capacity of 243 IMG/day[11] (IMGD) which totals 88,695 IMG/year. In effect, WASA can only abstract 10% of the total water available in the country. Applying the criticality ratio developed by the Stockholm Environment Institute, T&T is not in a water scarce position since annual withdrawals are below 20-40% of water available.

While a significant volume of water is available, optimisation of this resource requires it to be harnessed and stored before it eventually flows to the sea. Additionally, as depicted in Figure 2, the bulk of this water does not coincide with the population centres of both islands, rendering bulk transmission of water an extremely important factor.

Water quality has been deteriorating: The estimates of total annual water availability do not consider water quality, which has shown consistent signs of deterioration annually. Over the past 20 years, but moreso in the past decade, the majority of Trinidad's watershed areas has been showing significant degradation (Figure 3), caused primarily by unregulated and poor land-use practices which pollute rivers - WASA's major source of supply (54%) - with chemical contaminants and heavy sedimentation. Water pollution, particularly high turbidity, after heavy rainfall events, regularly results in plant shutdown as the majority of WASA's plants are not designed to treat water with high sediment levels.

[11] WASA (2020). Presentation by Management to Cabinet Sub-Committee.

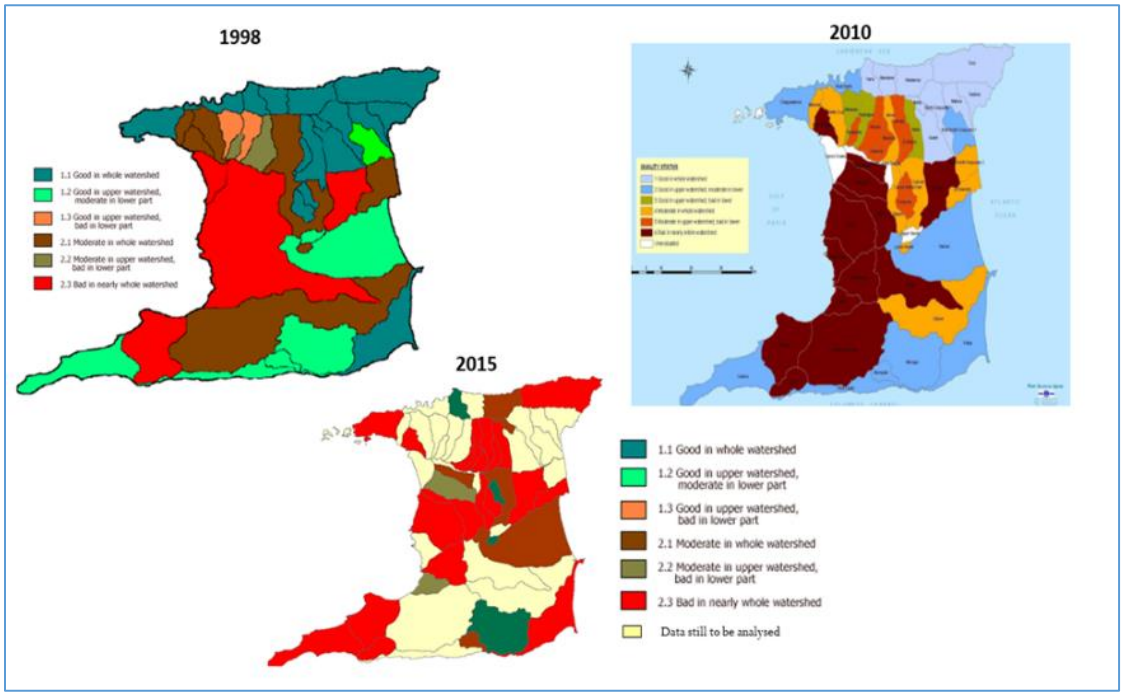


Figure 3 State of Trinidad's Watersheds from 1998 to 2015[12]

This persistent deterioration of the water environment brings land use regulation[13] under closer scrutiny and begs the question as to whether it is achieving the desired objectives.

Water For All?

There is no updated water availability and demand study for the country. This is the specific responsibility of the WRA, whose role has now been emasculated and constricted, to primarily preparing assessments of specific water supply sources as targeted by WASA, with limited proactive assessment and regulation of the country's water resources and demand. The WRA does not apply modern techniques nor use updated software, and has a limited dataset for water resource assessment. This leaves significant room for error whenever WRA conducts a yield assessment of a groundwater or surface water source, or provides scientific input in physical development plans.

Based on the most recent assessment by WRA (2019), the additional groundwater from traditional aquifers in Trinidad that can be potentially harnessed is approximately 29 MGD, according to

[12] Water Resources Agency (2016). Summary of the Adopt a River Programme.

[13] Land use regulators in T&T – Town and Country Planning Division, Environmental Management Authority, Minerals Division, Regional/Borough/City Corporations, Water and Sewerage Authority, Water Resources Agency, Drainage Division, etc.

2019 production levels and the Sustainable Yield estimates of aquifers from previous studies. On-going hydrogeological assessments by the WRA may result in the adjustment of this estimate in the future. The Committee notes, with deep concern, that WRA is not performing its role as a Resource Regulator and its incorporation into WASA, has left this important agency to flounder into insignificance within WASA.

WASA Regulates Itself

The international best practice is that the water resources regulator is separated from the water utility, and coordinates the development and management of the country's water resources and water environment to ensure sustainability and equity in the utilisation of water. The water utility is typically subject to the same regulation and enforcement as other water abstractors. This does not occur in T&T because the regulator, enforcer, and user are the same entity - WASA.

WASA is, therefore, under no obligation or accountability framework to exercise efficiency in its abstraction, production and distribution of water. The separation of functions for water resources management from water and wastewater service provision has been a recurring recommendation since 1999[14] and raised by multiple Joint Select Committees of Parliament[15].

2.2.2 Water Production

In 2019 and 2020, WASA's production averaged 218 IMGD[16] which is 10% lower than its production capacity of 243 IMGD. WASA indicates that this is due to a series of harsh dry seasons and drier than normal rainy seasons, which reduced inflows to the major impounding reservoirs and surface water intakes. While surface water accounts for the highest source of supply, WASA's desalinated purchases provides 20% of the country's potable water (Figure 4).

WASA is confident in the accuracy of these production figures as 49% of its production facilities (treatment plants, wells, intakes) are metered and portable measuring devices are used routinely for the facilities that are not[17]. The production figures are more definitive than the flows and pressures along WASA's pipeline network, which are not measured.

[14] DHV Consultants on behalf of the World Bank (1999). Water Resources Management Strategy Study.
[15] Parliament of T&T: 10th Parliament (2012). Eighth Report of the Joint Select Committee on Ministries, Statutory Authorities and State Enterprises on Water Resources Agency.
[16] WASA & Ministry of Public Utilities (2020). Factsheet for the Water Sector.
[17] WASA (2020). Responses submitted by the Management Team to questions from the Minister of Public Utilities.

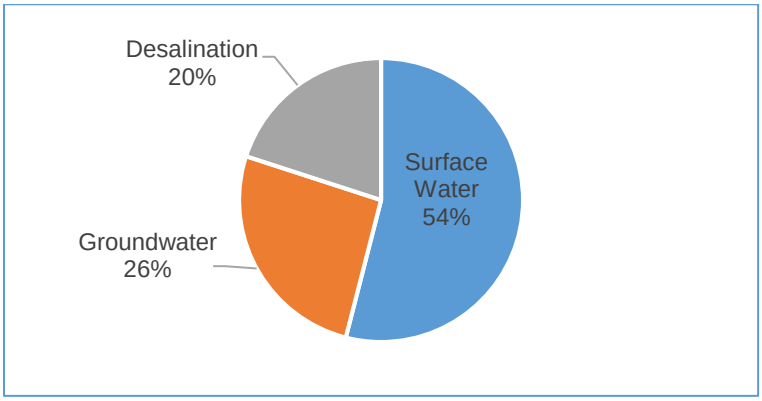


Figure 4 Breakdown of WASA's Sources of Water Supply[18]

WASA's water production, when apportioned to the population, is approximately 156 gallons/person/day. When contrasted with Jamaica's per capita water production of 65 gallons/person/day, and Barbados' estimated 66 gallons/person/day, T&T effectively produces more than twice times per citizen than both countries.

2.2.3 Desalinated Water Purchases

WASA purchases desalinated water through two (2) Water Sale Agreements that are take-or-pay contracts with separate operators as detailed in Table 3. The agreements require WASA to pay the operators in US dollars and involve a system of measuring plant output both by the operator and WASA which feeds into the invoicing system.

Table 3 Water Sale Agreements with T&T Desalination Operators

Operator	Year of Agreement	Date of Expiry	Purchase Volume	Purchase Price	Average Annual Bill[19]
Desalination Company of Trinidad & Tobago (Desalcott)[20]	1999 (original) 2012 (amended)	31st December 2036	40 IMGD (181,817 m^3/d)	US$1.00/$m^3$	US$72 Mn
Seven Seas Water Corporation[21]	2010	31st August 2027	5.6 IMGD (25,379 m^3/d)	US$1.65/$m^3$ plus electricity bill above 3.83 Kwhr/m^3	US$16 Mn

[18] WASA (2020). Presentation by the Board to the Cabinet Sub-Committee.
[19] WASA (2020). Draft Estimates of Income and Expenditure for the Financial Year 2021.
[20] WASA & Desalcott (2012). Amended Water Sale Agreement.
[21] WASA & Seven Seas Water (2015). Water Sale Agreement & Fourth Amendment.

While the initial intent of desalinated water purchases was to supply the Pt. Lisas Industrial Estate, which generates enough income at TT$12/$m^3$ (water improvement rate) for full financial recovery, the reality is that WASA has been exporting the majority of the desalinated water outside of the industrial estate. This does not apply to the Point Fortin industrial customers (Seven Seas) as they are not charged the same Water Improvement Rate as Pt. Lisas' customers.

In the case of Pt. Lisas, where WASA is significantly indebted to the Desalination Company of Trinidad and Tobago (Desalcott), only 30% (12 IMGD) of desalinated water purchases are consumed in the Estate. This is a significant decline caused by the shutdown of several major facilities from 2014 to present, where WASA previously supplied around 22 IMGD (55%) to the Pt. Lisas Estate. Effectively, the majority of expensive desalinated water is directed to domestic customers and WASA is unable to recover this cost because these customers do not pay based on volumetric consumption, but on a rate structure that is premised on an outdated property value system.

The contract between WASA and Desalcott is more burdensome for the Government than that of Seven Seas because of the higher bill from higher volumes purchased, the requirement for full payment in US Dollars, and a longer-term arrangement.

The Sub-Committee sought legal opinions from independent counsel and WASA's General Counsel and Corporate Secretary on the options available to the Government. Both have advised that WASA can extricate itself from the contractual agreement with Desalcott by exercising its right to purchase the facility. The purchase price would be in US dollars and equal to the net value of the business at the time of applicable notice to purchase as determined by an independent appraiser. This net value of the business would include:

i. The residual value which as at September 2020 and applicable to the original operations of 24 IMGD in production achieved in 2004, is US$55Mn;
ii. Amounts due from Desalcott to its suppliers and contractors; and
iii. Equity interest in the facility provided that in no event shall the Net Value of the Business be less than an amount equal to the sum of the Residual Value at the time of determination plus the costs of the appraisal and the costs and expenses related to the transfer of the Facility (including financial fees arising out of the Site Lease).[14]

There are other matters for consideration in this process of extrication, which includes an irrevocable notice of purchase, selection of the independent appraiser, timeframes for appraisal and period to pay, and testing and guaranteeing of facility reliability and performance.

In respect of the Seven Seas Agreement, there is no provision, which gives WASA the right to purchase the osmosis desalination system. In the event of termination of the Agreement, Seven Seas maintains ownership and can remove the System.

2.2.4 Non-Revenue Water

Comparing WASA's water production to both estimated and measured demand, unfolds another dynamic of the water supply conundrum, which is an imbalance between water produced, water supplied and water billed. Based on metered consumption[22] of the non-domestic sectors, WASA estimates that non-domestic demand is 42 IMGD. At an average water production of 218 IMGD, this leaves 176 IMGD for use by the domestic sector.

Based on measurements of domestic metered customers, and pilot domestic metering studies, each citizen utilises an average of 81 gallons/person/day or the equivalent of 267 gallons/household/day[23]. Figure 5 Sensitivity Analysis showing Household Consumption among Domestic Customer Categories presents a sensitivity analysis using different household consumption figures from WASA's 2020 Business Plan and other pilot studies. At water consumption rates of 81 gallons/person/day – double the World Health Organisation's (WHO) standard for reasonable consumption – the total domestic consumption of water in the country should be 113.4 IMGD.

[22] Percentage of non-domestic customers that are metered: Industrial – 82%, Commercial – 63%, Agricultural – 40%.
[23] Based on Central Statistical Office's household size of 3.3 persons.

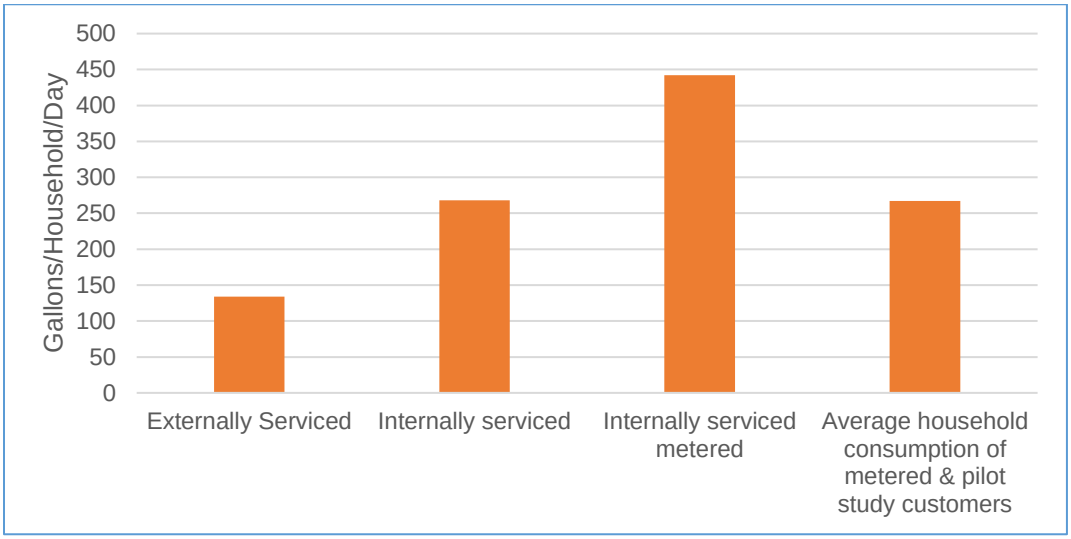


Figure 5 Sensitivity Analysis showing Household Consumption among Domestic Customer Categories[24]

Juxtaposing domestic and non-domestic consumption against water production, there is a 62.6 IMGD shortfall between the water produced and water used that cannot be accounted for (Figure 6).

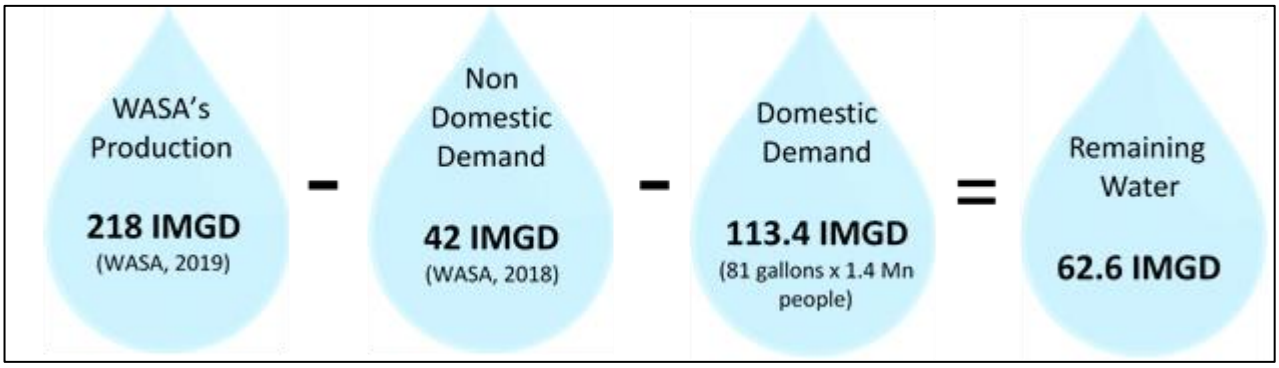


Figure 6 The Effect of Domestic and Non-Domestic Consumption on Water Production

This is the root of WASA's non-revenue water problem. This is water which WASA produces but does not receive revenue from, because it:

1. Fails to reach customers because of i) physical leaks created by a combination of poor pressure management and ageing infrastructure, and ii) illegal connections; and/or
2. Is used by customers but not accurately billed given metering errors and limited metering as a result of the tariff that is based on property value.

[24] WASA (2020). Business Plan & Price Control Proposal 2019 – 2024.

WASA is on a never-ending path with its leak repair programme as illustrated in Figure 7 below. As WASA continues to repair leaks, leaks continue to be reported suggesting that WASA may never be able to eliminate its leak backlog. WASA has a reactive leak detection system as it relies on reports from customers and operational staff patrols to identify only the leaks that have surfaced. The average monthly number of leaks reported/detected for FY 2019-2020 was 2,755.

WASA manages leak repair through an archaic job card system, which is poorly monitored and managed, and results in i) WASA's inability to account for expenditure in leak repair, ii) deficiencies in the execution of leak repair jobs, and iii) no assessment criteria for prioritising leak repair jobs given the utilisation of WASA's limited resources[25].

Figure 7 Analysis of WASA's Leak Dataset for January 2018 – June 2020 using Tableau[26]

[25] WASA (2020). Audit Report: Water Wastage/Leak Reduction Review.
[26] WASA (2020). Data Analytics of WASA's Leak Database.

In the absence of a proactive leak detection system, pre-emptive pipeline maintenance, a measured and controlled pipeline network, and a systematic approach to leak repair, WASA will continue to struggle with recurring leaks. WASA has no system to measure nor manage water flow and pressure, which is the foundation of using District Metered Areas (DMAs) to supply water, proactively detect pipeline ruptures and undertake preventative pipeline maintenance.

Key Conclusions of the Internal Audit and Compliance Department, WASA: *Report on its Water Wastage/Leak Reduction Review (Northwest Operations) - May 2020*

- The Authority has neither developed a comprehensive strategy to reduce NRW nor conducted a water balance exercise to define and quantify losses. As such, the Authority is not aware of how much water is being lost, where it's being lost and how to reduce the losses and improve performance
- Critical SOPs are either still in draft or do not adequately guide pertinent processes to ensure efficiency
- The Authority has not implemented adequate systems to monitor and manage pressure profiling activities to help reduce leaks and prolong the life of the already aged infrastructure.
- There is no asset maintenance programme to continuously improve the availability, safety, reliability and longevity of the Authority's physical assets
- Leak repair jobs are not being executed in a timely manner on account of several constraints such as finance, equipment and the logistics of working in high risk areas
- Insufficient/inferior fittings are being issued for leak repairs

WASA has established 94 out of a required 160 DMAs across the country[27]. Of this 94, only 26 (28%) are functional because meters are out of service or WASA schedules supply to the area[28]. A DMA system tied to a remote monitoring system will allow WASA to actively detect system failures and disruptions. In the absence of a modernised system, WASA will continue its reactive approach to leak repairs by relying on customer reports and field inspection of its operational staff to detect issues throughout its transmission and distribution network. Too often, WASA jumps into action to repair leaks when the issue is highlighted on Social or Traditional Media or calls made by the Executive or Members of Parliament.

[27] DMAs are geographic areas where water supply into and out of the area is isolated allowing for measurement of consumption and losses throughout the area by recording and monitoring water flows and pressure. The DMA approach to managing water supply also involves a system of appurtenances that will allow a utility to boost pressures to higher elevations or network extremities, sustain pressures where needed and reduce pressures at lower elevations.

[28] WASA (2020). Responses submitted by the Management Team to questions from the Minister of Public Utilities.

2.2.5 Water Supply

While WASA produces enough water to meet its estimate of customer demand, it still schedules supply to between 55-60% of the population[29]. This notwithstanding, the advocacy of global water utility experts, such as the International Water Association (IWA), against intermittent (scheduled) water supply networks in favour of a well-maintained continuous network as a mechanism to conserve water resources during dry and drought conditions. Some of the damaging effects of an intermittent supply are:

- Contamination of potable water due to back-pressure caused by contaminated water infiltrating leaks and cracks of pipes;[30]
- 300% increase in pipe breaks on mains and a 200% increase in pipe breaks on service connections after the supply is scheduled because of the frequent emptying and refilling of the network;[31]
- Increase in subsurface leaks since the network is not pressurised for long periods to allow leaks to surface; and
- Increase in customer consumption caused by on-site storage (tanks) to buffer the discontinuity of supply.

Water Scheduling: Who gets and Who Doesn't?

WASA does not have a standard operating procedure nor a policy of setting distribution schedules. WASA declares that these schedules are set based on (i) an imbalance between production and demand, (ii) lack of capacity of pipelines and booster stations to supply water, and (iii) inadequate storage to meet daily peaks in demand[32]. However, WASA only actively measures water at the point of output, at the production facilities, and not throughout the network nor at the customer end. Therefore, any modelling or data that drives the formulation of WASA's water supply schedules is almost entirely based on assumptions and speculations.

WASA has no proactive system to monitor any adjustments to its schedule and any unplanned disruptions can only be detected via customer complaints or roving operational staff of the

[29] WASA (2020). Presentation by Management to Cabinet Sub-Committee.
[30] Renwick, Deborah (2009). The Effects of an Intermittent Piped Water Network and Storage Practices on Household Water Quality in Tamale, Ghana.
[31] IWA Water (2011). Water Supply Networks and Pipelines: The Hidden Costs of Resorting to Intermittent Supplies.
[32] WASA (2020). Responses submitted by the Management Team to questions from the Minister of Public Utilities.

Regional Operations Control Centre. While WASA has a remote monitoring system called Supervisory Control and Data Acquisition (SCADA), its deployment is limited as presented in Table 4. It is unclear whether the SCADA and data logger systems are truly integrated into WASA's operations and to what extent the data derived inform decisions on production and scheduling.

Table 4 WASA's Deployment of Remote Monitoring System throughout its Network

Infrastructure	Number of Facilities	Number of Facilities with SCADA	Percentage SCADA Deployment[33]
Water Production Facilities	78	16	21%
Groundwater Wells	227	20	9%
Booster Stations	104	9	9%
Service Reservoirs	57	5	9%

Corruption-Laced Water Trucking Services

In the absence of a reliable water supply and in the case of planned and unplanned disruptions, WASA has a backup water trucking system with access to a fleet of 35 trucks. Of this total, 31 water trucks are contracted from external providers who source water from 20 filling stations across the country. All customers with updated accounts can qualify for WASA's water trucking service. Water truckers, both contracted and internal, are not authorised to collect payment. Unmetered domestic and non-domestic customers with accounts in good standing do not pay for WASA's truck borne water. Only metered customers are required to pay for WASA's truck-borne service through the addition of the receiving volume of water from the trucks onto their metered accounts.

WASA has set a minimum of 400 gallons/trip/customer no more than twice per week for domestic customers. For non-domestic customers, there is an approval process by the Senior Manager of Operations in the Region for specific quantities supplied. WASA's general policy is to adhere to the draft Quality of Service Standards (QSS) for Water and Wastewater Services developed by the RIC to provide customers with truck borne water within 24 hours of the request[34].

[33] Information comparison from responses submitted by WASA in October 2020 and presentation made by the Board.
[34] WASA (2018). Standard Operating Procedure: Water Trucking.

A MPU assessment of WASA's water trucking system revealed several issues that create blockages in the water trucking system which contribute to WASA's inability to meet the QSS standard[35]. These issues are:

1. The inability of the call centre to manage all customer calls/complaints which including requests for truck-borne water;
2. No alert system from the call centre database to the Water Trucking Supervisor when a request is recorded. Customers' requests are noted and scheduled by the Operations Division only after daily routine checks;
3. WASA has cited a need for 78 trucks to successfully service its clients, rather than the current 30; and
4. Corruption among WASA truck drivers and/or external truck contractors where unauthorised on-site payments are solicited, and receipts are generated for non-existent jobs. Water truckers also illegally fill at fire hydrants rather than WASA approved filling stations, and illegally sell to WASA's customers.

The Sub-Committee notes that WASA's truck borne service is inefficiently managed and, as a consequence, its operation is fraught with many problems, including lack of fit for purpose tankers, some of which are oversized and are unable to navigate narrow streets and steep hills, long queues and Call Centre challenges (see 2.4 Customer Service). This situation has rendered the service uncertain and unreliable, and has spawned the development of a thriving, parallel and illegal water trucking service, where hapless, desperate customers are willing to pay up to$400 for a truck borne water supply, the source of which in some cases cannot be verified.

2.2.6 Water Storage

WASA stores raw water in nine (9) impounding reservoirs, and treated water in 57 service reservoirs (tanks) out of an available 70. Total water storage (raw and treated) across both islands is 14,729 IMG. If there are no inflows to any of these reservoirs, the country will have less than 70 days (~2 months) of water at the current average production of 218 IMGD. WASA's total storage equates to around 10,500 gallons of water per capita[36]. In Jamaica, the dam capacity is around 400,000 gallons per capita, almost 38 times higher[37].

[35] MPU (2019). National Water Trucking Campaign: WASA's Water Trucking Operations.
[36] Based on a T&T population estimate of 1.4 Mn people
[37] FAO (2015). Aquastat Database: Dam Capacity per Capita.

There is no national assessment of household storage, which places added pressure on the network and increases customer consumption. Effectively, households with storage tanks and even with a scheduled, pressurised supply will have access to 24/7 water as the tanks refill the equivalent volumes of the days without water.

2.2.7 Wastewater

There are over 200 Wastewater Treatment Plants (WWTP) existing in the country and the wastewater market is disaggregated as depicted in Figure 8.

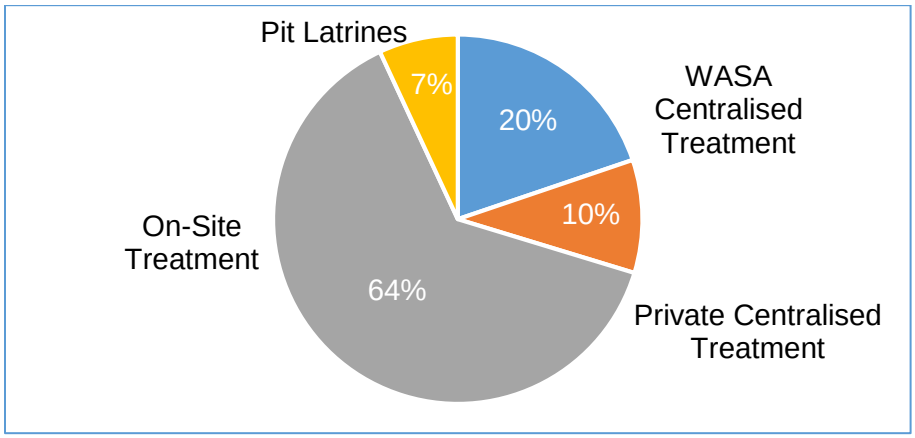


Figure 8 Wastewater Coverage across Trinidad and Tobago[38]

WASA currently operates 62 wastewater facilities (32 WWTPs and 32 lift stations) and approximately 560 km of sewer mains. WASA has also been tasked by Cabinet to takeover 72 wastewater facilities from the Housing Development Corporation (HDC)[39]. WASA has taken over 12 with an additional 19 facilities expected to be handed over in FY 2021[40]. Prior to the takeover by WASA, the HDC is required to upgrade the facilities to ensure regulatory compliance with the Water Pollution Rules, 2019 and the OSH Act. The process has been delayed as a consequence of the limited availability of funding for the HDC to undertake the expensive upgrade works required.

[38] WASA (2020)
[39] WASA (2020). Presentation by the Board to the Cabinet Sub-Committee.
[40] WASA (2020). Draft Estimates of Income and Expenditure for the Financial Year 2021.

The major wastewater plants operated by WASA perform satisfactorily, however, a large number of the private packaged plants have been abandoned or are in a dire state of disrepair resulting in effluent quality outside the permissible limit being discharged into the receiving streams.

WASA services around 20% of the population with centralised wastewater facilities, with an additional 10% being serviced by privately operated facilities. The remaining 70% are serviced by on-lot systems, mainly septic tanks/soakaways.

Capital Investment

Capital investment in the sewerage sector has been very sporadic and limited. The major wastewater schemes built by WASA occurred in the 1960s when Lock-Joint under the direction of Metcalf and Eddy constructed the three main wastewater systems to serve Port of Spain, Arima and San Fernando. In the early 1990s the Scarborough WWTP was constructed, followed by the New Beetham WWTP in 2004.

Between 2011 and 2014, two (2) Loan Agreements were signed with the IDB, (*Loan 2600/OC-TT WASA Modernization And Wastewater Infrastructure Rehabilitation* and *Loan 2890/OC-TT Multi-Phase Wastewater Rehabilitation Programme Phase 1)* to address centralized wastewater services in the Malabar and San Fernando catchments over an eight (8) year horizon. Phase 1 works focus on the construction of the regional WWTP and trunk sewers and the remaining phases focus on expanding the wastewater network and providing sewer service connections to the full catchments in Malabar and San Fernando. When both programmes are fully completed in 2021, centralized wastewater coverage will move from 30% to 44%[41].

Upgrade works are also taking place at the Trincity WWTP to accommodate the existing developments within the Trincity Catchment. Detailed designs have commenced for a new Maloney WWTP and an associated collection system to accommodate developments within the Maloney Catchment, these design services are scheduled to be completed by September 2021

[41] The Phase 1 works under the Malabar Project was completed in December 2018. The Phase 1 works at San Fernando are expected to be completed by the third quarter of 2021

While, according to statute, WASA holds legal responsibility for development and maintenance of wastewater systems across the country, there is a nationwide problem of abandoned private wastewater facilities spewing untreated wastewater into natural watercourses. Apart from serious public health consequences, this water pollution affects raw water quality at WASA's surface water intakes requiring more advanced treatment processes. This is particularly the case in the Caroni River Basin, the largest source of supply in Trinidad.

Wastewater Development Plan

WASA has prepared a comprehensive Wastewater Development Plan 2020-2025 that requires a capital investment of almost $900Mn to address, *inter alia*, the following:

- Construction of regional wastewater system(s) to service catchments, simultaneously expanding and integrating existing wastewater systems and decommissioning of existing wastewater plants and pumping stations in Malabar, San Fernando, Trincity, Beetham (Sludge Management System);
- Preparation of detailed designs and tender documents for the Maloney WWTP and Collection System and Wastewater Systems in Chaguanas, Couva, Bamboo-Valsayn;
- Upgrade, expansion and maintenance of wastewater assets – Mount Hope Lift Station, Scarborough, South West, Tobago, Arima, Debe, North-West Trinidad, Greater Port of Spain and environs, Palmiste;
- Refurbishment of Wastewater Facilities – including Techier Village, Scarborough, Orchard Gardens, Central Park, Frederick Settlement, Real Spring, Lange Park, Couva; and
- Adoption of WWTPs in North and South Trinidad and Tobago.

2.2.8 Capital Works – Another Area of Failure

WASA has no demonstrated capacity to manage capital projects and utilise funding allocated through the Government's PSIP. From 2010 to 2020, the Government allocated $3.65Bn to WASA to finance water and wastewater projects. Of this amount, WASA utilised only approximately $2.1Bn, an execution rate of 59%. In addition to the annual subvention for recurrent costs totalling $21.6Bn for the same period, the burning question is whether the development impact of this expenditure in the water sector has materialised in any way.

The evidence points invariably to an inverse relationship between the Government's financing of capital and operating costs for WASA and WASA's performance, particularly as it relates to servicing the population with a continuous water supply, and its responsiveness to basic customer issues. WASA has consistently demonstrated its inability to successfully align the sequencing of these PSIP projects into a more comprehensive strategy of increasing 24/7 water supply and increasing wastewater coverage across the country.

Figure 9 illustrates WASA's 10-year track record of expenditure against allocation which is somewhat skewed by a parallel project implementation system for the two (2) IDB-financed wastewater programmes that began in 2014 and will end in 2021.

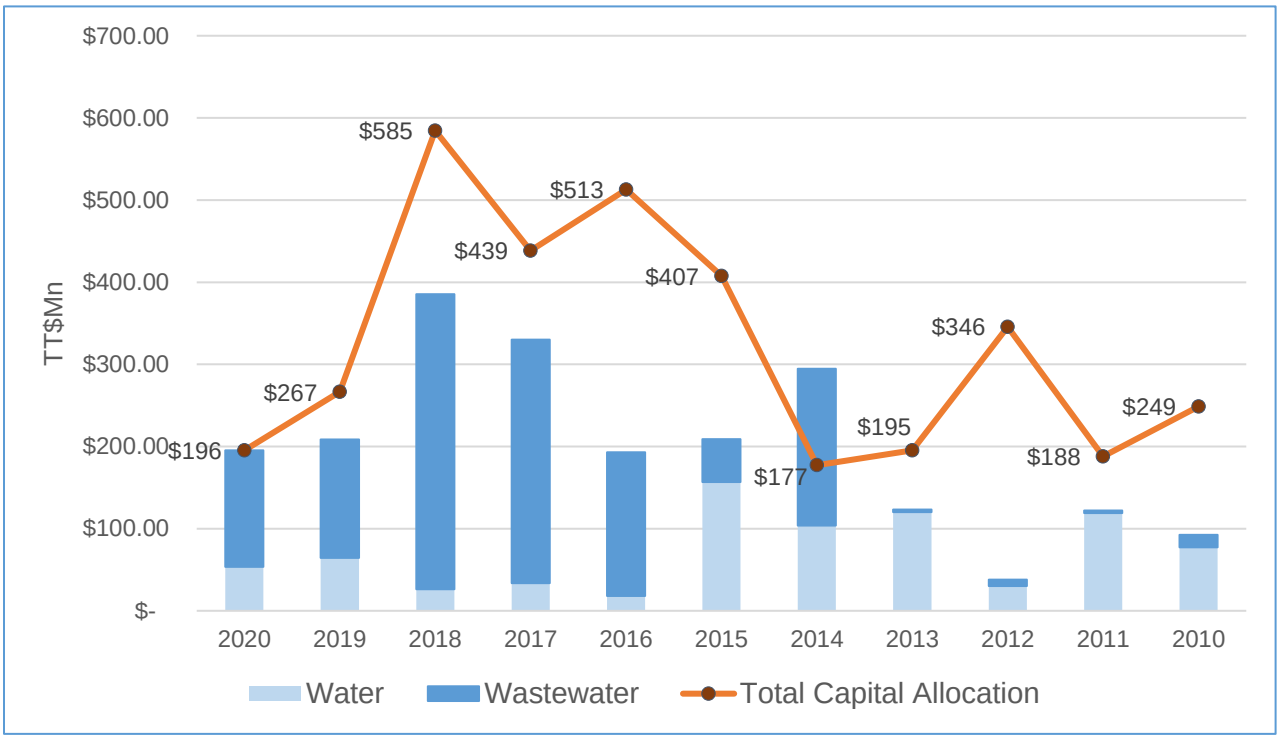


Figure 9 Capital (PSIP) Investment in WASA against WASA's Actual Expenditure (2010 – 2020)[42]

A total of $17Mn.[43] of the $2.1Bn. received by the Authority remains unspent and held in a WASA Bank Account with no commitments attached. These unspent balances have accumulated under

[42] Ministry of Finance (2012-2020). Draft Estimates of Development Programme for Financial Years 2012 – 2020.
[43] As at October 31, 2020. The unspent balances was reported by WASA as being in excess of $60 million in May 2020.

various projects over the years and are a manifestation of WASA's convoluted system of project management, project accounting and payments to contractors/suppliers.

WASA's Programmes and Change Management (PCM) Division is the delivery unit for the projects funded by the PSIP. Approximately 282 of the 415 members of staff (68%) are directly responsible for the implementation of these projects. In reality, the PCM staff undertake the project management function, while actual execution is contracted out.

PCM's track record is poor. There have been numerous delays in the implementation of projects, resulting in the continuous revision of projected completion dates. Nearly 59% of WASA's Current Projects began in FY 2017 or earlier.

Table 5 Age of PSIP Projects in Current Portfolio

No	PSIP Projects	Estimated Start Date
1	Desilting and Rehabilitation of the Hillsborough Dam, Tobago	**Prior to 2010**
2	Rehabilitation of Mount Hope Lift Station	**2012**
3	Upgrade of Charlotteville Intake	**2012**
4	Rehabilitation of Scarborough WWTP	**2012**
5	Wastewater Network Expansion	**2013**
6	Upgrade of Transmission Network Tobago (Reactivated)	**2014**
7	Construction of Avocat Wells (Pipeline)	**2015**
8	Multi-Phase Wastewater Rehabilitation Programme - Phase 1	**2016**
9	Upgrade of the Maloney Water Treatment Plant	**2016**
10	Upgrade of Carlsen Field Water Treatment Plant	**2016**
11	Design and installation of Guanapo Service Reservoir	**2016**
12	Design and Construction of Quare Service Reservoir	**2016**

No	PSIP Projects	Estimated Start Date
13	Upgrade of Distribution System, Tobago	**2015**
14	Construction of sewer mains - Morne Coco Road, Diego Martin	**2017**
15	Water Supply to Labidco and Union Industrial Estate	**2017**
16	Tobago Well Development	**2017**
17	Construction of Calvary Hill Booster Station	**2017**
	Projects from 2018 Forward Not Considered to be Legacy Projects	
18	Arouca Well Development (No. 8, 9 &10)	**2018**
19	Moruga Well Development	**2019**
20	Development of New Water Sources Phase 1 - Maraval and Environs	**2019**
21	Integrated Water Improvement Programme- North West Trinidad	**2019**
22	Community Water Improvement Programme (FY 18/19 & FY 19/20)	**2019**
23	Well Development Programme	**2019**
24	Pipeline Relocation for Ministry of Works and Transport Bridge Reconstruction Programme (FY 19/20)	**2019**
25	Non-revenue Water Reduction Programme	**2019**
26	Refurbishment Works at Caroni Water Treatment Plant **(New)**	**2020**
27	Upgrade of Petrotrin Guayguayare Water Treatment Plant Phase 3 **(New)**	**2020**
28	Rehabilitation of the Ultraviolet Contact Tank at the Beetham WWTP **(New)**	**2020**
29	Calvary Tank and Transmission Pipeline **(New)**	**2020**

Additionally, changes in the scope of projects and flawed specifications on equipment as well as cost overruns have stymied progress on key projects.

The lack of robust project management systems coupled with delays in the release of funds by the Ministry of Finance (MOF) have severely impacted the Authority's achievement of targeted deliverables under the PSIP. The most striking example of WASA's project management system deficiencies is the desilting of the Hillsborough Dam, which has been ongoing since 2009. Only in 2019 did WASA commence enabling works which were concluded in October 2020, while the desilting works are scheduled to commence by end of November 2020. Even for projects that are standard procurement such as purchasing backhoes and dump trucks to resource the leak repair team, or purchasing bulk meters, WASA's delivery timeframe is an astonishing 2-3 years.

Fundamentally, every aspect of the project management cycle, from project conceptualization to the closeout of projects is plagued with inefficiencies as identified hereunder:

Poor Project Conceptualization, Design, Planning

The pre-planning phase of the project cycle is often deficient. Preliminary activities related to land acquisition and statutory approvals remain ongoing for critical projects including Tobago Well Development and Well Development Programmes.

Persistent scope revisions and shifting timelines are indicative of a lack of readiness to implement. The Distribution and Transmission Networks Projects in Tobago have been in the process of re-scoping for the past 12 months with no progress being reported.

Internal factors such as the institutional capacity to execute projects as well as external factors such as the current economic environment are not given due consideration in conceptualizing and planning of projects. Moreover, planning is, at times, deficient as evidenced by the estimate for the Desilting of the Hillsborough Dam did not include required works on Easterfield Roadway to facilitate the transport of the silt to another location.

A Cumbersome Tendering and Contracting Process

The Authority has a sluggish procurement process and a tendency to continuously cancel and re-invite tenders due at times to a lack of due diligence in defining scope/specifications and

conducting tender evaluations. This process does not always derive value-for-money benefits or quality work. This is often exacerbated by slow and bureaucratic decision making, even in instances where priority initiatives are being addressed.

The Well Development Programme and Water Supply to the La Brea Industrial Development Company Limited (Labidco) Project have been particularly affected by procurement challenges, resulting in a wastage of time and resources, and a challenge to successful implementation. Procurement issues have also affected projects like the NRW Reduction Programme, where numerous delays were experienced in the acquisition of Dump Trucks and Backhoes. In the case of the acquisition of bulk meters, the MPU gave its non-objection to the utilization of funding under the IDB Loan 2890 for the purchase in October 2018 but the meters were only actually delivered to the Authority in July and November 2020.

Deficiencies in Contract/Contractor Supervision

A lack of due diligence resulted in the award of a contract for the construction of the San Fernando WWTP, despite the bid price being less than the engineer's estimate. In addition, the Authority's poor monitoring of the supervision contractor has resulted in ineffective project supervision which has, in turn, affected the timely completion of deliverables. Robust project control systems were not initiated to address project slippages. The Maloney Water Treatment Plant (WTP) and the Integrated Water Improvement Programme (IWIP) are also examples of projects that are behind schedule, despite WASA's assurances of timely completion.

Poor Project Execution and Control of Projects Implemented Internally

The Community Water Improvement Programme (CWIP), which is internally implemented by WASA, encountered many revised projected completion dates. Several projects were delayed due to lengthy procurement processes and long outstanding road restoration works.

Inadequate/Lethargic Submission of Documentation to Facilitate Requests for Releases for Projects funded under the Consolidated Fund

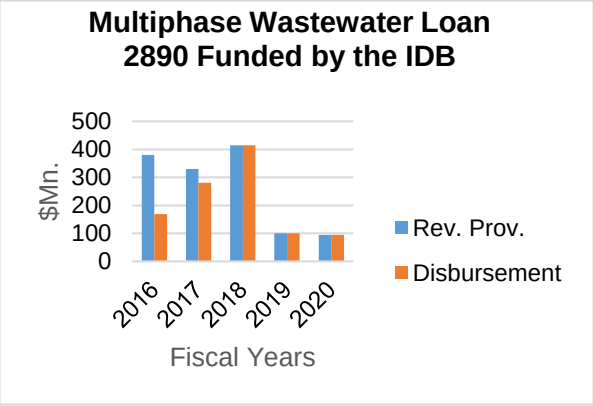
During FY 2020, WASA submitted incomplete documentation to the MPU for the 1st and 2nd quarter request for releases. The 3rd quarter request was only submitted in the first week of the 4th quarter. The Well Development Programme was particularly affected by this late submission.

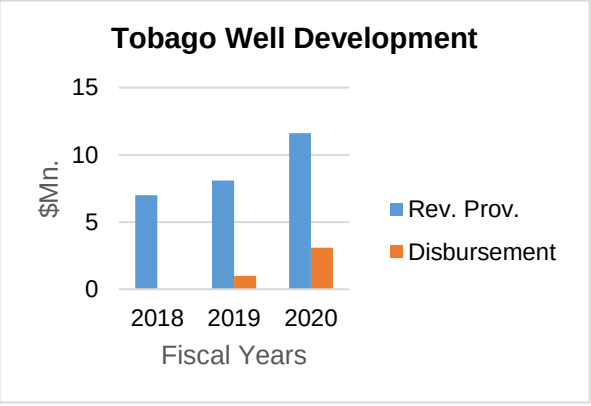
Poor Project Accounting and Payments System

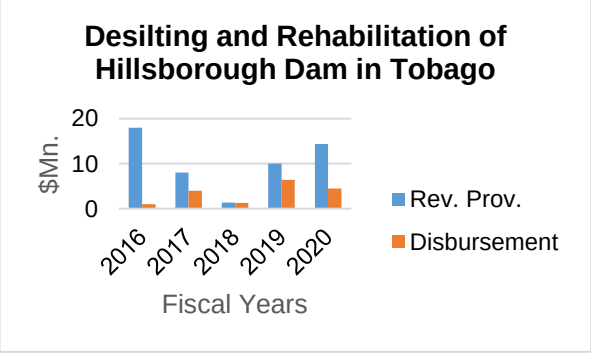
Poor project accounting coupled with cash management issues has resulted in project delays and stoppages. Works on the Rehabilitation of the Scarborough WWTP was completed two (2) years behind schedule due to the Authority's inability to settle a long outstanding payment issue with contractor. The project is now in its defects liability period.

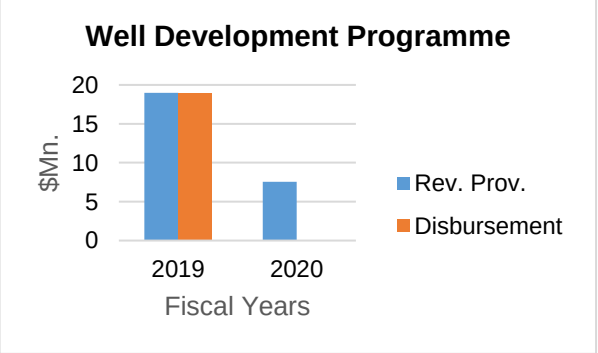
Further, there are several instances where works/services have been delivered under Projects but payments have not been made due to the PCM's failure to process invoices in a timely manner. External providers are often unwilling to work for WASA and/or inflating their bids as an unofficial interest payment to compensate for WASA's history of delayed or non-payment for services and goods. Project implementation also suffers on account of the cash flow issues faced by contractors who, to a large extent, rely on WASA projects to survive which goes against procurement best practice.

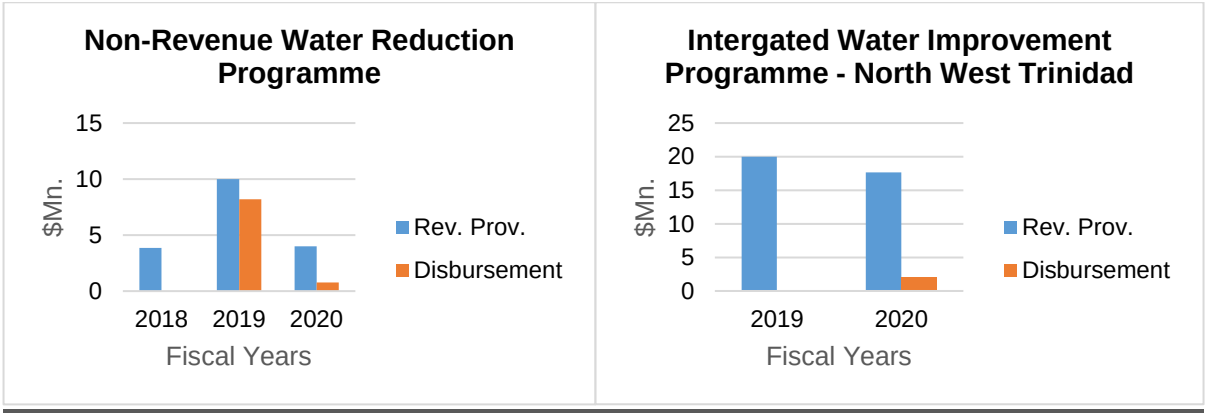
The following graphs illustrate WASA's utilization of funds for the implementation of key projects:











Note: Rev. Prov. is Allocation +/- any Transfers/Virements.

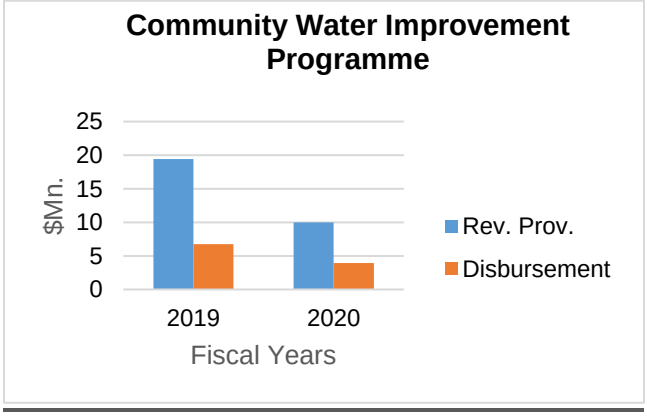


Figure 10 Allocation of WASA's Funds to Key Projects

Note: Rev. Prov. is Allocation +/- any Transfers/Virements.

Other divisions within WASA, specifically, Procurement, Operations, Finance and Legal also provide supporting roles in the execution of projects. Notwithstanding, the PCM Division assigns responsibility to a project manager who must champion the project through all stages of the project cycle, obtaining the support of WASA's other divisions as the project moves forward.

There is no formal system of collaboration among WASA's PCM, Operations Division and WRA in planning, implementing and handing over of WASA's capital projects. Discussions with these departments reveal the following:

- Projects do not always address the priority problem areas as identified by the Operations Division;
- Even though the Operations Division is the end-user of capital infrastructure works, there is limited involvement and oversight by the Operations Division in planning and execution;

- The Operations Division executes its own internally funded capital improvement projects which are separate from the PSIP and PCM Division, and the improvements are not always integrated or updated in WASA's plans and models. This parallel system of executing capital works results in competition for scarce resources such as backhoes and dump trucks, and duplication of efforts; and
- Each division generates reports, plans and assessments that are often in isolation of the views, perspectives and analysis of other divisions.

Road Restoration

One of the population's most vexing complaints against WASA continues to be the timeliness and quality of road restoration works. WASA's high level of pipeline leaks (2,755 leaks per month) forces the Authority to undertake excavation works on road and drainage infrastructure daily. While a standard operating procedure (SOP) [44] has been developed by WASA and the MOWT as a means of ensuring the quality of road repairs for which WASA is responsible, restoration work is more often than not sub-standard with adverse consequences for road users.

Currently, road and leak repairs are performed by the Authority's ten (10) road restoration crews and 49 pipeline repair crews. Contractors are mainly used to perform permanent road restoration in pipe laying projects and to provide heavy equipment.

2.2.9 Conclusions

- **Management of water resources** and the water environment is virtually absent, thereby compromising the sustainability and efficient use of the country's water supplies. Lack of independent water resources regulation and prominence of land-use practices that degrade watersheds threaten the ability of the country to provide water for future generations and withdraw from expensive desalination production. This situation is worsened in the face of climate change and climate variability.

- The contractual arrangements between WASA and the **desalination operators** favour the private sector entities primarily because (i) the operators are paid in full in US$, and (ii)

[44] Guided by the RIC's Guaranteed and Overall Water Standards and the MOWT guidelines for road repair works.

WASA entered and amended these arrangements without ring-fencing supply for industrial users (who can pay for this water). Now, the majority of the USD desalinated water flows to domestic customers and WASA cannot recover its desalination purchases with the existing tariff structure.

- WASA has no system to manage and measure the **supply/distribution of water,** and modern technical competencies, tools, systems and technology are completely absent from its operations. WASA has created an operational system that is fully reliant on people who know the system/network and which is highly susceptible to sabotage, incompetence and mismanagement. This has the following repercussions:
    - No accountability by WASA in complying and adhering to the water supply schedules;
    - A predominantly manual system of detecting and addressing network and other system failures;
    - Wastage of water by WASA (never-ending leak repair) and customers; and
    - Extreme difficulty in obtaining data and information to arrive at a practical and cost-effective solution to the water supply problem.

- With the possible exception of the production data, **WASA's data** cannot be relied upon to make robust policy and investment decisions. NRW has been estimated at between 40%-60% by various studies since 2000, but these estimates have not been substantiated with the relevant measurement data. However, while the actual level of water loss is debatable, the fact is that WASA is operating with a porous network (as evidenced by a monthly average of 2,755 detected/reported leaks) which is due in part to aged pipelines but more so because of the sub-optimal practices employed by WASA in managing (pressure management and scheduling) the flows within the network.

- **Water storage** is significantly under what should be reasonably required. This poses a national threat to both water and national security in the event of a major drought or dry event. WASA's inability to manage the normal seasonal changes (wet and dry seasons) in water supply, signals its gross inability to manage any extreme changes in water availability. WASA and the country continue to miss opportunities to harness and store water during high rainfall and flood events.

- **The Wastewater Sector** has been neglected. The sizeable investments made over the past decade through two (2) IDB Loans have focussed on the important catchment areas of Arima and San Fernando. However, there remains a significant deficit in terms of the servicing of Central Trinidad (Chaguanas, Couva) in particular, but also Trincity, Maloney and Valsayn. Furthermore, many wastewater facilities/assets across both islands are in dire need of upgrade/expansion/maintenance.

- WASA's PCM is completely void of the productive capacity to execute **capital works** because it is unable to coordinate or collaborate within and outside of the entity and lacks the project management systems. The outcome of this flawed and slow system is the ineffective use of scarce financial resources and delayed/missed development impact from critical infrastructure upgrades. The Committee does not recommend that any additional development funding be directed to the PCM for planning and executing urgent and strategic capital projects. Instead, it is imperative that as a matter of priority, these projects are ring-fenced for implementation under special executing and project management arrangements.

- Despite the provision of substantial amounts of **capital funding** over the past decade, the service provided to the citizenry has deteriorated. A review and reordering of priority investments is now critical to ensure complementarity with the objective of improving the level and reliability of service in areas that now have a less than adequate supply of water.

- The **Unspent Balances** amounting to $17Mn. being held by the Authority must be immediately re-directed through a Cabinet decision to complete new/existing priority projects to improve the water supply to underserved communities.

2.3 FINANCIAL ANALYSIS

2.3.1 Income and Expenditure

Pivotal to the efficiency and growth of the water sector is its **revenue-generation** capacity. During the 2016 to 2020 period, the Authority generated revenue of approximately $770Mn. annually (Table 6). This outcome was owned in large measure to water purchases by industries in the Pt. Lisas Industrial Estate. With the closure of several plants (e.g. Arcelor Mittal, Centrin and Methanol Holdings Trinidad Limited) during the last five years, and particularly during 2020 with the onset of COVID-19, the decline to $708.9Mn. in FY 2020 was not entirely unexpected.

Table 6 Income & Expenditure for Fiscal Years 2016-2020

FISCAL YEAR	INCOME (TT$)	EXPENDITURE (TT$)	DEFICIT (TT$)
2015/16	791,896,657	2,501,201,972	(1,709,305,316)
2016/17	724,117,263	2,585,694,795	(1,861,577,532)
2017/18	833,799,147	2,582,590,485	(1,748,791,338)
2018/19	781,063,675	2,685,060,575	(1,903,996,900)
2019/20	708,851,984	2,746,713,805	(2,037,861,821)

Source: Management Accounts FYs 2016-2020

For every year during the same 5-year period, the Authority's expenditure exceeded $2.5Bn. (Table 6). This consistently increasing disparity between income and expenditure has resulted in deficits more than twice the generated revenue with the concomitant reliance on Government for financial support.

Obsolete Tariff Structure

Citizens of Trinidad and Tobago have been paying a water rate of US$0.27 per cubic metre since 1993. A comparison of rates paid in 39 countries in North, Central, and South America, as well as the Caribbean indicate that Trinidad and Tobago has the fourth lowest rate, with only Peru, Venezuela and Nicaragua, in that order, having lower rates. (Figure 11).

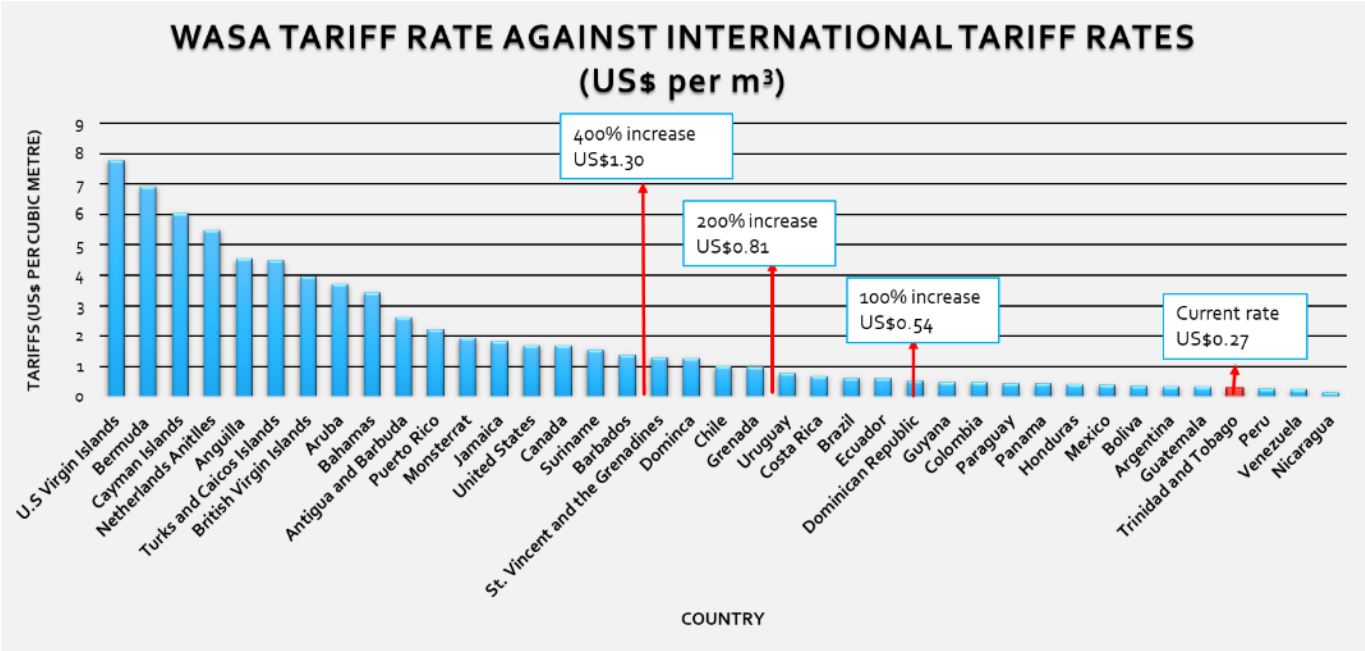


Figure 11 Comparison of WASA's Tariff Rate against International Tariff Rates (2018)

Expenditure Profile

Salaries alone represent over 100% of Revenues, with Wages representing almost 50%, on average (Table 7). Together, Wages and Salaries consistently represent over 45**%** of the expenditure of the Authority.

The expenditure on Desalinated Water is also significant particularly as this obligation has to be met in US dollars. Based on the Amended Water Sale Agreement between WASA and Desalcott, the Authority has agreed to pay US$1.00/cm for an output level of at least 40 IMGD. This translates into an average monthly payment of US$6.0Mn. or US$72Mn. per annum. There is a US$60Mn. Facility currently in place with Republic Bank Limited to facilitate payments for desalinated water, which is due to expire on November 27 2020, but the MOF has requested an extension to December 31, 2020.

Table 7 Profile of the Main Expenditure Items for Fiscal Years 2016-2020

FISCAL YEAR	SALARIES % of REVENUE	WAGES % of REVENUE	DESAL WATER % of REVENUE	SALARIES % of EXPENDITURE	WAGES % of EXPENDITURE	WAGES & SALARIES % of EXPENDITURE
2016	115	48	N.A.	39.0	16.4	**55.4**
2017	123	48	73	34.4	13.5	**47.9**
2018	125	50	73	34.6	13.8	**48.4**
2019	115	45	68	33.4	13.0	**46.4**
2020	128	49	74	33.0	12.6	**45.6**

Source: Management Accounts FYs 2016-2020

As part of its role as a service provider, WASA is required to make an annual CESS payment to the RIC. The payment for FY 2018 in the amount of $2.347Mn. was paid in July 2020. The RIC is yet to invoice WASA for FY2019 and FY 2020.

Cost Reduction Initiatives

Mindful of the unsustainability of its expenditure patterns, the Authority commenced several cost reduction initiatives in January 2016 which had resulted in savings of **$64.7Mn** by the end of September 2019.

The cost reduction initiatives included, but were not limited to:

- Bulk purchases and the implementation of e-Auctions for cost reductions in the cost of materials, chemicals, aggregates, equipment, spares and high demand inventory items;
- Reduction in Overtime from the implementation of a Shift System and the Rotation of Supervisors;
- Use of technology e.g. SharePoint to reduce printing and stationery costs for Board Meetings;
- Utilization of in-house facilitators for Seminars and Training;
- Limiting inter-island travel to same-day travel;

- Use of Social Media handles for marketing and promotional advertising; and
- Re-negotiation of lease arrangements for vehicles and property.

The Committee was particularly concerned about two (2) areas identified for cost savings and, undertook a more detailed examination of WASA's expenditures over the period to determine the extent to which the touted success had actually been achieved.

(i) **Reduction in Overtime from the Implementation of a Shift System and the Rotation of Supervisors**

Having acknowledged that "one major area in which management controls are urgently required is the area of "Overtime"; and that "Overtime related cost contributes to the Authority's inability to fulfil its financial obligations on a monthly basis"; the Authority formed an Overtime Management Committee in May 2016. This is five (5) months after the January 2016 initiative to reduce overtime was implemented. The Committee's report titled *"Report on Overtime Reduction Strategies within the Water and Sewerage Authority"* was produced on February 3, 2017 some nine (9) months after its formation. The Overtime Committee comprised the following persons:

- Chief Executive Officer (Ag.);
- Director, Human Resources (Ag.);
- Director, Finance (Ag.);
- Director, Corporate Services (Ag.);
- Director, Programmes & Change Management (Ag.); and
- Director, Operations (Ag.).

The mandate of the Overtime Committee included: (i)the analysis of historic data on overtime levels in order to identify trends and patterns; (ii)the formulation of appropriate strategies to reduce cost over a period of time; and (iii) a commitment to the implementation of the agreed strategies within the established timeframe.

As a demonstration of their commitment to the task, the Overtime Committee agreed that for FY 2017 the Overtime for monthly paid staff (commuted) would be $25,471,365 while the Overtime for Daily-rated staff would be in the vicinity of $20,069,934. The actual figures for FY 2017 as recorded in Table 8 below, presented a significantly different outturn than what was proposed,

with overtime for daily-paid employees reaching $39.2-Mn and commuted overtime recording a high of $51.0Mn. In both cases, the actual was approximately 100% more than projected. Between 2016 and 2020, the Authority expended $207,469,234 on overtime for its daily paid employees and $260,928,512 (commuted) for its monthly paid staff, for a total of $468,397,746 or an average of approximately $94Mn. annually.

Table 8 Overtime Expenditure for Fiscal Years 2016-2020

FISCAL YEAR	OVERTIME (Daily-Paid) (TT$)	OVERTIME (Monthly) As Worked (TT$)	OVERTIME (Monthly) Commuted (TT$)
2016	41,181,674	35,905,827	48,602,420
2017	39,216,759	35,134,618	51,013,590
2018	42,897,508	38,800,583	52,276,212
2019	42,296,213	38,224,188	54,927,146
2020	41,877,080	43,788,898	54,109,444

Source: Management Accounts FYs 2016- 2020

(ii) **Renegotiation of Lease Arrangements for Vehicles**

Further to the Government's mandate in 2016 for Ministries and Agencies to reduce expenditure by 7%, the Authority took steps to return 100 leased vehicles to their suppliers, leaving a fleet of 301 vehicles.

The impact of the decision is shown in Table 9 below, where a decline in rental costs is recorded in the fiscal accounts for 2017 and 2018. The data also record an uptick since FY 2018 resulting in a 38.3% increase in rental cost between FY 2018 and FY 2020, on account of increased rental costs for pick-up and 3-ton trucks.

Table 9 Vehicle Rentals for Fiscal Years 2016-2020

FISCAL YEAR	VEHICLE RENTAL (TT$)
2016	36,689,990
2017	26,404,302
2018	22,690,946
2019	25,560,277
2020	31,483,074

Source: Management Accounts FYs 2016-2020

What is clear is that neither of the two cost-reduction initiatives yielded the anticipated or desired results.

New Cost-Reduction Initiatives

The Authority has indicated that it has introduced new cost-reduction initiatives in the areas of security, electricity, repairs and maintenance, major equipment rental, and travelling and subsistence allowances. The Authority's view, however, is that the efficacy of these initiatives would be enhanced by (i) a review of the Business Model, (ii) a review and redesign of the Organisational Structure and staffing levels, and (iii) an assessment of the major cost drivers such as Emoluments, Desalinated Water Purchases and Electricity.

Government Subventions

The statistics in Table 10 show that over the last five (5) years, Government Subventions have been the primary source of funding for WASA's expenditure, particularly personnel expenditure where most of the funds have been applied. However, there has been a downward trajectory due to the Government's strained economic circumstances occasioned by vagaries in the international oil and gas markets. Government's expenditure to WASA has in fact decreased from a high of $2.1 Bn in 2016 to $1.4 Bn in 2020. The Authority is now challenged to intentionally implement mechanisms already in place to concomitantly raise revenue and curb expenditure.

Table 10 Total Expenditure VS Government Subventions

FISCAL YEAR	2016	2017	2018	2019	2020
Total Expenditure (TT$)	2,501,201,972	2,585,694,795	2,582,590,485	2,685,060,575	2,746,713,805
Government Subventions (TT$)	2,150,000,000	1,858,222,027	1,804,136,048	1,773,433,608	1,420,6236,556
GS/TE (%)	**85.9**	**71.9**	**69.8**	**67.2**	**64.2**

Source: Management Accounts FYs 2016-2020

In a bid to finance expenditure not covered by the Subventions and operational income, the Authority resorted to its overdraft facility of $420Mn, which was arranged with RBC Royal Bank Limited for the period March 2017 to October 2020. This facility carried a fixed interest rate of 3.01% per annum plus a default rate of 2.0% per annum. During FY 2020, the facility was fully drawn but the Authority successfully applied to the Bank for authorisation to exceed the limit on a monthly basis. On receipt of subventions in the ensuing month, the excess was repaid and the cycle continued.

The overdraft facility of $420Mn. was repaid on October 28, 2020, by way of a loan facility with Republic Bank Limited. A new overdraft facility was executed with RBC Royal Bank Limited on November 9, 2020, for $200 Mn. This is a 5-year facility with an interest rate of 3.75% in the first year to be reset annually in accordance with agreed terms and conditions.

Analysis of Receivables

Table 11 presents the Authority's Accounts Receivable for the 2016-2020 period showing growth from $328.6Mn. in FY 2016 to $467.2Mn. at the end of FY 2020.

Table 11 Accounts Receivables for Fiscal Years 2016-2020

FISCAL YEAR	ACCOUNTS RECEIVABLE (TT$)
2015/2016	328,604,566
2016/2017	398,878,036
2017/2018	456,237,363
2018/2019	438,446,703
2019/2020	467,200,833

Source: Management Accounts FYs 2016-2020

The Management Accounts reveal, however, that these figures do not represent the actual accounts receivable for the Authority, in that significant allowances, have been made for doubtful debts or debts that the Authority considers uncollectible. At the end of FY 2020, for instance, barring any allowances for doubtful debts, the actual accounts receivable, exclusive of VAT refunds, was $823Mn.

Additionally, the Government and its Agencies are responsible for $99.0Mn. in receivables to the Authority as at the end of FY 2020. The main debtors to the Authority are:

Housing Development Corporation	**$33,369,365.83**
Ministry of Education	**$13,237,437.36**
Ministry of Public Administration	**$8,156,465.31 (of which Caroni (1975) Limited owes $6,043,494.97)**
Ministry of National Security	**$7,716,895.72**
Ministry of Health	**$7,687,177.97**

WASA's customer database and collection efficiency must be urgently improved. In a recent study by Castalia,[45] the collection rate was estimated at 85%[46] in 2017. As part of the same study, collection efficiency was assessed using the ratio of accounts receivable net of provisions for

[45]CASTALIA (2017); CASTALIA, Benchmarking study prepared for the Business Plan and Price Control Proposal for WASA: 2019-2024 (July 2019) - estimates the accounts receivables days at 56

[46] Includes arrears collected from previous billing cycles

doubtful accounts to revenue. The conclusion was that for the benchmarked utilities, it took an average of about 80 days to collect amounts billed to customers, with several taking well over 100 days. In the case of WASA, it took 188 days to collect amounts billed to customers.

The general view was that this result may be due to (i) lack of a clear *suspension of service policy* due to non-payment, which may be linked to the unmetered water supply; and (ii) an inaccurate customer cadastre, as the specifics of customers are often unknown or require updating. The Authority did, however, provide the Committee with a list of strategies it has undertaken to alleviate this situation.

The strategies involve a two-pronged approach, namely, (a) encouragement and (b) enforcement. In terms of encouragement, the following strategies have been employed:

- Distribution of mass reminder and disconnection notices to residential and commercial customers owing more than two billing periods;
- Reminder telephone calls to delinquent customers whose accounts are in arrears of two billing periods and more; and SMS reminder messages to residential customers;
- Conducting regular meetings/discussions with CEOs /Permanent Secretaries/Heads of State Enterprises in the Public Sector and Government Agencies;
- Notification through public announcements in eight (8) areas with highest receivables; and
- Communication to the public through the “Stay Connected” campaign, where forty-five (45) social media posts were published and eight (8) videos were produced to persuade customers to make a bill payment.

With respect to enforcement, the Authority has implemented the following:

- The engagement of a debt collector with a specific target assignment of $50.5 Mn in receivables. To date, a total of $38,524.39 has been collected;
- Legal Action. WASA has initiated the sale of property actions against customers for non-payment of bills in circumstances where all previous actions were exhausted. Forty-four (44) pre-action protocol letters to customers with total receivables of $1.33 Mn. were issued. The results to date are as follows:
    - Eighteen (18) customers made full payments valued at $484,909.15

- Eight (8) agreements were made valued at $63,735.00
- Nine (9) part-payments were made valued at $65,400.00
- Eight (8) properties are to proceed with the sale; and

- Disconnection (493 in 2018, 533 in 2019 and 153 in 2020).[47]

Analysis of Payables

Accounts payable have been steadily increasing due, in part, to increasing debt serving requirements, consistent with increased borrowings by the Authority (Table 12). This increase in payables can also be attributable to the ongoing liquidity challenges at the Authority, rendering it unable to fulfil its obligations to its suppliers and contractors in a timely fashion.

Table 12 Accounts Payable for Fiscal Years 2016 – 2020

FISCAL YEAR	ACCOUNTS PAYABLE (TT$)
2015/16	2,317,350,468
2016/17	3,050,110,079
2017/18	3,654,492,976
2018/19	4,188,427,870
2019/20	4,226,560,810

Source: Management Accounts FYs 2016-2020

In an attempt to alleviate this situation, the Authority has implemented the following:

i. <u>Prioritization of payments</u>

- Recurrent operating liabilities are categorized for payment based on the critical nature of the expenditure (e.g. payment for chemicals, materials and supplies, rental of heavy equipment, etc.) and assigned a priority for payment from available cash flows.
- A supplier recommendation listing is submitted for CEO review and approval.
- Where possible invoices are selected based on age and older invoices are paid first.

[47] Debt Recovery Action was put on hold from March – September 2020 on account of the COVID-19 Pandemic

- Payments to PSIP project contractors are facilitated when funds are released or approval received from the MPU for utilization of internal funds.

ii. Scheduled Payment Plans

- Payment plans are negotiated with contractors to settle outstanding invoice amounts over a stipulated period.

iii. Trade Financing

- The Authority explored trade financing arrangements with three (3) financial institutions which presented proposals for debt buy out arrangements for validated aged debt. These proposals were submitted to the MPU for its consideration and arrangements were in train for presentations to be made by the financiers to the Ministry and Authority. This activity was postponed to a later date due to the COVID-19 pandemic.

Unrecorded Liabilities

One of the major challenges facing the Authority in dealing with its payables is the issue of unrecorded liabilities. The Authority has determined that at the end of FY 2020, unrecorded liabilities were in the vicinity of **$**587.0Mn.

In order to tackle this challenge, the Authority initiated an Unrecorded Liabilities Project aimed at quantifying the total outstanding liabilities including any unrecorded liabilities for goods and services received as at December 2017 and continuing every month thereafter. The project included the framework for determination, recording and recognition of all creditor obligations by each Division.

The exercise quantifies “bona fide” liabilities, which are to be settled, inclusive of their age and whether the amount pertains to recurrent or capital expenditure. This data is then used to inform Executive Management, the Board and External Stakeholders of the budgetary allocations and cash requirement necessary to settle these liabilities. To facilitate this process, the Authority has developed an SOP, which provides guidelines for determining, verifying and recognizing unrecorded liabilities. This process has however been retarded due to delays by User Divisions

in submitting invoices and supporting documents for validation checks to be performed and the requisite approvals sought for recognition of the invoices. The projected completion date for this exercise is the end of FY 2021. To curb this occurrence, going forward, the Authority proposes to implement e-invoicing for the submission of invoices directly to the Oracle enterprise solution. Additionally, the inclusion of a performance measure on the performance appraisals of all Accountable Managers is to be implemented.

2.3.2 Debt Profile

As of October 31, 2020, the Authority's debt profile constituted the following:

Government Guaranteed Debt	-	TT$3,296,177,925
		US$100,000,000
Letters of Guarantee	-	US$60,000,000
	-	TT$12,599,503.21 (Overdraft Facility)

Government services all the Authority's debt by way of transfers.

In terms of the Authority's liability to the Trinidad and Tobago Electricity Corporation (T&TEC), the total amount outstanding as of October 31, 2020, is as follows:

Validated	-	$41,518,793.60
Unvalidated	-	$42,825,489.30
Total	-	$84,344,282.90

2.3.3 Audited Financial Statements

After missing several deadlines, WASA's 2016 Audited Financial Statements were submitted for review by the Ministry on October 30, 2020. The Authority has set a timeline of December 2021 for the completion of the audit of the 2017 to 2020 Financial Statements.

Since 2013, the auditors, Ernst & Young, have opined that the Financial Statements of the Authority have not met International Financial Reporting Standards. As such, for the years 2013-

2016, they issued “Disclaimers of Opinion” which is tantamount to a refusal to express an opinion on the financial statements. These Disclaimers have been issued on account of the lack of audit evidence in several areas, as follows:

- Property, Plant and Equipment;
- Accounts Payable;
- Revenue and Receivables;
- Personnel Expenses; and
- Opening Balances.

In all these areas, the documentary evidence was inadequate to support the data presented. In the area of *Property, Plant and Equipment*, in particular, the Authority was unable to provide an appropriate register to support the existence and completeness of assets recorded at the end of the year. The Auditors found that the Authority had not performed a physical verification and useful life exercise for several years. As such, the Authority was unable to appropriately derecognise assets, which were decommissioned and replaced during the financial year since the Authority did not perform a *Useful Life Assessment* of these assets in accordance with International Accounting Standards (IAS16 “Property, Plant and Equipment”).

In an effort to break this cycle of “Disclaimers of Opinion” WASA has initiated an Action Plan which it hopes will yield the desired results in the near future.

2.3.4 Results of Financial Modelling Exercise

At the request of the MPU, the IDB contracted K&M Advisors (K&M[48]) – an infrastructure, finance and engineering advisory firm, with wide expertise in the area of financial modelling – to develop a financial model for WASA with the assistance of key stakeholders (WASA, MPU and IDB). The objective was to better understand the current financial position of WASA as well as the impact of COVID-19 on WASA.

[48] K&M has worked extensively on water sector projects in the Caribbean

In the course of its analysis, K&M made the following observations:

- WASA's revenues, which decreased from TT$839Mn. in 2015 to TT$709Mn. in 2020, are a small component of its financials, due to the fact that tariffs, at US$0.56/cm**,** are well below the costs required to provide the service;

- The volume of NRW is unknown since WASA does not have accurate information regarding the components of its water balance. Due to the lack of information, the assumptions in the model are limited to the overall volume of NRW. While the model assumes an NRW figure of 50% (from 2017 to 2020), it is likely to be higher and could exceed 60%;

- This level of NRW reduces revenues and increases Operating Expenditure (OPEX). Reducing NRW and increasing staff productivity are essential for reducing OPEX;

- When compared with its peers, WASA's average OPEX is much higher and its average tariff much lower;

- In 2020, WASA had 12.7 staff per 1,000 connections. This is approximately twice that the average for its peers. According to the World Bank, the value for a "good" performance is 5.0 to 6.5;

- At over 50%, Staff Costs make up the majority of WASA's total operating expenses**.** On average, other water utilities see staff costs around 36% of operating expenses;

- The average annual staff compensation for WASA was US$28,000 in 2020 which is slightly below the US$33,000 average for its peers in the Caribbean;

- WASA's EBITDA (Earnings before Interest, Taxation, Depreciation and Amortization) margin has been highly negative since 2015 (-237% in 2020). Well-performing utilities have EBITDA margins above 15-20%; and

- WASA's Capital Expenditure (CAPEX) since 2015 has been insufficient to ensure an adequate level of operating efficiency, quality of service, and access. CAPEX averaged about TT$426 million from 2015 to 2020, with a decrease from TT$849 million in 2015 to TT$201 million in 2020.

General Assumptions Underlying the Model

Table 13 General Assumptions Underlying WASA's Financial Model

FINANCIAL ASSUMPTIONS	
Government Subvention	• TT$1.017Bn. in FY2021 as per approved budget • Reduction of 10% per year thereafter
Tariffs	• 0% increase in water and sewerage tariffs in FY2021 • 5% increase in water and sewerage tariffs in each year from FY2022 to FY2025, inclusive
Debt Refinancing	• WASA services existing debt on a timely basis • Annual cash deficit is financed with loans with 10-year repayment periods and an interest rate of 5%
CAPEX	• TT$2.06Bn. for FY2021 to FY2025 projected by WASA (includes TT$168.5Bn. approved in WASA's budget for FY2021)
OPERATIONAL ASSUMPTIONS	
Non-Revenue Water (NRW)	• NRW is 50% as of FY2017 • WASA puts in place a NRW reduction programme • NRW falls on a straight-line basis from 50% in FY2020 to 45% by end-FY2025
Staff Costs	• Number of staff per thousand water connections remains the same as at end-FY2019 (12.7) • Staff compensation does not increase on a real basis through end-FY2021
Collection Rate	• Collection rate increases on a straight-line basis from 85.0% at the beginning of FY2021 to 90.0% by the end of FY2025
Demand Forecast	• Growth of water clients increases at same annualized rate as registered from Jan 2020 to Sept. 2020 • No change in average consumption by water clients • Demand for sewerage services for projected years is same as for FY2020

Modelling Scenarios

Three (3) separate scenarios: Base Case, Optimistic Scenario, and Pessimistic Scenario were developed. The general assumptions for the three (3) scenarios are the same except for those indicated in Table 14 below.

Table 14 General Assumptions For The Three (3) Modelling Scenarios

Indicator	Base Case	Optimistic Scenario	Pessimistic Scenario
Tariffs	• No increase in FY2021 • 5% annual increase 2021-2025	• No increase in FY2021 • 10% annual increase 2021-2025	• No increase in tariffs
NRW	• NRW falls from 50% in 2020 to 45% by Sept. 2025	• NRW falls from 50% in 2020 to 40% by Sept. 2025	• NRW begins at 55% in Sept. 2020 and does not decrease
Number of staff	• Staff per 1000 water connections remains the same from 2020 to 2025	• Staff per 1000 connections falls on a straight-line basis to 11.82 by Sept. 2025	• Staff per 1000 water connections remains the same from 2020 to 2025

Table 15 Results of the Three (3) Modelling Scenarios

Indicator	Value in 2020	Base Case	Optimistic Scenario	Pessimistic Scenario
Revenues in TT$ million (2025)	709	858	1,161	795
Number of employees (end-2025)	4,828	4,976	4,727	5,181
Staff costs in TT$ million (2025)	1,254	1,276	1,212	1,329
Volume of water supplied (2025)	375.3	409.0	377.4	451.1
Average OPEX (TT$/m3 billed)	14.13	11.20	10.68	12.92
OPEX in TT$ million (2025)	2,387	2,500	2,383	2,622
EBITDA in TT$ million (2025)	-1,678	-1,535	-1,222	-1,827
EBITDA Margin % (2025)	-237%	-159%	-105%	-230%
Net income before GORTT subventions in TT$ million (2025)	-2,204	-2,561	-2,211	-2,887

Analysis of Projections (Table 15)

- Regardless of the scenario, WASA's net income before subventions will remain in the deficit above the level of $2.0Bn. With the projected decline in subventions over the period, huge operational deficits will persist.
- With increased borrowing, interest expenses will also increase over the period.
- Optimistically, with the assumed tariff increases, WASA's revenues are projected to reach $1.16Bn. by 2025. This increase will not be sufficient to improve operational efficiency despite the proposed reductions in operational expenses due to staff cuts, and a reduction in NRW.
- Even with a projected reduction of 10% in NRW from 2021 to 2025, WASA's OPEX will not achieve efficient levels.

Conclusions of K&M

1. Since WASA does not have the financial resources to turn itself around on its own, any plan to achieve a turn-around must involve a collaborative effort between the Government and the Authority. There are some actions, however, that the Authority can undertake on its own, utilizing its current resources as outlined in Table 16.

2. COVID-19 has not had a material impact on WASA's financial performance. This is largely due to the Authority's fixed operating costs and debt service requirements combined with its small revenue base. However, the impact of COVID-19 is likely to change if WASA's access to funding is reduced as a result of Government decreasing either the subventions it provides or the support required for WASA to obtain funding from commercial banks.

Table 16 Comparison of Actions which WASA Can Undertake Alone and Actions which Require Collaboration With The Government

Joint Actions Between WASA and GORTT	Actions to be led by WASA
▪ Set realistic objectives for WASA's performance, and identify resources required to meet those objectives. The objectives should include increased access, quality of service, operating efficiency, and financial performance. ▪ These objectives should be for a multi-year period (e.g. 5 years) and must include annual targets.	▪ Develop a time-bound plan to fill information gaps, including: - The water balance (for example, physical leaks, apparent losses, and volumes of water consumed by customers without meters) - The cadastre of its customers - Condition of its assets and investments required to rehabilitate them - The quality of service supplied (for example, continuity and pressure)
▪ Develop a sustainable funding plan for WASA that considers constraints regarding tariffs, government subventions, and access to financing.	▪ Develop a strategy for increasing staff productivity.
▪ Assess alternatives for reducing the cost of servicing existing debt.	▪ Implement a comprehensive programme for reducing NRW.
	▪ Prepare a strategy to increase revenues.
	▪ Develop a prioritized CAPEX plan based on objectives and funding plan agreed with Government

2.3.5 Conclusions

- By all international accounting standards, the Water and Sewerage Authority is **insolvent.** Unless financially supported by the Government, the Authority is unable to meet its basic monthly operating expenses as well as debt servicing obligations.

- There is an **underlying resistance** by the Authority to take decisive action to correct pervasive inefficiencies in its operations which can reduce cost, despite several entreaties by the Ministry in that regard. This "push back" is particularly strong in the area of emoluments.

- There is a severe **lack of efficiency in the billing and collection processes** and this is adversely affecting revenue collections. This could probably speak to the introduction of a private company to review and update the customer database and to deal with billings and collections.

- There is **too wide a disparity between operating revenue and expenditure**. While the Authority is not a profit-making entity, best practice would dictate that at least the revenue generated should cover recurrent expenditure, for the most part. A review of the business model is urgently needed at this time.

- **Wages and Salaries consistently represent over 45% of the expenditure** of the Authority when best practices indicate that a range of between 30-40% is reasonable and acceptable.

- The Authority needs to exert greater efforts in containing overtime costs by exploring the option of **compensatory time-off** in lieu of financial compensation, particularly for monthly paid staff, as recommended by the Overtime Committee.

- Ongoing steps should be taken to **control the costs for the leasing of vehicles** as this has been trending upwards over the last two (2) years. Further, the Authority should conduct a needs analysis of the current fleet of 301 vehicles.

- Further **reductions in subventions** are required during the next five (5) years so as to wean the Authority off the Government's coffers and make the organisation more self-sufficient.

- Provide a roadmap to remove the country's reliance on desalinated water, particularly in the area of potable water.

- The **audit of the Financial Statements for FY 2017-2020** must be completed as a matter of urgency given its implications for the financial viability of the Authority.

2.4 CUSTOMER SERVICE

WASA's Customer service has been the subject of widespread negative attention over the years. The customer service framework comprises twelve (12) business service centres, a Call Centre Hotline, online complaints and contact forms, a WhatsApp contact number and various other social media platforms (Facebook, Twitter, Instagram and YouTube). These customer service access points all fall under the purview of the Customer Care Department, which is headed by the Director, Customer Care.

WASA's customer service has been plagued with inefficiencies that are only rivalled by the poor water supply service to customers. The Authority has demonstrated little commitment to proactively addressing its poor service delivery challenges, placing scant emphasis on meeting customer needs, evidenced by a callous disregard for customer complaints and providing timely feedback. The records of the MPU indicate that for FY year 2020, WASA's average complaint resolution time was 112 days. Previous efforts and initiatives to improve WASA's customer service delivery have resulted in only slight improvement during and immediately after an intervention, but no sustained results.

2.4.1 Organisational Arrangement

In recent years, WASA decided to awkwardly attach its key customer service access points (Call Centre) to Corporate Communications and (Business Centres) to Business Services instead of having this area operate as a distinct section of the Customer Care Division. As such, the customer service function has neither been placed to complement nor augment the Authority's efforts to improve overall service delivery to the public. Instead, it has been treated within the organisational structure as a clumsy appendage.

2.4.2 Call Centre Operations

WASA's Call Centre is a critical interface between the Authority and its customers. The Call Centre receives calls that range from service information requests, billing inquiries, leaks reports, water supply distributions enquiries and any other water and wastewater related complaints.

The Call Centre agents handle all inbound calls received via the Authority's 800 toll-free services, 800-LEAK (5325) and 800-4h20(4420), utilizing forty-six (46) trunk lines which are shared between both islands operating seven (7) days a week, sixteen (16) hours per day, two (2) shifts per day. The first shift is from 6:00 a.m. to 2:00 p.m. and the second shift commences at 2:00 p.m. and ends at 10:00 p.m. The two (2) daily shifts are operated by two (2) teams. A third team is utilized to accommodate shift breaks/roster.

The Call Centre operates on CISCO's Unified Communications Manager (CUMN) System, which integrates communication between phones, computers, voice and internet. However, the system experiences an unacceptable percentage of dropped calls. The System does not allow automatic responses to be programmed to inform customers of disruptions in water supply and on-going repairs, as well as reduce the regular occurrence of dropped calls and facilitate a feedback mechanism.

The Call Centre has no Call Overflow System to handle call volumes in excess of its handling capacity. There is regularly a long queue and calls either are abandoned or go unanswered. The MPU worked with WASA to develop a proposal for the use of an outsourced call handler to pick up the excess calls, but like so many others, this initiative was stalled within WASA.

Further, WASA does not have an effective Customer Feedback System where customers are contacted periodically until their matter is resolved. Many WASA customers report that in addition to not receiving the service requested such as truck borne water or a leak fixed, there is no follow up to verify receipt of service.

Another area of concern to customers is the inadequate explanations often provided by WASA's Service Centres on customer account issues such as bill variations, as well as the process and the lengthy waiting period to receive rebates. There seems to be unclear information available to

frontline staff about policies and procedures that impact customer accounts and their relationship with the Authority.

A critical challenge, which undermines WASA's service delivery, is the lack of integration of its information and management systems. This lack of integration between the Call Centre operations and the other customer service access points results in repeated complaints of conflicting and missing information on reported customer complaints and queries. This fragmented approach to information management is further compounded by the obvious disconnect between the Customer Care Division and the Operations Division. Customer service agents have little to no access to timely and accurate information except that which is provided in published schedules or notices. Even more unacceptable is the fact that there have been instances when WASA has called the customer to inquire if the leak reported was fixed.

Call Centre Staffing

Over the period April 2019 to May 2020, WASA expanded its Call Centre capacity by approximately 53%, increasing the number of agents from 35 to 54. The number of agents available per shift now ranges between 15-17. Notwithstanding this increase, there is still a shortfall in the number of agents required per shift to handle call volumes. Using the Erlang C formula[49], the adequate staffing required is in the vicinity of 27 agents per shift.

Call Centre Performance

Over the 20 month period (Feb 2019 to Sept 2020), WASA received a total of 823,346 calls (average 41,167 calls per month). This can be disaggregated into:

- 433,551 for the period *February to December 2019, (*average 39,414 calls per month); and
- 389,795 calls for the period *January to September 2020* (average of 43,311 calls per month).

Of the 823,346 calls received, 60.1% (494,570) were answered, disaggregated as follows:

- 261,035 for the period *February to December 2019* (average 23,730 per month); and
- 233,535 calls for the period *January to September 2020* (average of 25,948 per month).

[49] An internationally accepted formula which is a mathematical equation for calculating the number of agents that needed in a call centre, given the number of calls and the targeted service level.

The number of calls abandoned was 294,567, disaggregated as follows:

- 151,327 for the period *February to December 2019* which represents an average of approximately 13,757 abandoned calls per month; and
- 143,240 calls in total for the period *January to September 2020* which represents an average of approximately 15,916 abandoned calls per month.

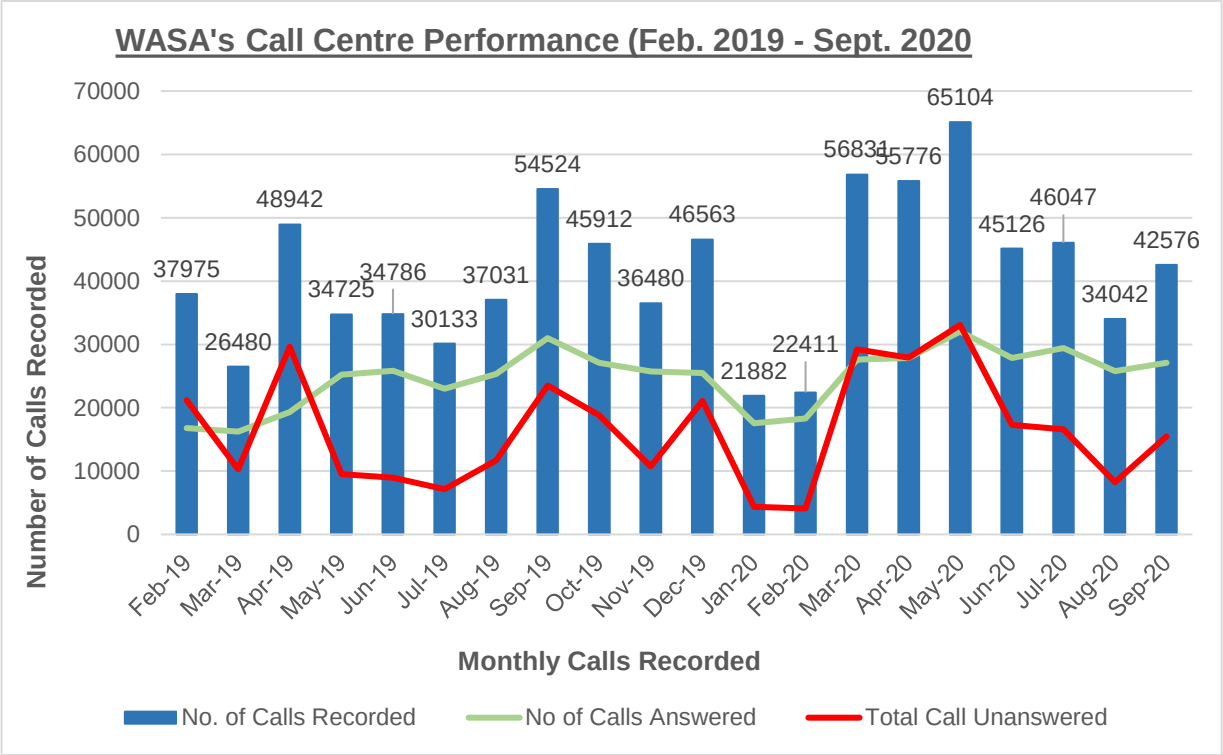


Figure 12 WASA's Call Centre Performance during the period of February 2019 to September 2020

Source: WASA

During this same period, the highest number of calls answered in any one month was 32,034 in May 2020. However, this only represented approximately 49% of the calls received. The highest percentage of calls answered by WASA's Call Centre agents was recorded in February 2020 at approximately 82%, but this was due to the fact that only 22,411 calls were received for that month.

International Benchmarks

According to the International Finance Corporation (World Bank Group) in its publication "*Measuring Call Centre Performance – Global Best Practices*,"[50] to maximize customer satisfaction and maintain an efficient, high-performance call centre, benchmarks in four (4) critical areas should be applied (Table 17).

[50] https://www.ifc.org/wps/wcm/connect

Table 17 Assessment of WASA's Call Centre Operations against Global Metrics Established by the World Bank – January 2019 - September 2020[43]

BENCHMARK	METRIC/ DEFINITION	GLOBAL METRIC	ACHIEVED	NOT ACHIEVED	WASA STATISTICS [51]	DATA NOT PRESENTED BY WASA
1. Telephone	**Service Level (Calls Answered)** % of calls received by the centre that are answered by a human agent within a certain time frame	80% of calls answered in 20 seconds		X	**28.5%**	
	Average Speed to Answer All calls that are not answered within 20 seconds. This results in an average overall.	28 seconds		X	**436.3 Sec**	
	Abandoned Rate The number of calls that are abandoned while the customer is waiting for a human agent. This value is expressed as a percentage of all calls received	5% to 8%		X	**32.9%**	
2. Efficiency	**Accuracy of Call Forecasting** If actual calls are higher than predicted, there will not be enough staff to respond which will put pressure on the entire team. This will impact the service level. If there are fewer calls than forecast, then agents will be under-utilized. Call forecasts need to be constantly reassessed and measured.	5% variance				X
	Adherence to Schedule Measures whether agents are on time for their shifts, whether they go to lunch and take breaks according to the schedule	95%				X

[51] Average over the period January 2019 – September 2020

BENCHMARK	METRIC/ DEFINITION	GLOBAL METRIC	ACHIEVED	NOT ACHIEVED	WASA STATISTICS [51]	DATA NOT PRESENTED BY WASA
	Occupancy Average % of the time an individual agent or all agents are actively occupied on a call. This includes talk time and wrap up time. Occupancy does not include ready time.	60-80%	X		75.2%	
	Call Duration Amount of time spent speaking to customers on the telephone.	4 minutes per call		X		
	Call Wrap-up Time Length of time an agent takes after the call has finished completing the case. This time may include updating the system, completing forms, and any other activities associated with the call.	6 minutes				X
3. Human Resource	**Absenteeism** Average number of agent days lost per year through illness and unauthorized absences as a % of contracted days. Includes all forms of unauthorized absence including long term illness. This is a key indicator of underlying motivation and stress issues, and affects productivity and potential revenue. It is important to measure agent absenteeism separately from that of the managers and team leaders as there is usually quite a difference.	5%				X
	Attrition % measure of staff turnover annually					X

BENCHMARK	METRIC/ DEFINITION	GLOBAL METRIC	ACHIEVED	NOT ACHIEVED	WASA STATISTICS [51]	DATA NOT PRESENTED BY WASA
4. Service	**Customer Satisfaction** A three pronged approach that combines quarterly customer surveys conducted by team leaders with independent third party analysis, and quality assurance measurements.	90%				X
	First Call Resolution Rate % of all calls resolved on the first attempt, without agent needing to refer the customer to a colleague, their manager, or calling the customer back.	70-75%				X
	Quality Assurance Measures the quality of calls, based on a set of criteria which the agent must cover during the call, including: how the agent answers the call; how the agent navigates the caller to a resolution; and how the agent ends the call					X

From the above table, it is evident that the performance metrics being captured by WASA are woefully limited in scope. This lack of data means that WASA is unable to give a comprehensive and accurate assessment of its Call Centre operations.

Comparison of Call Centre Operations of WASA, T& TEC and E99

The MPU undertook a comparative review of the Call Centre operations of WASA, T&TEC and the Emergency 999 Service in five (5) core areas: Management Structure; Staffing; Locations; Telephone System and the Call Overflow arrangement. The review revealed the following about WASA Call Centre:

- The management structure is top-heavy (5 levels of management);

- The telephone system is in dire need of an upgrade to introduce technology that allows for the integration of an Interactive Voice Management System (IVM) and Geographical Information Systems (GIS); and
- A call overflow arrangement is required to handle the large call volume.

The table below gives a synopsis of the five (5) core areas compared.

Table 18 Assessment of WASA's Call Centre Operations against T&TEC and E99

Area	WASA	T&TEC	E99
Management Structure	- Director, Customer Care - Senior Manager Corporate Communications, - Manager, Contact Centre - Coordinator, Customer Contact - 3 Supervisors/CSO II,	- Head of Department, Distribution, Planning and Support - Manager, Call Centre - 2 Engineers (rotated Day and Night; Direct Supervision)	- Director, ICT - Business Operations Coordinator (Administrator) - 5 Supervisors (1 per shift)
Call Centre Staffing	51 Call Centre Agents: 26 CSO I, 25 Customer Contact Reps. <u>In-house Call Centre only</u> 3 Shifts - only 2 on-duty per day: Shift 1 (6am – 2pm) – 18 Agents Shift 2 (2pm -10pm) – 18 Agents Shift 3 (off-duty) – 18 Agents* *Covers 16 hrs per day*	9 Call Centre Staff: - 7 Dispatchers - 2 Clerks *GIS Section also provides external support.* <u>In-house Call Centre</u> 3 shifts of eight hours per shift: Morning (7am-3pm) – 2 Dispatchers Afternoon (3pm -11pm)– 2 Dispatchers Night (11pm-7am) – 3 Dispatchers *Covers 24 hrs per day* <u>External- DirecOne</u> 2 shifts of 3 call operators each: Morning - 7am-3pm Evening - 3pm-11pm.	50 Call Centre Agents: - 5 groups of 10 agents (10 Agents per shift) *External support provided by Technicians who monitor radio communications and dispatch assistance, as required.* <u>In-house Call Centre</u> 3 shifts of eight hours per shift: Morning (7am-3pm) – 10 agents Afternoon (3pm -11pm)– 10 agents Night (11pm-7am) – 10 agents. *Covers 24 hrs per day* *5 shifts rotate continuously*

Area	WASA	T&TEC	E99
Call Centre Location(s)	Two Locations: - Head Office St. Joseph - Satellite office at San Fernando	One Location: - Mt. Hope Office	Two Locations: - St James (Police 999) - Chaguanas (990 Fire & Rescue)
Telephone System	CISCO's Unified Communications Manager (CUMN) System – integrates communication between phones, computers, voice and internet. No Interactive Voice Response (IVR) System.	T&TEC Outage Management System (OMS)– suite of applications which integrates an Interactive Voice Response (IVR) System, Geographical Information System (GIS), Commercial Database, Advanced Metering Infrastructure (AMI), and the Distribution SCADA. *T&TEC is also in the process of implementing a Mitel Contact Centre solution to manage all its calls.*	Zetron- Public safety system is an integrated and scalable communications solution. It provides: 1. Automatic Call Distribution (ACD); 2. Optimized call handling to receive, process, and complete emergency 9-1-1 calls and texts. 3. Advanced call handling features and mid-call recovery. Captures caller number and location. The E999 service has built in quality control and measurement. It registers performance during each 8-hr shift – eg. No. and length of calls. All audio is recorded for customer service and security reasons.
Call Overflow Arrangement	No Call Overflow System to handle call volumes in excess of WASA's handling capacity. Insufficient Call Centre Capacity- WASA is at least 25% less than its ability to meet its KPI's as at Aug 2019. With 6 less agents as at Oct 2019.	Hybrid approach - T&TEC uses both an in-house call centre(800-BULB) and DirecOne (800-TTEC) as the outsourced call handler. Overflow arrangement exists for both Call Centres – For in-house Call Centre, if customer calls are unanswered within 30 seconds, they are forwarded to relevant Distribution Area. For DirecOne, calls default to the relevant Distribution Area and if unanswered within 30 seconds, the call is forwarded to DirecOne.	The E999 Call Centre System utilizes an internal call overflow arrangement which manages all incoming calls. The System can accept and place up to 10 calls on hold at any one time.

2.4.3 Customer Satisfaction Surveys

WASA conducted domestic customers' satisfaction surveys in 2005, 2008 and 2013, all of which were intended to assist the Authority in understanding customers' perceptions about its products and services, brand and customer support.

Contrary to expectations, these surveys painted a positive picture of WASA, especially in the following areas:

- *Overall Quality of Service Rating for WASA*
  For customers that felt they received "good" or better benefits than expected from WASA, there was a 3% improvement from 2005 (18%) to 2008 (21%) and a 44% improvement from 2008 to 2013 (65%), as customers rated WASA's quality of service as being good, very good or excellent;

- *WASA's Overall Level of Satisfaction*
  Overall satisfaction increased from 55% in 2008 to 67% in 2013 with customers being "satisfied" and "extremely satisfied" with WASA as a provider of water and wastewater services; and

- *Customer Service Rating – Customer Call Centre Performance*
  Although perceptions in 2008 were that the service levels in WASA's Customer Call Centre fell from the 2005 levels, it showed constant improvement in the area "*Having courteous and pleasant CSRs*" scored the highest average rating when compared to 2005 and 2008.

The results of these Surveys[52] perhaps had the unintended effect of causing complacency on the WASA's part, because no follow-up Surveys have been undertaken in the last 7 years, even in the face of growing public disenchantment with the level and quality of service and a 12.6 % expansion of the domestic customer base.

2.4.4 Customer Complaints

In the past four (4) fiscal years, the majority of the complaints received by the MPU relate to WASA (Figure 13).

[52] Based on sample size of 1,300 persons

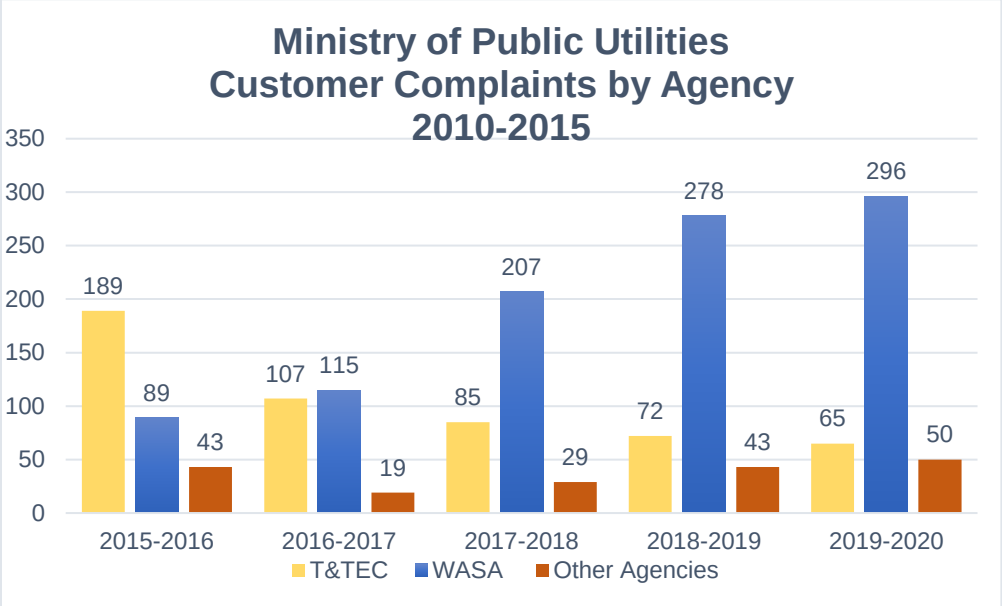


Figure 13 Record of Agency Customer Complaints Received during the Period 2010-2015

In FY 2020, a total of 411 issues were reported of which 296 (72%) were related to WASA. Within the FY, 193 (65%) were resolved and 103 remained outstanding, pending further investigation by WASA. The majority of issues pertained to the *lack of pipe-borne water* for extended periods (Figure 14). In relation to billing queries, WASA continues to give customers inadequate information in response to their queries and it takes on average 112 days to resolve complaints - a deterioration from the 27 days recorded in 2013.

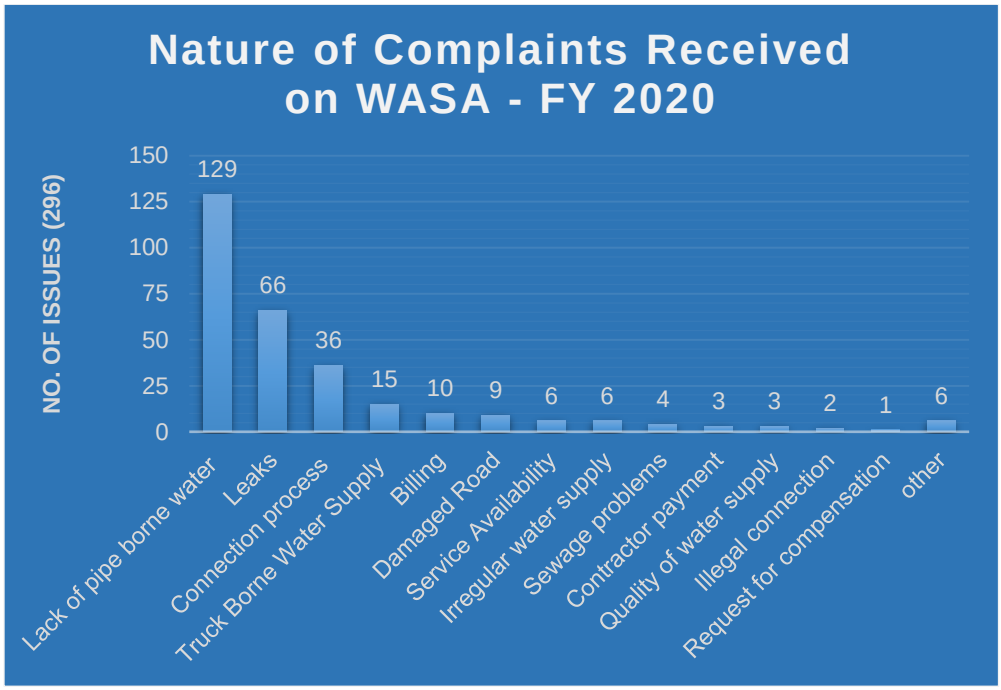


Figure 14 Nature of WASA's Complaints for the Fiscal Year 2020

Source: MPU Annual Complaints Report

The seemingly entrenched issues faced by the Authority continues to impact on the quality of service it delivers since the results of the surveys of 2005, 2008 and 2013 are consistent with the results highlighted in the MPUs Annual Complaints Report. These results are indicative of a continuation of the same issues and a deterioration of the services provided which diminishes customer confidence in the Authority.

2.4.5 Conclusions

- WASA's **customer service** is inconsistent with that of an efficiently functioning, modern utility that understands its role, relationship and the consequences of its actions/inactions relative to the population. Given WASA's ongoing challenges to effectively deliver an adequate water supply to the populace, there is an immediate need to address this shortcoming.

- WASA's **philosophy of customer service** delivery is flawed. Customer service enhancement should be strategically placed as a core component of the Authority's objectives and should be championed by WASA's management team instead of being seen as a "by-the-way" occurrence. Given the critical nature of water supply, there must be a

clearly demonstrated commitment to proactively identifying and addressing customer complaints. This approach will go a long way in not only improving service but also enhancing the Authority's public image.

- The data presented by WASA were inadequate to give a comprehensive assessment of the **Call Centre operations**. The metrics provided were limited and lacked integrity. Additionally, benchmarks were not aligned to a creditable internationally accepted entity.

- The use of **modern technology** to support customer interaction is critical. An Interactive Voice Response (IVR) system which automatically informs customers of disruptions in water supply and ongoing repairs, as well as address the regular occurrence of dropped calls and facilitates a feedback mechanism is an immediate priority.

- There is a need to undertake a detailed assessment of WASA's **customer service framework** to identify and ensure that the requisite skillsets, roles, functions, policies, procedures, performance standards and accountability mechanisms are in place at both the individual and collective level.

- WASA's **organisational structure** needs to be revamped to ensure that Customer Service is identified as a key functional area of the agency. This Customer Service Department should focused on improving interaction with customers and providing an avenue for enhanced service delivery.

- WASA's **Call Centre Operations** must have access to current GIS data, which provides the water supply to areas. This computerized graphic representation should be overlaid with revised water schedules, planned leak repair, truck borne water supply and other critical information to facilitate accurate and timely information sharing with customers. There also a need for improved and timely communication between the Operations Department and the Customer Service areas such as the Call Centre, so that accurate information can be disseminated to customers.

- **Policies and processes** must be standardized and shared with customer service personnel. Similarly, critical information on changes to customer accounts must be clearly

articulated in writing and supported by information published on WASA's Website and social media platforms.

- An up to date **Customer Cadastre** is essential. Currently, WASA does not have full and accurate data on its customer base.

2.5. TECHNOLOGY USE

WASA's adoption of modern information and operational technologies is low. Management and operational systems have not been modernised to incorporate and fully integrate new and cutting edge technologies which are being increasing used by utility companies globally to reduce cost, increase efficiency and enhance customer experience. Across the organisation, the Systems and Data architecture is poor and data analytics is not voluntarily embraced. This is especially evident in the Operations Division where much of the available knowledge is based on intuition rather than the use of technology to gather sound data and information as the basis for problem-solving and decision making.

Over the years, WASA has made sizeable investments to integrate its multiple data sources, by implementing various management software solutions to deal with its key corporate information systems, as well as, its technical operations. However, these systems, have not been fully and effectively deployed by all the major Divisions to enhance efficiency in terms of either the internal functioning of the Authority or the relationship between its customers, suppliers and contractors. The key management/operational systems introduced thus far are as follows:

Corporate Systems

- **Financial:** Oracle E-Business Suite, which deals with Procurement, Inventory Management and Financials.
- **Human Resource**: Oracle E-Business Suite with the activation of HR and Payroll modules.
- **Customer Care:** Oracle Based Customer Care and Billing System solution.
- **Integrating software:** Maximo 7.6 which facilitates data integration.

Technical

- **Operational Tools**
  - **SCADA –** Facilitates remote monitoring and control capabilities. From a total of 411 facilities (Wells, Booster Stations and Water Treatment Plants) only 18% is automated. Additionally, only 11% of these facilities utilise SCADA
  - **Meters-** Facilitates the electronic transfer of information from the source to the Authority. Currently, WASA utilises 28 bulk meters and 40 meters for industrial and residential customers, respectively. The Authority is currently sourcing 2,500 meters, which will employ a drive-by system for collecting data
  - **Data Loggers-** WASA currently has an estimated 500 data loggers to collect data for pressures and flows at key points in the network

2.5.1 Conclusions

- WASA has not effectively embraced holistic data management solutions to comprehensively connect all sources of data for efficient operations.

- The Authority has failed to successfully integrate modern software solutions into its operations to optimise network performance as evidenced by the lack of essential tools such as SCADA, meters and data loggers. In reality, this means that the Operations Division has been “operating in the dark” in its management of the water infrastructure network. There is no predictive analysis to facilitate pre-emptive action and the data is grossly lacking to make informed and optimised decisions. It is not surprising then that WASA is permanently caught in the mode of reactive crisis management.

2.6 INDUSTRIAL RELATIONS FRAMEWORK[53]

The Industrial Relations Framework includes:

- Wages;
- Working hours and conditions;
- Employee Benefits;
- Limitations on strikes;
- Union Rights and Responsibilities; and
- Management Rights and Responsibilities.

These elements have been examined within the context of the Collective Agreements which currently guide the relationship between the Authority and the three (3) Representing Majority Unions, namely the Public Services Association (PSA), the National Union of Government and Federated Workers (NUGFW), and the Estate Police Association (EPA). The findings are presented in Table 19.

All three (3) agreements include the standard items and, in some instances, exceed the provisions that would normally form the prerogative of management. Their entrenchment within legally binding collective agreements has severely curtailed management's ability to adjust or modify these items consistent with the financial and changing needs of the Authority.

Table 19 Collective Agreements between Recognized Majority Unions

BARGAINING ITEMS	PSA	NUGFW	E PA
Salaries/Wages	Salary is defined as the basic salary and includes: bonuses, benefits, commissions, royalties and special payments	Payment of wages is based on and includes allowances, emergency work, premiums, severance pay, miscellaneous provision, medical examination,	Salary is defined as the basic salary excluding allowances, bonuses, benefits, commissions, royalties and special payments and the like'

[53] In order to arrive at parameters for the study an Industrial Relations Framework, which includes the standard components of a collective agreements was used. It forms the context within which WASA collective agreements are assessed. It also provides a basis for identifying the extent to which the agreements have exceeded the norm and encroached on the responsibilities of the Authority's management.

BARGAINING ITEMS	PSA	NUGFW	E PA
Hours and Conditions of Work	Establishes hours of work, shift work, overtime, and work on public holidays. The workweek is established at forty (40) hours.	Normal workday is eight (8) hours from 7 am to 4 pm, excluding mealtime (1 hour) Monday to Friday. Work on Saturday and Sunday are treated separately. The normal workday, the lunch hour may be varied by mutual agreement between the union and the employer.	Basically, a shift in nature and orientation is based on a forty (40) hour week, the normal shift is 8 hours, the week is inclusive of Saturday and Sunday.
Employee Benefits	Undefined and rolled into conditions of work to include a range of benefits, some defined as allowances. Benefits include: Pension, Medical Plan, Leave - A range of leave entitlements. (vacation, sick, casual, maternity, leave for union duties)	Benefits include Pension, Medical Plan, Leave-A range of leave entitlement. (vacation, sick, casual, maternity, leave for union duties)	Undefined as benefits but rolled into the agreement under leave arrangements and allowances.
Limitations and Responsibilities of Union	Makes provision for mutual respect of each party's rights but does not define the limitations of the union. It provides definitions of terms used in the agreement.	Defined as a collective responsibility and job security relative to Parliamentary Annual Appropriations and the general financial state of the Authority to sustain the maximum feasible level of employment Provide security of employment for permanent workers Provide a year of work annually to employees three effective years of service prior to 2008.	Agreements applicable to Precept Officers in accordance with the Supplemental Police Act (SPA15.02) and the IRA (88.01). Recognition of the right of the Association to represent its members on terms and conditions of employment subject to the SPA

BARGAINING ITEMS	PSA	NUGFW	E PA
Management Rights and Responsibilities	The rights of the Authority are defined as 'the Association recognizing the right of the Authority to exercise the normal prerogative and to discharge the customary functions of the employer. Management is defined as personnel including the CEO as designated by the Board of Directors to carry out duties under Section 2 and 3 of the Industrial Relation Act.	These responsibilities are outlined within the Unions rights under the collective agreement.	The Association recognises the rights of the Authority to manage and control its business, operations and its employees. Management is defined as personnel including CEO as designated by the Board to carry out duties under Section 2 and 3 of the Industrial Relation Act.

2.6.1 Terms and Conditions

WASA maintains a full range of benefits for all its employees, in some cases above and beyond what exists in other entities. The cost of its collective agreements is $1Bn annually. The wage bill represents approximately 50% of the utilities operating cost, with overtime costs representing between 15-18% of the total annual wage bill.

In the case of daily paid employees, Saturdays and Sundays attract double and triple time payments respectively. The highest utilisation of daily paid workers is in the Operations Division which is at the heart of the Authority's operations. These terms, which confine the daily paid workers engagement to the hours of 7:00 am to 4:00 pm, significantly affect the Authority's ability to respond to customer and operational needs that arise on weekends and after 4:00 pm, and contribute immensely to the overtime bill.

Generally, the terms and conditions of employment for WASA's employees are above the norm for comparative positions. While salaries and wages have remained unchanged since 2013, the nature of the classifications being largely public service in orientation, do not lend themselves to work arrangements consistent with the nature and scope of the Authority's required scheduling of pipeline maintenance, road restoration, and leak repairs to name a few.

2.6.2 Collective Agreements

It is within this context that the Collective Agreements signed between the Authority and the PSA, the EPA, and the NUGFW were examined to determine their appropriateness to the future of the Authority.

All three (3) agreements expired in **2013**. However, they all make provision for the respective terms and conditions to continue to be enforced until a new agreement is established.

Allowances

The range of allowances within the Authority's current Industrial Relations Framework is in the main, unrelated to the operating aspects of the business of producing, storage, transmission and distribution of water. While this applies across the board, it is particularly relevant in the case of the Collective Agreement with the NUGFW on behalf of the daily paid employees where approximately twenty (20) allowances or premiums apply.

Further, WASA's management is significantly compromised since it is required to manage approximately 28 allowances for the entire employee population. Of these, ten (10) relate to monthly paid employees, (17) seventeen are related to hourly rated workers and seven (7) are premium related allowances. In the case of security staff, nine (9) allowances apply. The wide range of allowances include: high-cost items such as overtime, on-call and commuted overtime (Table 20). In an environment of limited financial resources, this is unsustainable.

Table 20 Range of Employee Allowances

ITEM/ARTICLES	PSA	NUGFW	EPA
Overtime	✓	✓	✓
Cost of Living	✓	✓	✓
Traveling & Related	✓	✓	✓
Separation	✓	See Severance Pay	✓
Special Travel	✓		
Meal	✓	✓	
On-call	✓		
Special Sewer Allowance	✓	✓	

ITEM/ARTICLES	PSA	NUGFW	EPA
Hazard Allowance	✓	✓	
Driving Allowance		✓	✓
Laundry Allowance		✓	✓
Shift		✓	✓
Separation	✓	✓	✓
Subsistence		✓	
Rural Workers (Company Transport)		✓	
Transfer Allowance		✓	
Vehicle responsibility over lunch, (overtime)		✓	
Standby Allowance		✓	
Sewer Maintenance Worker Allowance		✓	
Premiums			
Height		✓	
Shift		✓	
Uniform, Protective Clothing and/or gear		✓	
Chemical Handling		✓	
Depth Premiums		✓	
Others - Abnormal Hazards, Protective Gear		✓	

Leave and Employee Benefits

Leave Arrangements

Within the range of benefits embedded in WASA's collective agreements, authorised absences for Annual Vacation, Casual leave, Illness and Extended Illness, Maternity /Paternity and Bereavement, can be categorised as standard collective agreement items. There are at least five (5) other leave arrangements which have found their way into the Collective Agreements that are outside the legal responsibility of the Authority as an employer, and should therefore remain the prerogative of management. These include: leave for religious reasons, special leave, study leave, other than permanent workers, and leave for national and international duty.

Employee Benefits

Human Resource practice recognises the importance of employee benefit packages, these are items which, while not directly related to the operations and production aspects of the organisation's business, add value to the employee's well-being. Separate from allowances the employee benefit can serve a useful purpose of positively impacting the work environment.

The menu of benefits within the current collective agreements focuses mainly on [54]Hygiene Factors or elements. When these are present, they do not act as motivators but if absent can lead to declines in employee satisfaction. WASA maintains a wide range of benefits that fall within the Hygiene category. As such, theoretically, they add little economic value to the Authority, but serve to engender a dissatisfaction climate within the Authority if they are tampered with.

These include special leave arrangements, medical services, personal insurance, study leave, paternity leave and employee loans (Table 21). Authorised leave and benefits constitute a contingent liability upon the Authority and impact its financial position. Of major concern is the extensive range of benefits made available to daily paid employees, which have become entrenched in the respective collective agreement.

Table 21 Types of Administrative Leave

LEAVE ADMINISTRATION	PSA	NUGFW	ESTATE POLICE ASSOCIATION
Annual Vacation	✓	✓	✓
Casual	✓	✓	✓
Sick Leave	✓	✓	✓
Extended Sick Leave	✓		✓
Injury Leave	✓	✓	
Leave for Religious Reasons	✓	✓	✓
Leave for Trade Union Business	✓	✓	✓
Maternity Leave	✓	✓	✓
Paternity Leave	✓	✓	✓

[54] Hygiene factors are the characteristics associated with job dissatisfaction. When these are present and adequately addressed, people will not be dissatisfied nor will they be satisfied. Motivation or satisfaction factors focus on achievement, recognition and responsibility

LEAVE ADMINISTRATION	PSA	NUGFW	ESTATE POLICE ASSOCIATION
Special Leave	✓	✓	
Study Leave		✓	
Bereavement Leave		✓	✓
Other than permanent workers		✓	
Leave for National & International Duty			
Employee Benefits			
Pension		✓	
Home Ownership Plan		✓	
Group Life		✓	
		✓	
Chemical Handling			
Depth Premiums		✓	
Others • Abnormal Hazards • Protective Gear		✓	

Overtime

Monthly Paid

Three (3) of the main principles that are used in the review of overtime arrangements are:

- Overtime is payment for work conducted outside the normal workday/shift;
- Employees whose remuneration are based on a monthly salary cannot earn overtime; and
- Overtime is paid on base pay and does not include allowances and other emoluments.

In the case of WASA, all of these principles have been violated. This is particularly the case relative to monthly paid employees in the Monthly Paid Bargaining Unit. In its purest sense, the Authority is paying twice for the same one body of work. It has bought the employee's services on a monthly basis and is now paying again on an hourly basis.

Additionally, the agreement derives a formula for the calculation of overtime payments that incorporates allowances in determining the base pay upon which the overtime is being calculated. This is highly unusual particularly when on-call forms part of the emoluments for targeted monthly paid employees.

Security

From an overtime perspective, the Collective Agreement for Security personnel, who are all Shift workers, is cause for grave concern. On the one hand, it clearly indicates that overtime does not fall under the agreement but at the same time provides a formula for payment of overtime where an officer has to do a double shift, resulting in the overtime payroll for Security being the highest among all groupings.

Daily Paid

The pattern of rates and overtime payments is consistent with the rates as they apply in the industry norm. There can be no doubt, however, that given the nature of the Authority's operations, these workers should be shift workers. Under the Daily Paid Collective agreement, the normal workday is defined as consisting of eight (8) hours from 7.00 am to 4.00 pm. Provision is made for a lunch hour of 11.00 am to 12.00 noon. The agreement defines the normal workweek for hourly, daily and weekly paid to be 40 hours Monday to Friday. It excludes Saturday and Sunday but makes separate provisions for work on those days.

Work beyond the normal is paid at time and a half for the first four (4) hours, double for the second four hours and triple for work beyond that. Work on Saturday and Sunday is deemed to be overtime, eligible and paid a guaranteed eight hours at double time, the second eight (8) hours at a triple time and the next four (4) at four times.

The daily paid agreement makes provision for a category of workers titled 'Special Categories', whose normal day is deemed to be six (6) hours. Implicit is the payment of overtime for work in excess of the first six hours. This applies to shift workers inclusive of:

- River workers;
- Workers in Wastewater Maintenance;
- Workers engaged in Servicing of Vehicles; and
- Workers engaged in Topographical and other Surveys.

For ‘Watchmen’, Saturdays and Sundays are paid at straight time. However, they are entitled to two (2) Saturdays off per month. Under the daily paid agreement, work performed by workers in this category on Saturday and Sunday is guaranteed at a minimum of eight (8) hours at double time, triple time for the next four hours and four time for work beyond that.

WASA is a 24-hour operation. In the current environment, the public expectation is that work related to the Authority’s leak repair and emergency work programme would be conducted after the period defined in the agreement as the normal workday from 7.00 am to 4.00 pm. Further, the cost of work beyond 4.00 pm. and on Saturday and Sunday becomes prohibitive. In addition, daily paid staff are required to work in the other operation and production areas of the business that are twenty-four (24) hours in nature, giving rise to a situation that is entirely inconsistent with modern business practices.

2.6.3 Conclusions

License to Operate

An examination of the nature and scope of all three (3) collective agreements shows that the agreements are heavily weighted in the favour of the worker and the union. It shows a number of management responsibilities being subsumed in the agreements requiring the agreement of the Union/Association and in others, mandatory consultations. This is burdensome and although the management may choose to ignore the requirements, the Unions/Associations consider their agreements sacrosanct, and rightfully demand that they be respected.

Thirty-four (34) items that normally would be the purview of the management of WASA are treated in a manner that requires union intervention. Some of these bear little relevance to the work of the Authority itself. Of special and grave concern is the fact that WASA’s supervisory and senior technical staff are members of the monthly paid bargaining unit. While contemporary approaches to managing operations, emphasize partnership and collective/team management, this becomes difficult to achieve within self-serving environments such as that which the current arrangement allows.

Workforce Alignment

To review the inter-relation among the three (3) collective bargaining units and the alignment of the Authority's workforce and operations/workflow the Committee examined the integrated nature of the Unions' collective bargaining strategy.

Within that context, the approach is that the monthly paid agreement is negotiated first, and used as the basis for negotiation by the daily paid, and then the Security. In essence, the Industrial Relations structure reflects a primary or premium level of emoluments throughout the workforce.

While the quantum is different, little distinction is made between levels of staff and their range of emoluments. It is evident that over time, the salary ranges and wages have experienced compression. Collectively, the agreements make provision for loans, health benefits, allowances and similar terms and conditions. The phenomenon of the *'compression of scales'* is evident in all arrears of the compensation and benefits package. In WASA's current circumstances, the allowance portfolio is extensive as it is expensive. It is also limited in its ability to engender greater productivity in the Authority.

Allowances

The pattern noted in case of the benefit administration area, is also observed in the area of Allowances. Only a limited number of the allowances are directly work-related with the larger portion being easily construed as social in nature. From an operation or workforce alignment viewpoint, the components of the bargaining units do not adequately engender an integrated workflow between the sections of the workforce (monthly paid, technical supervisory personnel and the daily paid) groupings. A more detailed analysis is necessary to determine the extent to which these groupings overlap in the field and, as a consequence, negatively impact output and cost.

Transition/Transformation and Change

This section focuses on the nature and scope of the collective agreements and the degree or the extent to which the current arrangements support or hinder future transformation and organizational change.

It is to be noted that in addition to the general comments presented earlier, the Collective Agreements make provision or requires the management to gain the agreement of the Unions/Association in the design of the new organizational structures or transformation plans.

The monthly paid agreement, e.g. specifies that the Union's or Association's concurrence is necessary in order to **create a job** or to redesign of units of production. **In others, it is specifically stated that transformation efforts by the Authority's management must be agreed upon prior to the introduction of any organisational changes that would impact members of respective bargaining units.**

These provisions would, of necessity, require the Authority to enter into Concessionary Bargaining, which would be based on the Unions giving back "hard won concessions" to the management, should WASA embark on any attempts at transformation or the introduction of a change programme or alternative business model. Concessionary items would have to include, *inter alia,* wages, vacation and leave entitlements, re-classification of daily paid employees, changes in working hours, pensions, insurance benefits and health care. The gravity of this situation and its obvious implications for the security of WASA's continued operations cannot be underestimated.

Currently, WASA may be engaged in such transformation discussions, and in negotiations relating to the restructuring and transformation of the Authority since the relevant agreement makes provision for such. It is highly unlikely though that such discussions are with a view to arriving at the strategic intention of the authority. It is also unlikely that the current negotiations are focusing on alternative methods of work and technology.


PRESSING THE RESET

3. Pressing the Reset

The crisis in which WASA now finds itself is the natural outcome of decades of poor governance and inept management. In fixing the problem, there is no silver bullet solution, that is, easy, quick, inexpensive and risk-free. The Committee has concluded that it would be near impossible for WASA, in its current configuration and with its current leadership, management capability, systems and culture, to be able to transform itself into a high performing public utility.

The case for a new model for the management of water and wastewater resources in T&T resides in the fact that the Authority has deeply entrenched deficiencies in all the core aspects of its business. Some of these deficiencies are rooted in WASA's current business model, which has sustained a vicious spiral of decline, whilst others stem from a deeply entrenched non-progressive culture that largely ignores customers' needs.

IN SUMMARY:

- WASA is over staffed by approximately 2500 employees
- WASA's productivity is way out of line with international and regional utilities of comparable customer base (Jamaica similar customer base 4 employees per 1000 connections; WASA 13 employees per 1000)
- WASA is a top heavy organisation, maintaining 246 management personnel for a staff of 4,828
- Cost per employee is exorbitant $16,000
- The Authority's Board and management have been unable and/or powerless in implementing the necessary changes to improve performance
- Attempts at right-sizing have been unsuccessful (failed VESP)
- The closed culture of the organisation does not auger well for re-engineering, re-structuring and organisation change
- The workforce structure is out of step with contemporary job structures wherein shift, part-time work arrangements are targeted to meet the 24/7 nature of the business
- Government has been expending approximately $2B.n annually to keep WASA afloat. Approximately 50% of this sum is extended on wages and salaries.
- Overtime is a serious problem and is equivalent to approximately 16% of the wage bill.

The Sub-Committee has concluded that the Authority would be unable to transform itself into a high performance utility given in its current configuration and with its current leadership, management capability, systems and culture, to transform itself into a high performing public utility.

3.1 STRATEGIC INTENT – STRENGTHEN OUR WATER SECTOR AND ENSURE THE SUSTAINABILITY OF OUR WATER RESOURCES

On the heels of climate change and increasing climate variability, the COVID-19 pandemic has underscored the criticality of water to life. The Sub-Committee is of the view that the sustainability of our water resources is paramount and now is the time to "**Press the Reset"** to strengthen our water sector and move towards a high-quality performance water utility, with a governance framework that is designed for performance and accountability and with the concomitant legal and institutional capacity.

In designing the institutional architecture, the Committee has been guided by the following:

- Water is increasingly becoming a critical resource for countries, regionally and internationally, and is likely to continue in that trajectory given the worsening impacts of climate change and climate variability;
- International best practice has demonstrated the criticality of separating the water resources regulator from the water utility, to ensure sustainability and equity in the utilisation of water;
- Wastewater management has emerged as a specialist field;
- Management of the water sector has shown tremendous improvement with the adoption of new management approaches and the use of technology;
- Contemporary business water management models have shifted to demand management rather than production and engineering as its base as is the case of the current WASA model; and
- Aligning the water utility with the value chain inherent in water management provides the opportunity to increase operational efficiency and achieve sustainability in water resource management.

3.1.1 Alternate Options for the Water Sector

The Committee considered three (3) options for the Water Sector, as follows:

Option A: Create Private Sector Partnerships;
Option B: Restructure the current WASA organization; and
Option C: Adopt a Water Management Corporatised Model.

Option A: Create Private Sector Partnerships

Some Governments in developing countries have been reluctant to divest the production and distribution of water to private interests. The evidence shows that Governments have been overly optimistic about the benefits of selling up. For example, in 'England, the average household water bill has risen by 40% above inflation, since privatisation in 1989.' In a majority of privatisation cases, companies still rely on public funds. A study by the Public Services International Research Unit found companies received nearly 500Mn. Euros from the European Bank for Reconstruction and Development from 1991-2012. There is a tendency for consumers to pay for the new water and sewer through higher water billing, with the State acting as guarantor in case the project has financial difficulties. Academically, this has been described as 'socialisation of risk and privatisation of profit'

There is a perception that developing countries cannot finance projects without private sector involvement. However, private companies rely on the same sources of investment that are available to governments—including IDB, World Bank, Donors, Commercial and Development banks—suggesting that privatisation is as much about political will as it is an economic necessity.

Given the state of WASA's infrastructure and the lack of detailed information on several aspects of its operations, this option is likely to be very expensive.

Option B: Restructure the current WASA organisation

Fundamental to any change effort is a mental shift in the designers, operators, and other stakeholders in the sector. The fundamental principles in successful transformation and change efforts are the recognition of the need for change, a willingness by all stakeholders to participate

in the change experience, and equitable participation in the internally driven change process. Change, unilaterally imposed from outside, does not produce the desired results.

Engendering a reformed WASA will require Concession Bargaining by the PSA, NUGFW and EPA. It is highly unlikely that given the degree to which collective agreements have encroached on management's ability to direct the nature and scope of the work of the Authority's operations that the representative bodies would want to negotiate this in good faith.

The heavy investment requirements coupled with the current state of the industrial relations arrangements would make this challenging, as transformation requirements would, of necessity, require downsizing, the design and creation of new work structures and workforce management practices.

The overriding assumption is that functionally the operating entity should be aligned to the value chain inherent in the water management scenario inclusive of new water management approaches. It is highly unlikely that this can be achieved given the existing organisational culture.

Further, there will be the requirement for:

- extensive corporate and business planning;
- rigorous market segmentation analysis;
- digitalisation of billing and payment systems;
- increased revenue collection;
- dynamic research and development capabilities driven by innovative cutting edge technologies and propelled by high performing teams;
- a human resource audit that identifies the jobs that are required to achieve the goals of the corporate/business plans developed;
- a modernised financial management system and an effective Internal Audit capability;
- changes to operating and decision making structures and rebranding of WASA's operations; and
- robust monitoring and evaluation.

Over the years, WASA has fallen short in all of these areas, which makes the transformation of the current WASA highly susceptible to failure.

Option C: Adopt a Water Management Corporatised Model

This option calls for the creation of a water management company registered under the Companies Act. The company will be vested with the operating assets of WASA that are free from encumbrance. It will manage the State's interest in the water sector.

The current model enacted in 1965 has served its purpose. It has inherited the cultures and approaches of its predecessor organisations inclusive of government centralised bureaucratic structures both in terms of the management and labour representations. Its operating structures and job classifications have been inherited from its predecessors and are now deeply embedded in the organisation.

From a transformation and change perspective, WASA's 'organisation ID' has remained unchanged over the decades of its existence. Transformation of the management of the water sector must take into account the fact that both internationally and regionally, water has become a critical resource and those entrusted with its provision must treat it as such.

3.1.2 Recommended Option: A Water Management Corporatised Model

The Sub-Committee recommends the adoption of a Water Management Corporatised Model that is consistent with the water value chain and structured as follows:

- A Water Resources Agency that is independent of the water and wastewater utility. A Note is before the Cabinet on an Integrated Water Resources Management Policy, which, *inter alia*, recommends the establishment of an independent Water Resources Agency. Towards this end, the Sub-Committee recommends that the WRA be established as a department under the Ministry of Public Utilities;
- A Water Management (Operating) Company: Publically owned water company that maintains all the State's Interests (Above & Below Ground Assets) with operations aligned to the water value chain as follows:
    - An Exploration and Production Division (Wells Drilling, Water Treatment, Reservoir Storage & Maintenance);

- A Transmission Division (Pipeline Maintenance, Optimization, Asset Integrity & Flow Management);
- Commercial and Distribution Division (Pipeline Network and Configuration, Revenue, Customer Service etc.);

- A Water and Sewerage Authority (WASA) that holds and manages the non-operating assets of the State that are currently vested in the Authority; and
- A wastewater entity managed by the new Water Management Company with Private Sector participation.

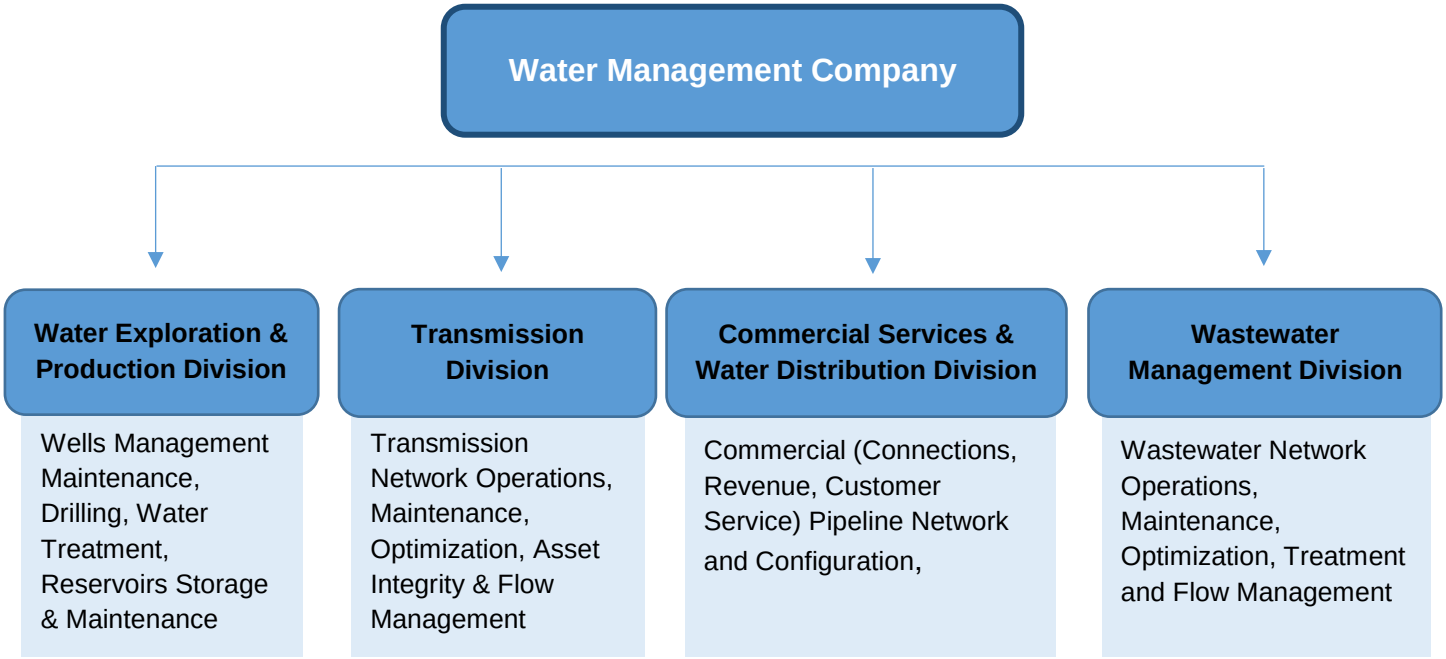


Figure 15 Water Management Company

3.1.3 Transitioning - QUO VADIS

The Sub-Committee acknowledges that the inherent challenge is to transit to the new model while maintaining the old model with some significant modifications. The Sub-Committee recommends that an Agile Change Approach be adopted to defining and designing the new water management model while navigating the rationalisation and resizing of the old model. As such, WASA will likely continue for a while yet, transferring full operations to a Water Management Company by September, 2023.

Strategically then, it is recommended that transitioning to the model above be accompanied by the acquisition of water management expertise for a period of three (3) years.

Given the nature and sensitivities around water and its supply, the Government and the population's shift to the recommended model will require a Transitionary Framework and Strategy (Interim Management Team/International Water Management Operator) to be implemented over a three (3) year period.

The risks associated with the transitioning must be closely and continuously assessed and managed. The major risks identified by the Sub-Committee are as follows:

- The need to maintain and stabilize the supply of water during the transition;
- The transition cost and funding required for moving from the existing model to the new model will be a risk and must be assessed early;
- The cost of maintaining two water entities is prohibitive and may have to be addressed in phases;
- Trade Unions will be reluctant to support the transition and will encourage employee discontent by withholding of labour and sabotage;
- The operations knowledge of WASA is highly intuitional, largely undocumented and reposed in individuals who might not be minded to share such knowledge with those outside of their circle; and
- The mistakes of previous attempts at reform and right-sizing are repeated. The VSEP exercise of 2012-2015 e.g. cost the Authority $396,579,367 for 2352 employees but the employee population remained at a consistent level of 4844, 5350, 4910, 4833, and 5285 in the years 2011-2015.

3.1.4 The Enablers of Transition

In order to mitigate against these risks, the Sub-Committee recommends that a number of enabling strategies must be executed, including:

- **Establishment of the recommended Water Management Structure with Operations comprising four (4) Divisions:**
  - ❖ Exploration and Production Division;
  - ❖ Transmission Division;
  - ❖ Commercial & Distribution Division; and
  - ❖ Wastewater Division.

- **Manpower Requirements:** Develop organisation Structures and Requirements consistent with the technical and operating parameters of each of the four (4) entities.

- **Capability Contracts:** Procure Water Management Capabilities to support the transition to the Water Management Company, the optimisation of network performance and transformation of key elements of operations such as leak management, water storage facilities, billings and collections through the use of modern technologies (SCADA, electronic network management, remote sensing, district metering) within a period of three (3) years.

- **Resource Ownership Transition Vesting:** Rationalise and (phased) transfer the operating assets of WASA to the new Water Management Company:

  <u>Above Ground</u>

  Assets outside the operating parameters and can be deemed non-operating assets that are above ground. For example, all infrastructure such as private access roads, buildings, grounds and other facilities; and

  <u>Below Ground</u>

  Operating assets re: all pipelines (transmission and distribution) and appurtenances above and below the surface.

- **Industrial Relations Concessionary Bargaining:** Manage negotiations with the respective representative bodies or bargaining agents (PSA Union, NUGFW, EPA). Engage them on the wind-up of WASA re: Pension Benefits, Separation Packages,

Retention and Conditions of Reemployment (if so desired) and Collective Bargaining Buy-outs.

- **Business Continuity (Risk Management Map):** Conduct a risk management exercise that addresses the inherent risks in all aspects of the transitioning process.

- **Communication Strategy:** Design and action a broad-based Transition Communications Strategy that informs, educates and influences all stakeholders in a manner that views them as significant partners in the country's transition to a new and productive water sector.

3.2 INTERIM MANAGEMENT AND TRANSITION TO THE NEW MODEL

The Sub-Committee is cognisant of the fact that rationalising the existing WASA will entail time and political will and, therefore, recommends the creation of an Interlocking Board and possibly a Committee designated to oversee and implement the process with both reporting to a Cabinet Sub-Committee which includes the Minister of Public Utilities, in order to facilitate an efficient transition to the new Water Sector. In addition, the Sub-Committee recommends the following Interim Management and Transitionary arrangements/actions:

- Separate the Water Resources Agency from WASA;
- Establish a performance agreement and timelines for the Board to achieve the Government's policy intent;
- Appoint an Interim Management Team, headed by an individual with extensive knowledge of, and experience in leading transformation in, the water sector and comprising a core group, in accordance with a rationalised structure, with skills and competencies in water management. The Interim Management Team will have responsibility for:
    - working with the Board of Commissioners in the transitioning process.
    - stabilising the operations of WASA to prevent further declines in the level of service to the population and financial haemorrhaging. The Team will be required to:
        - ✓ undertake an analysis of the current water supply situation in the different operating zones of both islands, identify crisis areas and solutions to ensure that all communities across the country receive a minimum of 24/2 water supply;

- ✓ rationalise expenditures in key areas;
- ✓ introduce measures to immediately enhance customer service;
- ✓ develop required policies and procedures and implement necessary system changes to enable WASA to function more efficiently in the interim period before operations are transferred to the new Water Management Company by the year 2023;

  - implementing a new project management system for the implementation of the PSIP to stabilise the water supply environment in the short term. The track record of the current PCM Division, especially as it pertains to its role in the management of key infrastructure projects of the Authority, demonstrates that this Government will be making a grave error to allow the current Unit to manage a programme of works geared towards bringing short, medium and long term solutions to the state of the water sector in the country. The Committee recommends an immediate restructure of the Unit;
  - developing a roadmap to remove the country's reliance on desalinated water, particularly in the area of potable water;
  - removing road restoration, following civil works by WASA, from under the purview of WASA to the Ministry of Works and Transport;
  - defining a strategy and action plan for private sector participation in key elements of the water value chain and in wastewater;
  - setting the foundation for transformation to the new Water Management Company;

- Establish performance metrics for the Interim Management Team and formalised reporting requirements;
- Procure the services of an international Water Management Operator to support the transition to the Water Management Company;
- Procure the services of international expertise to optimise network performance and transform key elements of operations such as leak management, water storage facilities, billings and collections;
- Facilitate the requirements of the RIC for a Tariff review;
- Appoint technical teams to:
  - implement new institutional arrangements, conduct an HR audit, identify transitional and permanent staff, create the organisational structures with role definition and process maps for the new water and wastewater utility;

    - undertake a full assessment/audit of WASA's water supply and wastewater assets. The team should locate, assess and verify the usefulness and ownership of the asset;
    - conduct an assessment of WASA's technological capability;
    - gather data and develop the scope and targets for a performance-based contract for an international Water Management Operator;
- Adopt an Agile Change Approach in defining and designing the water management corporatised model while navigating the rationalisation resizing and exiting of the old model;
- Develop a detailed risk assessment and mitigation strategy;
- Develop and implement a Transition Framework and Strategy over a period of approximately three (3) years that addresses the key enablers for the transition to the new water sector management model;
- Undertake a detailed validation exercise of WASA's liabilities (recorded, unrecorded and on Government books);
- Rationalise WASA's expenditure to separate core services from non-core services, and assess the cost-effectiveness of subcontracting certain functions;
- Acquire water management expertise (International Water Management Operator) for a period of three (3) years that will support the Interim Management Team and the CEO of the Water Management Company to establish the Company and transition to full operations. The current deeply rooted institutional arrangements and the exposures faced by the WASA will militate against Government's thrust for urgent organizational restructuring. Pressing the reset may be the perfect opportunity for a new organization to be established under the Companies Act, with the assistance of an International Water Management Company. This can be done using a Performance Based Contract that holds the company strictly to timelines and clear deliverables;
- Develop and execute a work plan for the transfer of assets and wind-up of WASA;
- Design and action a broad-based Transition Communications Strategy that informs, educates and influences all stakeholders in a manner that views them as significant partners in the country's transition to a new and productive water management sector; and
- Source an appropriate mix of multilateral funding (grant and loan resources) and Government to Government agreements to finance improvements in water supply to the

population, the establishment and operationalising of the new institutional arrangements for the water sector, and the transition arrangements.

3.3 STRATREGIC PILLARS TO GUIDE THE TRANSITION PROCESS

The Sub-Committee recommends that the following four (4) strategic pillars imperatives guide the work of the Board and Management of WASA over the next three (3) years:

1: Stabilise the operations of WASA and build public confidence in the Operations of the Water Sector and Government's Strategic Intent;
2: Improve Operational Efficiency and Customer Service;
3: Strengthen Financial Management; and
4: Restructure the Water Sector.

The timeline envisaged for the transitioning to the new water management model and the schedule for the implementation of critical actions under these four (4) pillars are provided at Appendix I and Appendix II, respectively.

Priority Infrastructure Investments

4. Priority Infrastructure Investments over the next 24 Months

Appendix III provides an indicative programme of infrastructure related investments for implementation over the next 24 months in order to increase water supply, improve network efficiency and capture essential data to manage distribution more effectively.

Financing

5. Financing

The transitioning to the new model comes with new and significant financing needs as the operations of WASA are stabilised and the new water company is formed and operationalised. During the transition, there will be a need for appropriate investment in key areas so as to allow the Authority to continue to meet its obligation to the population for the provision of an adequate, safe and reliable supply of water. Investments would be needed not only in new infrastructure and new technologies, but also in the maintenance and operations of the existing stock in order to improve their efficiency and reduce water losses. The “plane would need to be fixed while flying”.

Although, the specific financing requirements for funding the transition has not been estimated, given the under investment in asset maintenance and renewal, and the requirements for funding the proposed new institutional arrangements, it is reasonable to conclude that there is a huge financing gap that exists between investments required and current investments flows in the sector.

Hitherto, capital investment in the water sector was largely funded by Government under the Public Sector Investment Programme of the Ministry of Public Utilities. The projects were not properly prioritized, coordinated and aligned into a comprehensive strategy for increasing 24/7 water supply across the country. Going forward, much greater emphasis would have to be placed on strategic financial planning to ensure that the financial resources available are commensurate with the investment need to support the transition to the new water company.

In terms of specific financing options, one of the clearest opportunities lies with the multilateral financial institutions. Another financing option is a Government to Government Agreement.

The Sub-Committee had valuable engagements with senior officials of the Inter-American Development Bank (IDB); the Corporación Andina de Formento (CAF); and a consortium comprising Water Works Caribbean Inc. (WWC), a Barbados based water delivery and management company, Seureca - the engineering consulting group for Veolia of France, one of the largest water infrastructure and management companies in the world, and Remicatyn Ltd, a supply chain consultancy company registered in Trinidad & Tobago.

Both the IDB and CAF proposed interventions involved a mix of grant and loan financing with the quantum and terms and conditions to be determined, based on negotiations. The need for credible baseline information was underscored by all three (3) potential investors The IDB and WSS have undertaken studies on the local water sector and have worked closely with utilities in the Caribbean. The IDB has also worked with water companies in Latin America. Summarised below are the proposed interventions.

CAF

- Non-reimbursable Technical Assistance: Twinning in Corporate Governance:
    - A “twinning” can be explored with a top-tier service provider company, preferably English-speaking, to improve corporate governance management of WASA

- Non-reimbursable Pre-Investment Facility 2021-2022 to finance the following:

1. **Preliminary Diagnosis of NRW Components:**
    - Global Measurements of Water Produced and Transferred
    - Global Measurements of Water Sales, including Metering and Billing
    - Billing of Authorised Unmetered Consumption
    - Periodicity and Consistency of Measurements over time
    - Assessment of Global Losses over Last 5 Years
    - Assessment of Feasibility of Detailed Diagnosis via Pilot Area Survey

2. **Detailed Diagnosis of NRW Components:**
    - Identification of Representative Pilot Area;
    - Setting-Up of Representative Pilot Areas
    - Customer and Meter Survey in Pilot Areas
    - Assessment of Customer and Meter Data Base Reliability in Pilot Areas
    - Assessment of Leakage in Pilot Areas
    - Assessment of Meter Under-Registration in Pilot Areas
    - Assessment of Illegal and Unregistered Consumption in Pilot Areas
    - Assessment of Authorized Unbilled Volumes in Pilot Areas
    - Extrapolation of NRW Components to Entire Study Area

3. **Development of an Action Plan for NRW Reduction**
    - Optimization of Bulk Metering
    - Optimization of Meter Reading & Billing
    - Monitoring and Reduction of Authorized Unbilled Volumes
    - Programme for Leakage Detection, Location & Repair
    - Programme for the Reduction of Meter Under-Registration
    - Programme for the Reduction and Monitoring of Illegal and Unregistered Consumption
    - Institutional & Organizational Aspects – Change Management

IDB

- Technical Assistance which can provide access to the Water Operators Partnership that involves the exchange of best practices and lessons learned between water and sanitation utilities in LAC; access to Aqua Rating which is a tool to transform utilities by focusing on: quality of service, investment planning and implementation efficiency, operations efficiency, business management efficiency, access to service, corporate governance, financial sustainability and environmental management
- Conditional Credit Line for Investment Projects (CCLIP)[55] US$315 million comprising separate loan operations. The first loan operation can be available in 2021 and can finance: water infrastructure rehabilitation and optimization; institutional strengthening of WASA, WRA and MPU
- Supporting Non-reimbursable technical cooperation (US$800,000)
- Co-financing
- Non Reimbursable Technical Assistance to support the preparation of the project

The Consortium (WWS, Seureca and Remicatyn Ltd)

- A NRW reduction programme using the financing modality of a Government to Government arrangement with the Government of Germany
- The preferred financing option - buyers export credit with two (2) years moratorium on repayment supported by a Letter of Comfort

[55] The CCLIP is a flexible lending instrument that allows for long term planning of a series of inter-related projects over a period of time. No fees are charged on the outstanding balance of the CCLIP. Fees are only charged on the balances of any loan operation taken under the CCLIP

- Components
    - Preliminary Diagnosis of NRW Components
    - Detailed Diagnosis of NRW Components

IFC

The Sub-Committee is of the view that there exists considerable opportunities for private sector involvement in the water sector. In this regard, in 2018, the MPU initiated discussions with the International Finance Corporation (IFC) of the World Bank Group to explore the option of implementing PPPs. On the basis of these discussions, the following five (5) water supply projects were identified for possible PPPs:

- Beetham Reuse – Production of 45MLD
- San Fernando Reuse – Production of 6.9MLD
- Ravine Sable Storage – Production of 9.1MLD
- Tobago Groundwater – Production of 13.7MLD
- Test Well & Field Investigation of Aripo Mega Watershed – Potential Yield of 45MLD

The next stage of the collaboration with the IFC would involve the conduct of a Preliminary Due Diligence exercise to assess in greater detail the feasibility of each of these water supply projects, including the viability of implementation under a PPP scheme. The IFC had indicated its intent to access donor funds under its administration to undertake this exercise. The Sub-Committee recommends that the MPU submit a Note to the Cabinet providing a status of the work undertaken with the IFC with recommendations on the way forward.

Conclusion

6. Conclusion

Trinidad and Tobago needs to adopt a new water management approach in the water and wastewater sector. Restructuring the way that water is delivered to the national community will lay the platform for the change the country desperately requires. The economic challenges faced currently and public expectations, in terms of customer service, do not allow the state the luxury of maintaining the status quo. The organisation's culture, which is bureaucratic in nature and public service in orientation, does not lend itself to a contemporary approach to the management of the water and wastewater sectors. Similarly, the organization's current structure, with seven (7) divisions and an exceedingly top-heavy management, does not facilitate the organisational change that is now required, and more appropriately should be designed along a business value chain.

It is evident that the Collective Agreement Framework utilised by the Authority to manage its Industrial Relations and the practices that have derived from it, has long outlived their usefulness. This framework which is expensive, difficult to manage and heavily weighted in favour of the Representing Majority Unions emerged from a period in which Authorities like WASA, maintained a social responsibility mind-set in stark contrast to its core business of producing and distributing water and treating wastewater in an efficient manner whilst maintaining financial sustainability.

Consequently, the current business model poses serious challenges if the Authority is to seek to reengineer itself by introducing new and contemporary water management technologies into its operations. This applies equally to the weaning or sourcing of water, the production of potable water to satisfy both residential and industrial uses, development of its transmission systems, improving its distribution capacity to its stakeholders, and the timely and satisfactory treatment of wastewater.

The Government must give serious consideration to the risks that emerge in attempting to alter, modify or renegotiate the current industrial relations framework as it considers the future of WASA and the entire Water Management System of T&T.

Successful transformation of WASA into an organization that is reflective of the growing sophistication of the public will require on-going in-depth analysis and due diligence. There is no doubt that for an interim period, in support of the transition, the State will have to purchase/engage

in water management capability. The transition must be predicated on new technologies that will assist the Authority in adopting a sound balance between production/engineering and demand management. The establishment of a new organisation should be imperative. A new start will allow for a greater business-orientation, new engagement in public ownership through changed water use, and workforce arrangements that are more in line with the service demands of the entire country.

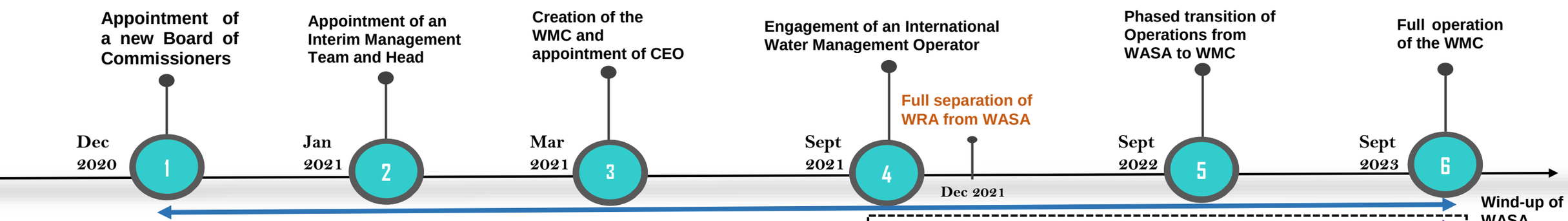
APPENDICES

APPENDIX I

Appendix I

TRANSITION TO A NEW WATER MANAGEMENT CORPORATISED MODEL

Phased Transition of WASA to the Water Management Company (WMC) (Approximately 3 years)



Board to:

- Select new Interim Management Team (IMT) and Head.
- Oversee Procurement of required International Expertise (IE) inclusive of an International Water Management Operator (IWMO).
- Establish targets for the IMT and IE.
- Function as Board to WMC until fully operational.
- Establish performance based reporting system for IMT and IE.
- Oversee WASA transition to the WMC.
- Oversee the wind-up of WASA.

Interim Team to:

- Work with the Board in the transitioning process.
- Stabilise WASA averting further decline:
  - Identify crisis areas and solutions to improve water supply to at least 24/2.
  - Stop financial haemorrhaging
  - Improve customer contact points
- Set the foundation for the transition of WASA to WMC.
- Establish new project management systems.
- Procure IWMO and other IE to support NRW reduction and audits.
- Commission audits of HR, Assets, Financials, Organisational Structure, Operational Systems and Technology.
- Explore Private Sector opportunities in wastewater management and elements of the water value chain.
- Develop a roadmap to remove the country's reliance on desalinated water, particularly in the area of potable water.

International Expertise to:

- Guide/Support CEO and IMT in the establishment of the WMC.
- Guide the strategic work for the establishment of the WMC.
  - Organisation Structure
  - Staffing
  - Technology etc.
- Establish guidelines for the phased transition of WASA to WMC.
- Conduct training and capacity building.
- Operate on the basis of a Performance Based Contract (PBC).

Strategic Pillars

Stabilise Operations & Build Public Confidence

Improve Operational Efficiency & Customer Service

Strengthen Financial Management

Restructure the Water Sector

APPENDIX II

SCHEDULE FOR THE IMPLEMENTATION OF CRITICAL ACTIONS

STRATEGIC PILLAR 1: STABALISE THE OPERATIONS OF WASA AND BUILD PUBLIC CONFIDENCE IN THE OPERATIONS OF THE WATER SECTOR AND GOVERNMENT'S STRATEGIC INTENT

Critical Steps	Years								
	Year 1 (2021)							Years 2-3 (2022-2023)	
	Urgent Actions (0-6 months)								
	M1	M2	M3	M4	M5	M6	M7-12	Y2	Y3
1. Develop a statement of policy intent with strategic targets handed down from the Government to the Board.									
2. Establish a performance agreement and timelines for the Board to achieve the Government's policy intent.									
3. Develop a performance management system for WASA's Interim Head and in turn the Interim Management Team									
4. Undertake the Legislative work for repeal of WAS Act									
5. Appoint a new Interim Head and Interim Management Team that reports directly to the Board.									
6. Undertake an analysis of the current water supply situation, identify crisis areas and solutions to provide a minimum of 24/2 water supply.									
7. Establish the Water Management Company and appoint the CEO.									
8. Develop and implement a reporting system between (i) the Interim Head of WASA, the CEO of the Water									

Critical Steps	Years								
	Year 1 (2021)							Years 2-3 (2022-2023)	
	Urgent Actions (0-6 months)								
	M1	M2	M3	M4	M5	M6	M7-12	Y2	Y3
Management Company and the Board, and (ii) the Board and the Minister that includes frequent communication to the national community on progress with the strategic intent.									
9. Remodel WASA's call centre to increase the percentage of calls answered and link call centre agents with operations information.									
10. Remodel WASA's Regional Customer Service Centres to improve information availability in order to resolve customer queries.									
11. Execute Road Restoration through the Ministry of Works and Transport.									
12. Complete and publish on WASA's website financial audited statements and annual performance reports until FY 2019.									
13. Develop and implement: (i) an effective communications strategy that addresses operational issues and issue regular (quarterly and annual) communication and (ii) a broad-based Transition Communications Strategy that informs, educates and influences all stakeholders of the transition to a new and productive water management sector.									

STRATEGIC PILLAR 2: IMPROVE OPERATIONAL EFFICIENCY AND CUSTOMER SERVICE

Critical Steps	Years								
	Year 1 (2021)							Years 2-3 (2022-2023)	
	Urgent Actions (0-6 months)								
	M1	M2	M3	M4	M5	M6	M7-12	Y2	Y3
1. Identify and prioritise a list of communities that are (i) under-served: receiving water less than 2 days/week, and (ii) unserved: receiving no water.									
2. Implement new project management systems and identify and execute priority capital projects (new and existing) to be undertaken and appoint NIDCO as executing agency									
3. Appoint an independent technical team to undertake a full assessment/audit of WASA's water supply and wastewater assets. The team should locate, assess and verify the usefulness and ownership of the asset.									
4. Undertake groundwater well rehabilitation works in under-served communities.									
5. Identify and execute a no-regret well drilling programme across T&T prioritising the supply of water to communities identified at (1) and availability of sustainable groundwater resources.									
6. Execute a programme of operational improvements to increase the efficiency of the Operations Division including systems reengineering, technology use, information									

Critical Steps	Years								
	Year 1 (2021)							Years 2-3 (2022-2023)	
	Urgent Actions (0-6 months)								
	M1	M2	M3	M4	M5	M6	M7-12	Y2	Y3
systems, equipment upgrade and data management.									
7. Implement a national rainwater harvesting programme to install 100 to 200 systems across 10 unserved and under-served communities (10 to 20 systems/community).									
8. Review and revise the systems, processes and standard operating procedures in all areas of WASA's operations.									
9. Engage an independent technical team of experts to gather data and develop the scope and targets of a performance-based contract (PBC) for an international management operator.									
10. Select 2 demonstration areas (1 in Tobago and 1 in Trinidad) to implement the DMA approach to provide 24/7 supply using the priority list at (1) above. Use the independent technical team of experts with a carefully selected group of staff in WASA to execute. Monitor, track and report on progress of implementation of DMAs and results.									

Critical Steps	Years								
	Year 1 (2021)							Years 2-3 (2022-2023)	
	Urgent Actions (0-6 months)								
	M1	M2	M3	M4	M5	M6	M7-12	Y2	Y3
11. Procure the services of an International Water Management Expertise under a Performance Based Contract/s (PBC) using the services of the independent technical team and other independent transaction advisors. The main target of the PBC would be to increase 24/7 supply through: (i) DMA installation with pressure management gauges, (ii) modernised leak repair, (iii) metering of WASA's production facilities and network (bulk), (iv) strategic pipe replacement and (v) installing customer meters while updating WASA's customer database and replacing service connections to allow for simple lock-off of supply. The approach should be one of co-management between PBC and high-performing management and staff to inject lean systems and new technology into WASA's operations of its production, transmission, distribution and customer service.									
12. Explore private sector investment opportunities to inter alia (i) construct multi-purpose reservoirs to increase water storage and flood mitigation, (ii) manage the wastewater sector and (iii) improve billings and collections.									

Critical Steps	Years								
	Year 1 (2021)							Years 2-3 (2022-2023)	
	Urgent Actions (0-6 months)								
	M1	M2	M3	M4	M5	M6	M7-12	Y2	Y3
13. Identify and prioritise the wastewater facilities to be upgraded across the country based on non-compliance with the Water Pollution Rules, separate these facilities into WASA-owned, Government-owned (others such as HDC) and privately owned.									
14. Develop a sequenced capital programme of works to address all other operational water and wastewater problems.									
15. Employ behavioural interventions to reduce customer consumption.									

STRATEGIC PILLAR 3: STRENGTHEN FINANCIAL MANAGEMENT

Critical Steps	Years								
	Year 1 (2021)							Years 2-3 (2022-2023)	
	Urgent Actions (0-6 months)								
	M1	M2	M3	M4	M5	M6	M7-12	Y2	Y3
1. Review the business case for a tariff increase and once approved by the RIC remove the corresponding Government subsidy.									
2. Reengineer and modernise WASA's billing and collection system.									
3. Revise by-laws and regulations to increase penalties for breaches such as water theft (trucking and connections) and hose pipe bans under the existing WAS Act.									
4. Roll out a national voluntary meter installation programme.									
5. Undertake a detailed validation exercise of WASA's liabilities (recorded, unrecorded and on Government books).									
6. Rationalise WASA's expenditure to separate core services from non-core services, and assess the cost-effectiveness of subcontracting certain functions.									
7. Reduce personnel expenditure through attrition, voluntary separation packages and negotiations with the Unions.									

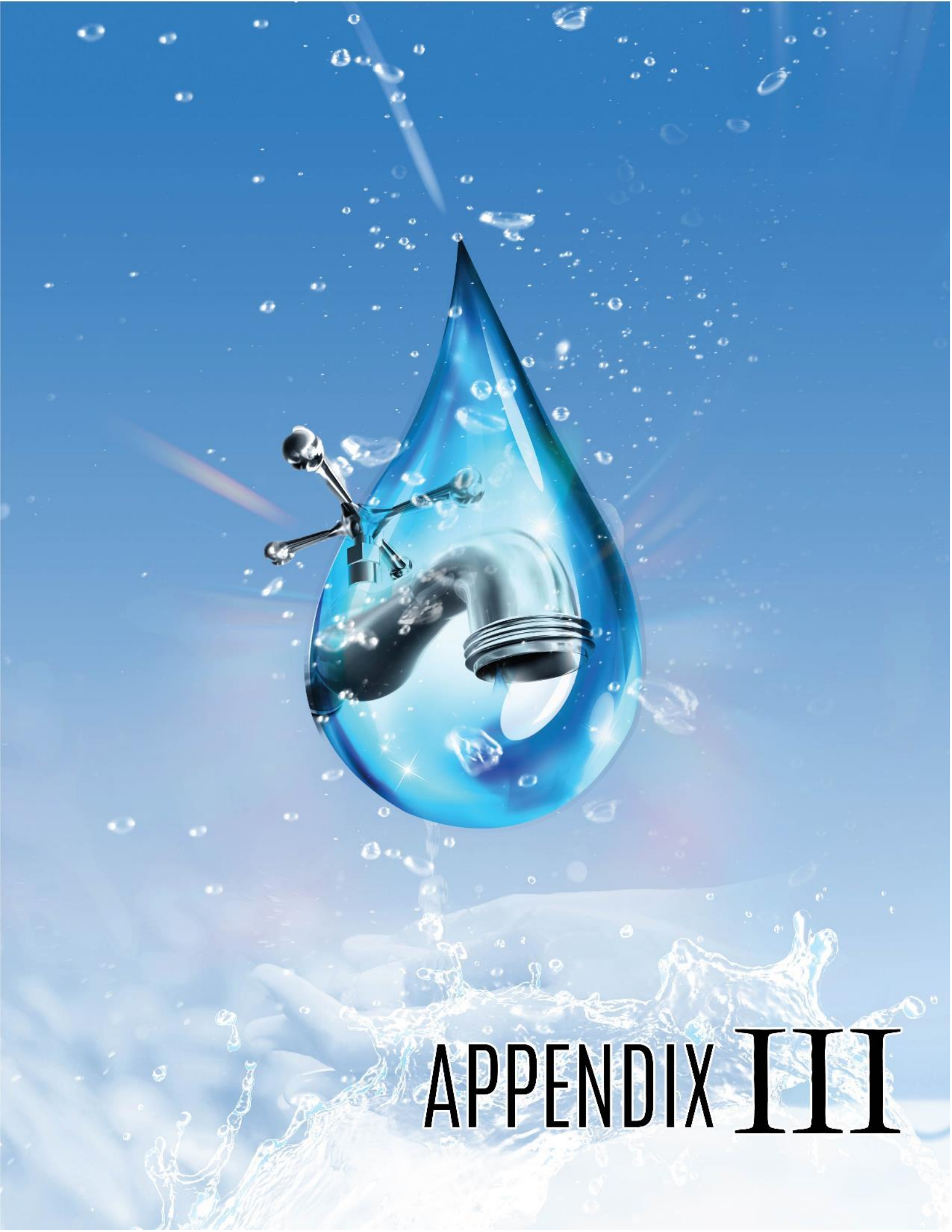
Critical Steps	Years								
	Year 1 (2021)							Years 2-3 (2022-2023)	
	Urgent Actions (0-6 months)								
	M1	M2	M3	M4	M5	M6	M7-12	Y2	Y3
8. Revamp WASA's accounting system to centralise the flow (and control) of money into and out of the organisation.									
9. Restructure WASA's system of project accounting to allow for the timely processing of invoices.									
10. Review all existing contracts for goods and services, materials and supplies, rental/lease of property, vehicles and equipment to ensure that value for money is being obtained.									
11. Review WASA's procurement system to ensure alignment with the new procurement regime and proper checks and balances.									
12. Review WASA's system of inventory control and management from the purchase of supplies, parts, equipment etc. to receipt, storage and distribution.									
13. Renegotiate part payment of desalination bill from US$ to TT$.									
14. Develop a roadmap to remove the country's reliance on desalinated water, particularly in the area of potable water									

STRATEGIC PILLAR 4: RESTRUCTURE THE WATER SECTOR

Critical Steps	Years								
	Year 1 (2021)							Years 2-3 (2022-2023)	
	Urgent Actions (0-6 months)								
	M1	M2	M3	M4	M5	M6	M7-12	Y2	Y3
1. Approve the Integrated Water Resources Management (IWRM) Policy.									
2. Implement the institutional and legislative reforms required to effect IWRM, specifically removing the functions of water resources management from WASA.									
3. Implement a public policy that defines the elevation and distance limits of new developments from WASA's water and wastewater networks, and stipulates capital contribution requirements for any new connections (private and public) beyond those limits.									
4. Finalise and publish the quality of service standards for water and wastewater services.									
5. Develop a reporting framework for the strategic targets of the RIC to the Parliament/President.									
6. Establish a task force of regulators to review, advise and approve physical development, separately for both islands.									
7. Review the legislation of all regulators with influence on the water sector – TCPD, Local Government, RIC, Drainage, EMA, etc.									

Critical Steps	Years								
	Year 1 (2021)							Years 2-3 (2022-2023)	
	Urgent Actions (0-6 months)								
	M1	M2	M3	M4	M5	M6	M7-12	Y2	Y3
8. Conduct a risk management exercise that addresses the inherent risks in all aspects of the transitioning process									
9. Develop and implement a Transition Framework and Strategy over a period of approximately three (3) years that address the key enablers for the development of the new water sector management model.									
14. Appoint independent technical teams to conduct audits – HR, Assets, Technology, Operational Systems and Organisation Structure.									
15. Identify transitional and permanent staff; create the organisational structures with role definition and process maps for the new water utility.									
16. Source an appropriate mix of government-to-government arrangements and multilateral funding (grant and loan resources) to finance improvements in water supply to the population, the establishment and operationalising of the new model for the water sector and the transition arrangements.									

Critical Steps	Years								
	Year 1 (2021)							Years 2-3 (2022-2023)	
	Urgent Actions (0-6 months)								
	M1	M2	M3	M4	M5	M6	M7-12	Y2	Y3
10. Create the new water utility under the Companies Act.									
11. Develop and execute a work plan for the transfer of assets and dissolving of WASA									



APPENDIX III

PRIORITY 2-YEAR INFRASTRUCTURE INVESTMENT PROGRAMME

A portfolio of priority investments has been identified for implementation over the next 24 month period at a cost of $209.6Mn. to improve the level and reliability of service to customers in targeted areas. The portfolio comprises:

- Development of 14 new wells and rehabilitation of 13 existing wells at a cost of $58Mn.
- Exploratory work in 10 areas for the development of new well sites at a cost of $3 Mn.
- Replacement/ Upgrading of Pipelines at a cost of $133Mn.
- Installation of Flow Meters and Loggers at a cost of $15.5Mn

I. WELLS DEVELOPMENT AND REHABILITATION

New wells and wells which require rehabilitation have been identified as localized sources of additional water to improve the level of water supply in communities. The benefits to be derived from these wells will accrue within a 6 to 12-month period. The 14 new well sites have already been investigated and determined to be feasible by the Water Resources Agency. In addition, land ownership has been determined and permission obtained to use the sites. The wells have been grouped by Regions showing the communities to benefit, population, impact and cost.

North East – Arima and Environs

Two new wells and 1 existing well are targeted for the Arima area which will add approximately 3429 cubic meters per day of new water:

- Development of the new Arima #14 well to improve supply to Beckles Lane and the Arima Old Road West of Beckles Lane.
- Development of the new Arima #15 well to improve the supply to persons along Bye Pass Road and environs. These persons currently experience a 24/2 level of service and will move to at least 24/4.

- Rehabilitation of Arima #13 located on Subero Street to improve the level of service provided within the Borough of Arima.

North East – Sangre Grande, Valencia and Environs

- Rehabilitation of 4 wells in the Sangre Grande Area, which will reduce the reliance on the North Oropouche WTP, and allow persons on the extremity of that system to enjoy an improved supply from 24/2 to 24/3. These four projects will add approximately 9572 cubic meters per day.
- Development of 1 new well and rehabilitation of 1well in the Aripo area i.e. Aripo #2 and ETI Valencia. These 2 wells are expected to add an additional 3606 cubic meters per day and benefit the residents in Aripo, Valencia and environs. These residents experience significant reduction in their level of service during the dry season. These wells will ensure a 24/7 supply is maintained in the dry season.

`-

North East – Piarco

- Development of 4 new wells in the vicinity of Oropune Gardens i.e. Piarco #8, 9, 10, and 11 with an expected yield of approximately 1356 cubic meters per day. Oropune Gardens is at the end of the North Oropuche System and suffers from an inconsistent supply of water which on average is 24/2. These wells will result in a 24/7 supply for these residents.

North West – Moka and Carenage

- Development of 2 replacement wells in the Moka area i.e. replacements for Moka #1 and #2. These wells are more than 50 years old and though they are steady producers, additional water can be harnessed from newer structures. These new wells will produce an additional 1192 cubic meters per day and improve the service in the Moka area from 24/3 to 24/4.
- Rehabilitation of 3 wells in the Tucker Valley Wellfield (#15, #17 and #30) to increase well production by approximately 2146 cubic meters per day. This additional water in combination with other ongoing work in the Carenage area will ensure that the minimum level of service in that area will move from 24/2 to 24/4.

South – Las Lomas

- Development of two new wells in the Las Lomas wellfield (#9 and #8), to replace wells that have either stopped producing or reduced production significantly.

These two new wells are expected to produce a total of 3000 cubic meters per day.

- Rehabilitation of two wells in that wellfield (#10 and #11) with a projected yield of an additional 1345 cubic meters per day.

The water from these wells will be treated at the Las Lomas Water Treatment Plant and is expected to increase the level of service to residents of Las Lomas#1 Rd, Las Lomas#2, Las Lomas#3, Boy Cato Rd, Kernahan Rd, Madras Rd, Mahaica Village, Governor Rd, Salvary Rd, Kallian Rd, Ramoo Rd and Upper Chin Rd. Service levels will move from 12/2 to 24/4.

South – Chatham- Granville

- Development of a new well in Bobby Trace, Chatham. The Chatham field has been under investigation for the last year or so, due to observed instances of high chlorides at some of the production wells. Based on the recent studies, WRA has given the "green light" for the drilling of this well. This well is expected to produce 980 cubic meters per day and improve the supply to the residents of Chatham from 24/2 to 24/4.
- Rehabilitation of three wells in the Granville wellfield. These wells will add an additional 703 cubic meters per day and improve the service to the residents of Granville from 24/2 to 24/4.

Tobago – Mary's Hill and Roxborough

- Development of two new wells in the Mary's Hill and Roxborough areas producing 2,727 and 3,182 cubic meters per day, respectively. These wells are expected to improve the level of service in the Mary's Hill and Roxborough areas from 24/3 to 24/7. Production from the Roxborough well will also buffer the reduction in supply experienced at the Richmond water Treatment Plant during the dry season, and ensure a 24/7 supply is maintained.

II. AQUIFER EXPLORATION

Several areas have been identified for the conduct of exploratory work by WRA, over the next 6 months, to identify new well sites. Based on the outcome of the exploratory work, a subsequent programme of well drilling works will be developed. The 10 areas targeted for exploration are as follows:

Siparia/Palo Seco/Carapal

Clarke Road/Scotts Road

North Manzanilla/Camparo

Guaico Tamana/Coalmine

Brazil/Carmichael

Lopinot Road

Maracas Valley

El Socorro/Glenn Lane

Chaguaramas

Speyside/Kings Bay/Charlotteville

If WRA is unable to locate well sites in Speyside, Kings Bay and Charlotteville in Tobago, a Success Based Drilling Tender will be developed, for implementation in the second half of 2021.

III. SHORT TERM PIPELINE PROJECTS

Several critical pipelines in the transmission and distribution network have been identified for replacement and upgrade (Appendix II). These pipelines either record a significant burst frequency and leakage rate or they are now inadequately sized based on the increased demand and throughput. The pipeline replacement/upgrade programme will result in a reduction in water loss through leakage and cause general improvements in service levels throughout the country, especially at network extremities.

IV. FLOW METERS AND LOGGERS

The provision of flow meters and loggers are critical requirements in strengthening network management. They will enable measurement of system input volumes and network pressures and facilitate better management of water distribution systems. Additionally, Water Supply Managers will be able to produce real time production reports and District Managers will be continuously updated on the level of service in their respective supply and schedule zones.

The cost of producing water can also be accurately quantified, leading to better demand management of the scarce water supply, as well as improved decision making and management of financial resources. The data collected and analysed will also support WASA in its submission to the Regulated Industries Commission (RIC) for a tariff review.

The flow meters and loggers will serve as a precursor to the wider Bulk Metering and District Metered Area (DMA) Programmes. The scope of the programme comprises (i) bulk metering in the Tobago and North East Regions since these regions already have good coverage with respect to Source meters; (ii) a significant number of source meters in the South Region; and (iii) limited Source meters in the North West Region which already has underway a bulk metering programme to install 26 meters.

Appendix I

Region	Area	Type	Well Name & No.	Anticapated Volume gain (m^3/day)	Area that will benefit	Number of people to benefit	Current level of service	Projected level of service	Cost
North East	Arima	New Well	Arima # 14 **	1310	Constituency of Arima Maturita, Santa Rosa, Lynton	6550	24/3	24/4	$2,441,185.00
		New Well	Arima # 15	1310					$2,855,085.00
		Rehabilitation	Arima #13	809	Constituency of Arima Arima Old Road, Lynton Gdns, Clever Heights	2022	24/3	24/4	$2,855,085.00
		New Well	Aripo #2	1334	Maturita, Santa Rosa, Valencia, Quare, KP Lands	3335	24/3	24/4	$2,634,435.00
		Rehabilitation	ETI Well (Valencia)	2272	Constituency of Arima Valencia	5680	0		$2,304,885.00
	Arouca	New Well	Piarco # 8	339	Constituency of St Augustine, Oropune Gardens, Piarco, Trincity, Maloney, Five Rivers	3888	24/3	24/4	$2,675,735.00
		New Well	Piarco # 9	339					$2,556,960.00
		New Well	Piarco # 10	339					$2,582,960.00
		New Well	Piarco # 11	339					$2,551,160.00
	Sangre Grande	Rehabilitation	Sangre Grande 1	2000	Constituency of Sangre Grande Plum Mitan, North Manzanilla, Mazanilla along the beach, Fishing Pond, Foster Road	23930	24/2	24/3	$800,635.00
		Rehabilitation	Sangre Grande 2	2300					$637,860.00
		Rehabilitation	Sangre Grande 3	3000					$769,010.00
		Rehabilitation	Sangre Grande 4	2272					$1,715,551.88
North West	Maraval	New Well	Moka 1 replacement	1192	Constituency of Port-of-Spain North, Maraval, Haleland Park, Moka, La Seiva	5960	24/4	24/4	$1,735,675.00
		New Well	Moka 2 replacement	1192					$1,567,575.00
	Carenage	Rehabilitation	Tucker Valley 15	505		5410	24/3	24/4	$423,232.00
		Rehabilitation	Tucker Valley 17	449					$426,132.00
		Rehabilitation	Tucker Valley 30	1192					$336,602.00
Sub Total North									**$29,428,577.88**
South Central	Las Lomas	New Well	Las Lomas 8 (replacement)	1080	Las Lomas#1 Rd, Las Lomas#2, Las Lomas#3, Boy Cato Rd, Kernaham Rd, Madras Rd, Mahaica Village, Governor Rd, Salvary Rd, Kallian Rd, Ramoo Rd, Upper Chin Chin Rd	6386	12/2	24/4	$2,308,035.00
		New Well	Las Lomas 9 (replacement)	1900					$2,021,000.00
		Rehabilitation	Las Lomas 10	720	Las Lomas#1 Rd, Las Lomas#2, Las Lomas#3, Boy Cato Rd, Kernaham Rd, Madras Rd, Mahaica Village, Governor Rd, Salvary Rd, Kallian Rd, Ramoo Rd, Upper Chin Chin Rd	6386	12/2	24/4	$456,802.00
		Rehabilitation	Las Lomas 11	625					$505,602.00
			Freeport # 12						
South West	Chatham	New Well	Chatham # 18	980	Bobby Trace, Chatham and environs	13449	24/1	24/4	$3,455,550.00
	Granville	Rehabilitation	Granville #13	209	Constituency of Point Fortin, Cedros, Bamboo, Bois Bourg, Coromandel, Fullerton, Icacos	5,675	24/2	24/3	$431,502.00
		Rehabilitation	Granville #7(11)	110					$516,002.00
		Rehabilitation	Granville #10	384					$479,902.00
Sub Total South									**$10,174,395.00**
Tobago East	Tobago	New Well	Roxborough	3181	Roxborough, Louis D'or	1860	24/4	24/6	$3,200,000.00
Tobago West			Mary's Hill	2727	Whim, Union, Mt. Grace, Idlewild, Mary's Hill	2952	24/4	24/6	$2,000,000.00
Total anticipated Volume (m3/day)				**34409**		**93483**			
Total Drilling Cost									**$44,802,972.88**
Total T&TEC electrical estimated Cost for drilled Wells									$2,000,000.00
Total Estimated Pipeline cost (10km)									$11,200,000.00
GRAND TOTAL									**$58,002,972.88**

***** Project already has funding and is about to kick off***

Appendix II

No.	Area	Town	PIPELINE DESCRIPTION Name/Location	Length (m)	Size (mm)	Description	Cost to replace	Total
1	Central	Kernaham	Kernaham Tr	489	100	Cross Country	$484,365.00	
2		Freeport	Sandiana Lane	260	100	Sandiana Lane	$289,000.00	
3		Freeport	Sandiana Lane	280	100	Sandiana Lane	$289,000.00	
4		Freeport	Indiantrail	1700	300	Cross Country	$3,300,000.00	
5		Freeport	Balmain	1800	300	Link Rd	$3,500,000.00	
6	South East	Tableland	Tableland 16" transmission main	14000	400	Torrib Tabaquite Rd and Watts Tr	$39,000,000.00	
7		Tableland	Naparima Mayaro Rd 8" Distribution line	15000	200	Naparima Mayaro Rd	$24,130,434.78	
8	South West	Penal	Mora Dam Rd 8" (raw water line)	900	200	Mora Dam Rd	$4,282,116.30	
20							***Sub-total***	**$75,274,916.08**
21	North East	Wallerfield	Replacement of 200mm main of Asbestos Pipe at Hamilton Sliding, Wallerfield	1000	200	Hamilton Sliding Wallerfield	$ 4,060,000.00	
22		Arima	Replacement of 700m of 50mm of encrusted main from Sanchez Street , Arima	700	50	Sanchez Street , Arima	$ 355,250.00	
23			Replacement of 700m of 75mm of encrusted main from Farfan Street , Arima	700	75	Farfan Street , Arima	$ 355,250.00	
24			Replacement of 500m of 50mm of encrusted main from Pro De Vertuil Street, Arima	500	50	Pro De Vertuil Street, Arima	$ 253,750.00	
25			Replacement of 300m of 75mm of encrusted main from De Graff Street , Arima	300	75	De Graff Street , Arima	$ 152,250.00	
26			Replacement of 500m of 75mm of encrusted main from Hollis Avenue, Arima	500	75	Hollis Avenue, Arima	$ 253,750.00	
27			Replacement of 300m of 125mm of encrusted main from St. Joseph Street, Arima	300	125	St. Joseph Street, Arima	$ 152,250.00	
							Subtotal	**$5,582,500.00**
29	North West	San Juan	Replacement of 4'' pipeline at 2nd, San Juan	630 m	100	2nd, San Juan	$794,252.84	
30			Replacement of 6" pipeline at Crossie, San Juan	500 m	150	Crossie, San Juan	$755,000.00	
31		Malick	Replacement of pipeline at 2nd St. Malick	270 m		2nd St. Malick	$544,735.60	
32		San Juan	Replacement of 6" pipeline at Saddle Road, San Juan (area has a high number break mains)	630 m	150	Saddle Road from Hunt Rd. to Real	$950,483.75	
33		Laventille	Replacemnt of 4" at Picton Rd., Laventille (area has a high number break mains)	1200 m	100	Picton Rd., from Pump Trace to Fat	$2,000,000.00	
34		El Socorro	Replacement of 4'' pipeline at Chootoo Rd., El Socorro	200 m	100	Chootoo Rd., El Socorro	$297,636.34	
35		Petit Valley	Install 1450 km of pipeline 8" Class E PVC along Morne Coco road from Corner Crystal Stream to Corner Cassia Drive	1450	200	Morne coco Road between Crystal Stream and Cassia Drive.	$4,645,037.00	
36		Diego Martin	Install 600 meters of 6" main along Bagatelle Rd from Sea Trace Junction to the end of Bagatelle Road	600	150	Bagatelle road	$540,000.00	
37		Diego Martin	Install 600 meters of 4" main along Quarry Rd from Diego Martin Main Road to the end of Quarry Road	600	100	Quarry Road	$480,000.00	
							Sub-total	**$11,007,145.53**

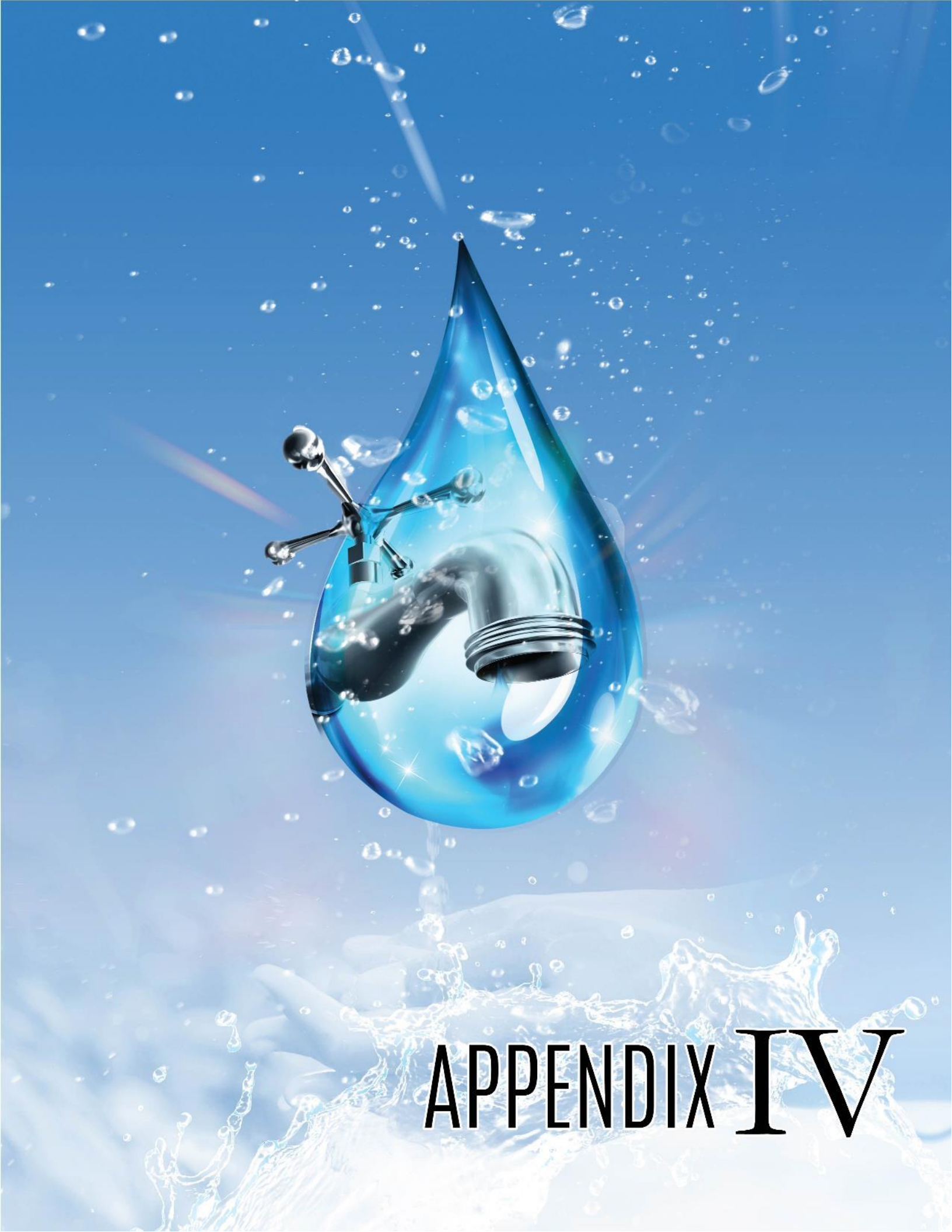
No.	Area	Town	PIPELINE DESCRIPTION				Cost to replace	Total
			Name/Location	Length (m)	Size (mm)	Description		
29		San Juan	Replacement of 4'' pipeline at 2nd, San Juan	630 m	100	2nd, San Juan	$794,252.84	
30			Replacement of 6" pipeline at Crossie, San Juan	500 m	150	Crossie, San Juan	$755,000.00	
31		Malick	Replacement of pipeline at 2nd St. Malick	270 m		2nd St. Malick	$544,735.60	
32		San Juan	Replacement of 6" pipeline at Saddle Road, San Juan (area has a high number break mains)	630 m	150	Saddle Road from Hunt Rd. to Real	$950,483.75	
33		Laventille	Replacemnt of 4" at Picton Rd., Laventille (area has a high number break mains)	1200 m	100	Picton Rd., from Pump Trace to Fat	$2,000,000.00	
34		El Socorro	Replacement of 4'' pipeline at Chootoo Rd., El Socorro	200 m	100	Chootoo Rd., El Socorro	$297,636.34	
35	**North West**	Petit Valley	Install 1450 km of pipeline 8" Class E PVC along Morne Coco road from Corner Crystal Stream to Corner Cassia Drive	1450	200	Morne coco Road between Crystal Stream and Cassia Drive.	$4,645,037.00	
36		Diego Martin	Install 600 meters of 6" main along Bagatelle Rd from Sea Trace Junction to the end of Bagatelle Road	600	150	Bagatelle road	$540,000.00	
37		Diego Martin	Install 600 meters of 4" main along Quarry Rd from Diego Martin Main Road to the end of Quarry Road	600	100	Quarry Road	$480,000.00	
							Sub-total	**$11,007,145.53**
38		St Anns	Install booster station in the compound of the Knaggs Hill reservoir and 1 km of express pipeline 8" PVC along Lady Chancelor road from Knaggs Hill reservoir compound to Poui ave lady Chancelor road and to utalise the chancelor tank	1100	200	Lady Chancelor, ST Anns,terracita, hutton road,mental hospital and the general area of St Anns also condemn the existing Terracita booster	$900,000.00	
39		Belmont	Install 500 meters 4" Main Chocolate Alley Gonzales to replace long services.	500	100	customers along Chocolate Alley ,Gonzales	350,000.00	
40		Woodbrook	300m Anna Street, Woodbrook.	300		Customers along Anna st woodbrook	$400,000.00	
41		St James	350m De Fraitas Street, St. James	350		Customers along De Fraitas St St Jamen	$500,000.00	
42		St James	Install 900 meters of 6" main at Forte George Road. St James	900	150	Customers along Fort George Road with Long srevices from rossland St James	$1,100,000.00	
43		Paramin	Install 1km of express pipeline from Paramin level 1 to Paramin level 2.	1000		regulate pressures to customers and reduce leakage to on the existing main from level 1 to level 2 extreemly high pressures above 300 psi	$1,500,000.00	
44	**North West Cont'd**	Paramin	Install 200 meters 4" main on Morne Rene Road, Paramin. Long services	200	100	removal of long services	$200,000.00	
45		Paramin	Install 500 meters 4" main on Balata Hill, Paramin Level 3.	500	100	removal of long services	$500,000.00	
46		Petit Valley	200 meters 4" main on Ravine Road, Petit Valley to replace long service	200	100	removal of long services	$200,000.00	
47		Diego martin	500 meters Mercer Road, Diego Martin with small boost	500		removal of long services	$500,000.00	
48		St Anns	300 meters Moore Ave. , St. Anns	300		regulate customers and reduce leakage Ave on the existing main Anns Moore 1 Ave Moore 5 extreemly high pressures above 300 psi	$300,000.00	
49		St Anns	300 meters Fisher Ave, St. Anns.	300		regulate customers and reduce leakage Ave on the existing main	$300,000.00	
50		St Anns	300 meters 4" PVC St. Anns Gardens, replace 4" CI	300	100	regulate customers and reduce leakage Gardens on the existing main PVC Anns 3 Gardens Anns 1 extreemly high pressures above 300 psi	$300,000.00	
51		Glencoe	2" Main in Bayshore on verge (Sunset Drive)	200	50	Customers Sunste Blvd. Bayshore	$200,000.00	
52		Glencoe	2" Main along Paria Avenue Shorelands on verge	300	50	customers on Paria ave	$300,000.00	
53								**$7,550,000.00**
54	**Tobago**	Carnbee	Bella Terrace, Sherwood Park, Carnbee	1,000	400		$1,315,076.88	
55		Signal Hill	Rojas Junction to Saint Luke Junction, Signal Hill	1,300	150	Along Orange Hill Road	$2,451,514.00	
56		Moriah	Broadroad Junction to King Peter's Bay Booster, Moriah	1,000	150	Along North Side Road	$1,885,780.00	
57		Concordia	Richard Trace to Concordia	300	150	Along North Side Road	$774,228.63	
58		Roxborough	Phase 3	16000	200		$20,890,000.00	
59		King's Bay	Phase 4 King's Bay Booster				$1,550,000.00	
60			Phase 5	300	150		$493,000.00	
61			Phase 6 Merchiston Booster				$598,500.00	
62		Canaan	Buck Buck Alley	150	100	Buck Buck Alley	$454,769.87	
63		Calder Hall	French Fort	200	100	French Fort	$285,176.00	
64		Carnbee	Corner of Auchenskeoch Rd and Shirvan Rd to Montgomery Junction	1035	300 100	Auchenskeoch Road	$2,971,609.01	
65							***Sub-total***	**$33,669,654.39**
							Grand Total	**$133,084,216.00**

Appendix III

Summary of Estimated Cost

Region	Plant Name/Offtake	Mag Flow Meter Size/Offtake Size	Estimated Cost $ (Material Only)
Tobago North	Chateau Booster	4”	$68,871.00
Tobago North	Signal Hill Booster	6”	$77,242.47
Tobago North	Mason Hill Booster	4”	$68,871.00
Tobago North	Government Farm Booster	6”	$63,867.39
Tobago North West	Bethel Booster (Montgomery)	6”	$70,826.26
Tobago South West	Arnos Vale Well 1	6”	$63,867.39
Tobago North West	Buccoo Offtake	8”	$78,505.07
Tobago North West	Plymouth Offtake	6”	$70,826.26
Tobago North West	Black Rock Offtake	6”	$70,826.26
Tobago South West	Crown Point Offtake	8”	$126,449.04
Tobago North East	Fort George Reservoir Inlet	8”	$166,939.73
Tobago North East	Green Hill Reservoir Outlet	8”	$73,678.07
Tobago North East	Craig Hill Well	6”	$63,867.39
Tobago South West	Shrivan Road Offtake	6”	$70,826.26
Tobago North West	Bad Hill Tanks (Inlet)	8	$126,449.04
Tobago North	Calder Hall Well	4”	$57,383.39
Tobago North	Bacolet Well 5	4”	$56,867.39
Tobago North West	Mary’s Hill	4”	$56,867.39
Tobago South	Bacolet Depleche	4”	$56,867.39
Tobago North	Hillsborough Dam 8”	8”	$70,826.26
Tobago South	Tobago Plantations	4”	$56,867.39
Tobago North	Orange Hill	6”	$63,519.46
Tobago North	Bacolet Street	8”	$73,678.07
Tobago North East	Highland WTP	4”	$56,867.39
Tobago South	Milford Road	8”	$72,531.85
Tobago South	Bacolet Extension Road	8”	$72,531.85
Tobago South	Lambeau	4”	$56,867.39
Tobago North	Mt. Marie Road Ext.	4”	$56,867.39
Tobago North	North Side	4”	$54,998.09
Tobago South	Wilson Road	4”	$54,998.09
Tobago North North East	Speyside	4”	$56,867.39
Tobago North North East	Delaford	4”	$56,867.39
Tobago North North East	Bloody Bay (2 8”)	8”	$147,356.14
Tobago North North East	Bloody Bay (6”)	6”	$57,383.39
Tobago South	Fort George Reservoir Outlet	8”	$73,678.07

Region	Plant Name/Offtake	Mag Flow Meter Size/Offtake Size	Estimated Cost $ (Material Only)
Trinidad North East	North Oropouche	42"	$488,000.00
Trinidad North East	Tompire WTP	8"	$66,430.00
Trinidad North East	Matura WTP	6"	$55,220.00
Trinidad North East	Aripo WTP	18"	$76,550.00
Trinidad North East	Arouca WTP	6"	$55,220.00
Trinidad North East	Caura WTP	4"	$36,300.00
Trinidad North East	Tacarigua Highlift	12"	$130,820.00
Trinidad North East	Guanapo WTP	12" & 10"	$231,590.00
Trinidad North East	Sangre Grande Booster	8"	$66,430.00
Trinidad North East	Coalmine Booster	6"	$55,220.00
Trinidad North East	Valencia Offtake	12"	$130,820.00
Trinidad North East	Gills View Offtake	6"	$55,220.00
Trinidad North East	O'Meara Main	12"	$130,820.00
Trinidad North East	Quesnel-Proqueen Offtake	12"	$130,820.00
Trinidad North East	Quesnel-Moreno Offtake	6"	$55,220.00
Trinidad North East	O'Meara Offtake	8"	$66,430.00
Trinidad North East	Olton Road Offtake	(2) 6"	$132,790.00
Trinidad North East	Boys Lane Offtake	8"	$66,430.00
Trinidad North East	Mausica Offtake	6"	$110,440.00
Trinidad North East	La Resource 1 Offtake	8"	$66,430.00
Trinidad North East	La Resource 2 Offtake	4"	$36,300.00
Trinidad North East	Arima Old Road	6"	$55,220.00
Trinidad North East	Lopinot Road Offtake	12" & 6"	$186,040.00
Trinidad North East	Backaday Offtake	12"	$130,820.00
Trinidad North East	Sangre Grande Town Centre	16"	$201,280.00
Trinidad North East	Signature Park	4"	$36,300.00
Trinidad North East	O'Meara North	8"	$66,430.00
Trinidad North East	Tumpuna Road North	12"	$130,820.00
Trinidad North East	Tumpuna Road South	12"	$130,820.00
Trinidad North West	Santa Cruz WW North	8"	$53,000.00
Trinidad North West	Santa Cruz WW South	8"	$53,000.00
Trinidad North West	Maraval WTP North	6"	$47,000.00
Trinidad North West	Maraval WTP South	8" & 4"	$93,000.00
Trinidad North West	Moka well #5	4"	$40,000.00
Trinidad North West	Coblentz A BPS	8"	$53,000.00
Trinidad North West	Valsayn Highlift	12"	$90,000.00
Trinidad North West	El Socorro BPS	Insertion (36")	$67,000.00
Trinidad North West	El Socorro Highlift	Insertion (30")	$67,000.00
Trinidad Central	Freeport WTP	12"	$90,000.00
Trinidad Central	Carlsen Field WTP	12"	$90,000.00
Trinidad Central	Caparo Well # 2	6"	$47,000.00
Trinidad Central	Caparo Well # 3	4"	$40,000.00
Trinidad Central	Ravine Sable Well #1	4"	$40,000.00
Trinidad Central	Freeport Todd's Well #18	6"	$47,000.00
Trinidad Central	Freeport Todd's Well #19	6"	$47,000.00
Trinidad South East	Stonebright Final	4"	$40,000.00
Trinidad South East	Mayaro Final	4"	$40,000.00
Trinidad South East	Navet Inlet to clearwell	Insertion (36")	$67,000.00
Trinidad South East	Navet Filter service	Insertion (24")	$67,000.00
Trinidad South East	Trinity Raw water	6"	$47,000.00
Trinidad South West	Penal WTP	8"	$53,000.00
Trinidad South West	Fyzabad WTP	6" & 6"	$94,000.00
Trinidad South West	Siparia WTP	8"	$53,000.00
Trinidad South West	Carapal WTP	4" & 4"	$80,000.00
Trinidad South West	Chatham WTP	8" & 8"	$106,000.00
Trinidad South West	Granville WTP	8"	$53,000.00
Trinidad South West	Techier WTP	6" & 6"	$94,000.00
Trinidad South West	Cap-de-Ville WTP	4" & 4"	$80,000.00
Trinidad South West	Point Fortin WTP	6" & 6"	$94,000.00
	2 Channel Data Loggers with	350	$4,550,000.00
	Digicel 2G/3G prepaid Sim Cards	105	$630,000.00
	Meter and logger Training		$100,000.00
	Spare Batteries for Mag Meters	70	$560,000.00
	Appurtenances and material		$2,000,000.00
	Total		**$15,525,833.80**



APPENDIX IV

The Case for the Timely Review of Electricity,

Water, and Wastewater Rates

The Regulated Industries Commission Act provides for the review of electricity, water and wastewater rates every five (5) years, or every year on the request of the service provider where there are fundamental changes in the circumstances. This however has not been the experience. Since its establishment in June 2000, some twenty (20) years ago, the RIC has only completed one (1) rate review, and that was for T&TEC in 2006. This is notwithstanding that several rate reviews have been launched over the years, but the outcomes have not had a Final Determination.

The Rate Review Process

When reviewing the principles and methodologies for determining rates and charges for services, the RIC is required to consult with service providers and representatives of relevant consumer interest groups and other key stakeholders. In the determination of rates, the RIC uses a Revenue Cap Regulation which seeks to limit the amount of total revenue that can be earned while promoting efficiency gains in production. In this regard, in setting the rates cognizance is taken of the following:

- least-cost operating expenditure (Opex[56] and Capex)
- recovery of replacement capital cost expenditure
- recovery of return of capital
- affordability of consumers
- quality of service
- incentives to pursue efficiency and to promote the sustainable use of resources

The rate review process entails three (3) essential steps: (i) establishing the quality of service standards (QSS) that the utility is expected to meet during the control period; (ii) assessing costs to derive a revenue requirement for delivery of the desired level of service; and (iii) determining tariffs to meet the revenue requirement and the mechanism for controlling changes in the tariffs over the control period.

[56] The use of a RPI-X^1 is used in forecasting efficient Opex where RPI is the Retail Price Index and "X" is a productivity factor determined by the RIC

At the completion of the rate review process, the RIC prepares a Final Determination document which provides full details of the pricing methodology and all obligations to be met by the service provider, including quality of service. It also evaluates the impact of the rates on affordability and competitiveness. The Final Determination is submitted to the Ministry of Public Utilities for the purpose of securing Cabinet's approval prior to the Final Determination being gazetted. Once it receives the Cabinet's imprimatur, the document is published on the RIC's website.

The RIC has given a timeline of between 353 to 365 days for completing the process as outlined in the **Table1** below. However, the attainment of these timelines are critically dependent on the responsiveness of T&TEC, WASA and the Ministry of Public Utilities to requests for information and securing necessary approvals.

It should be noted, however, that the RIC has no jurisdiction in determining the timeframe for implementation of the approved rates, this is the prerogative of the Government.

Table 1 Timelines for Price Review

Major Activity	**Timeline for Completion in Days**	
	T&TEC	WASA
Request Draft Business Plan & Publish and consult on its Consultative documents	1-44	1-44
Submission of Draft Business Plan	45	45
RIC's assessment of draft Business Plan and submission of Final Business Plan by service provider and preparation of the Draft Determination	46-202	46-202
Board approval and publication of Draft Determination	203-236	203-230
RIC Consults on Draft Determination	237-297	231-290
Assessment of consultation feedback and publish Final Determination	298-353	291-365
Total	**353 Days**	**365 Days**

Service Quality Regulation

An important component of the rate review process is the establishment of QSS by the RIC. These are documented minimum standards of service that the utilities are expected to provide to customers. For QSS to be instituted, they must be gazetted. Defaulting on these standards, creates an opportunity for customers to seek redress, firstly through the service providers, and ultimately through the RIC. However, enforcement by the RIC has been weak.

The QSS developed by the RIC is based on a Guaranteed Standards Scheme consisting of two sets of standards; (i) the guaranteed, and (ii) the overall. The Standards cover three broad service quality attributes; reliability, technical quality and customer service. Guaranteed standards set service levels that must be met in the provision of service to each individual consumer. Failure to meet guaranteed standards requires compensation to be made to the affected customer. The Overall Standards cover areas of service where it is not appropriate or feasible to give individual guarantees, but where the expectation is that the utility will provide pre-determined, minimum levels of service.

In designing the QSS, the RIC takes the following factors into account:

- Performance of the service provider
- Performance of similar utilities (external benchmark)
- Customer preferences
- The financial implications for the service provider with respect to payment of compensation

Ideally, the QSS should be in place before the rates are reviewed so as to ensure alignment between the determined rate and the quality of service to be provided. Customers would then be aware of the service for which they are being charged. Once these standards have been implemented, they will generally be reviewed every three years to ensure that they continue to set the appropriate standard of service to be provided to customers.

QSS pertaining to WASA have yet to be instituted by the RIC. Following a process of public consultation that began in 2003 and culminated with a National Consultation in 2004, draft QSS were published and launched in 2005. However, WASA, whose representatives participated in

the consultations, found the Standards to be too onerous and as a result, they were never gazetted and therefore died a natural death.

After a 12-year hiatus, the RIC commenced a new round of public consultations on revised QSS in August 2017 and a Final Decision Document was published in December 2017. This Document proposed 18 standards; nine (9) Guaranteed and nine (9) Overall (**see Appendix 1**). A moratorium was granted for five (5) of the standards to allow WASA time to bring its performance up to the requisite level. In this regard, WASA was required to submit an action plan detailing steps that will be taken and timelines to enable implementation of the standards. This is still outstanding. The QSS have not yet been gazetted.

The QSS were benchmarked against standards from the Office of Water Services United Kingdom**,** and the Office of Utilities Regulation Jamaica (see **Annex 1)** and were found to be generally more stringent in terms of the scope of coverage**.** There was no clear trend in terms of the requirements of the standards, with some of the RIC requirements being more stringent while others were less.

QSS pertaining to T&TEC have been instituted since 2004, and were revised in 2009. In 2018 new QSS were developed and gazetted, which included eight (8) Guaranteed standards and six (6) Overall (**see Annex 2**). A new Order is being published to correct a definitional error in the gazetted QSS.

The Rate Review Experience

It is extremely important that the review of rates be done relatively frequently so that the rates can reflect inflation and increases in cost. This is critical to ensuring that the utilities have sufficient funds to achieve and maintain the stipulated levels of performance. Also, an overdue price review is likely to undermine the RIC's efforts in setting and enforcing standards, as additional revenue may be needed to fund improvements in quality of service.

With the exception of industrial customers at the Point Lisas Estate[57], the current rates being applied by WASA were set in 1993 by the Public Utilities Commission, the precursor to the RIC.

[57] In 1998, a special water improvement rate was applied to industrial customers at Point Lisas which was further adjusted in 2012.

Over the years, the RIC has made several attempts to review water and wastewater rates, but none has resulted in a Final Determination. In this regard, in 2007 the RIC initiated a price review of WASA, which resulted in the preparation of a Draft Determination in 2008 which was updated in 2011 and again in 2013. However, these rates were never published. In September 2017, the RIC again officially launched another Rate Review which has been at a virtual standstill awaiting the submission by WASA of an approved Business Plan for the control period 2018-2023. The delay in the submission of an approved Business Plan is largely reflective of WASA's weak internal capacity to prepare business plans. In this regard, a draft plan was prepared and was found to be very deficient in its information requirements and had to be revised. A consultant was contracted by WASA to prepare a revised plan which has been completed and is to be reviewed for submission to Cabinet.

The efforts of the RIC to effectively discharge its statutory obligation for the timely review of electricity, water, and wastewater rates as envisioned under the RIC Act have been constrained by several factors, not the least of which is the lack of responsiveness by State Agencies for requests for information. Capacity constraints, the absence of credible cost data, and up-to-date audited accounts have also contributed to the problem. Delays have also been experienced in securing requisite approvals and the gazetting of documents. However, the RIC is not entirely without blame, as it should have developed the in-house capacity for undertaking research which is provided for under the RIC Act through the establishment of an Office for Research.

Consequences of Low Rates

The lengthy delays in reviewing rates have meant that the current utility rates for electricity, water, and wastewater have lagged significantly behind costs, and are therefore unrealistic. It is not surprising that Trinidad and Tobago's rates are among the lowest in the region. (**See Charts 1 and 2 below).**

Chart 1

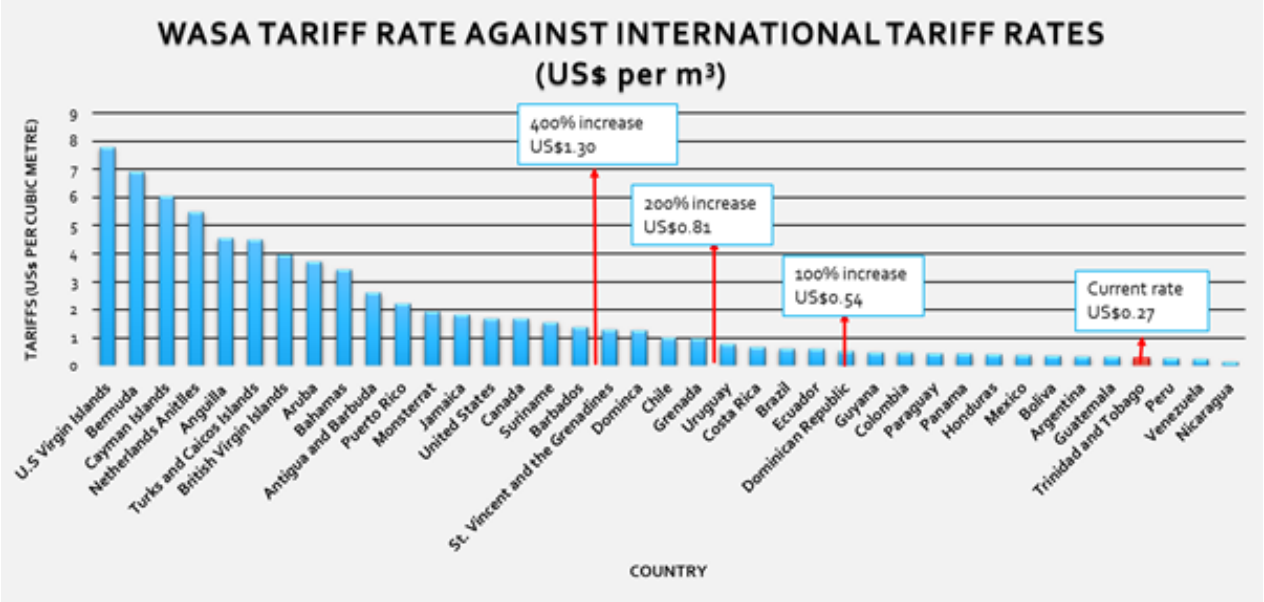
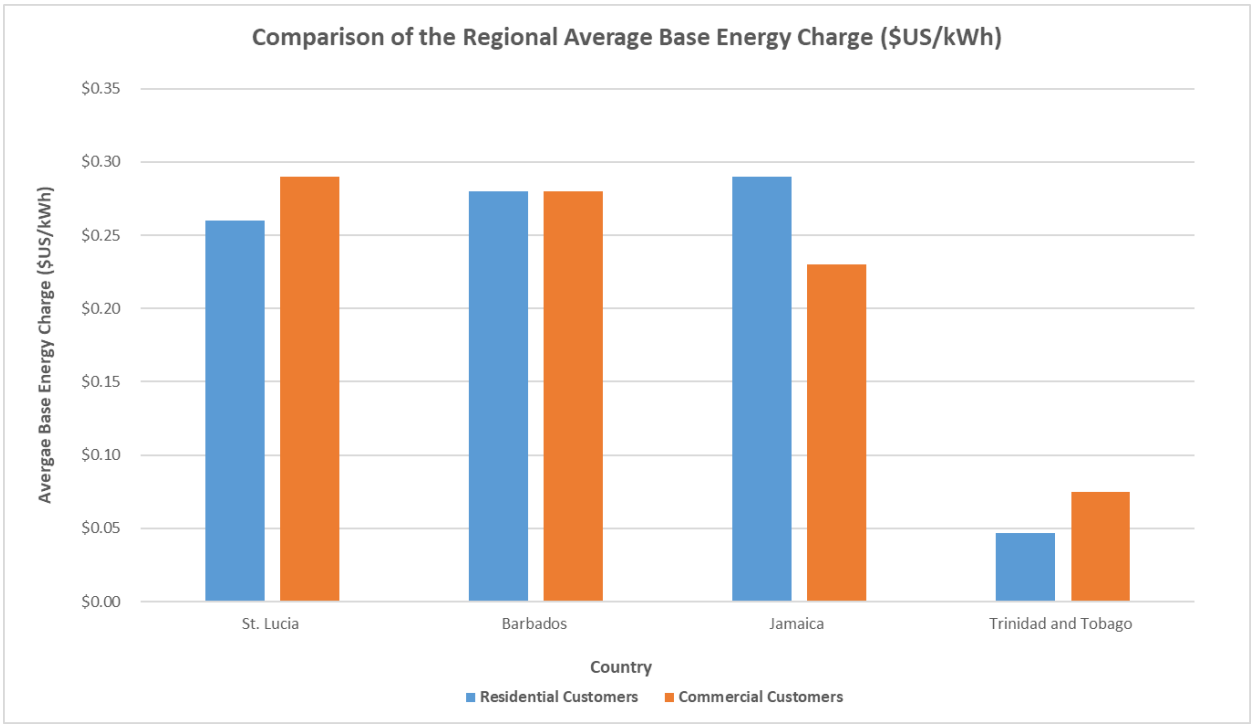


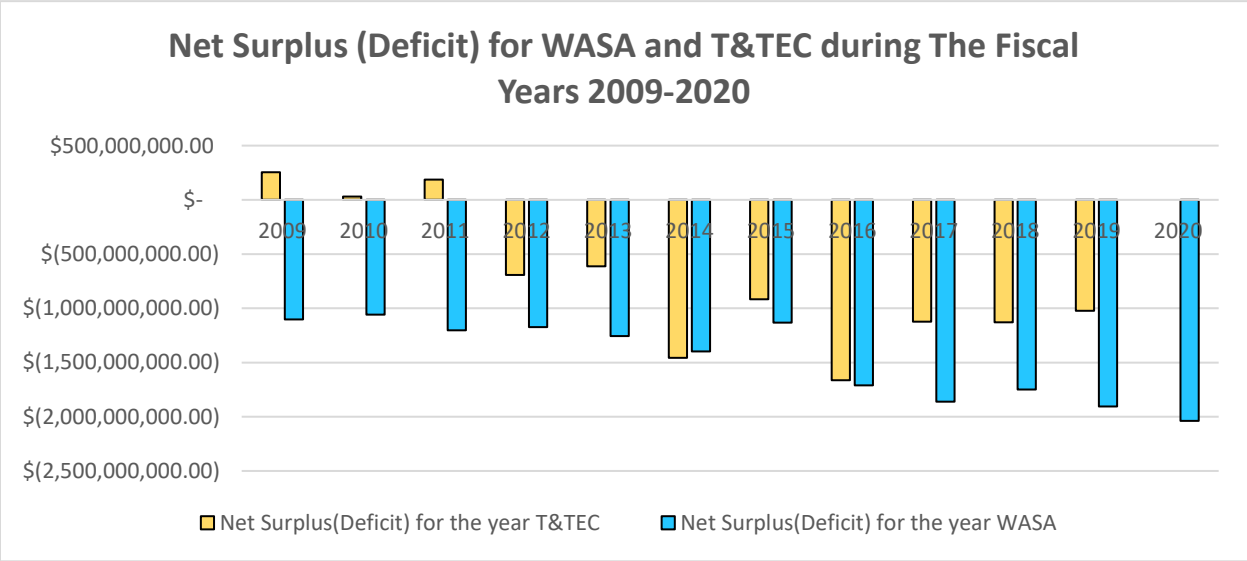
Chart 2



The unrealistically low rates have had a significant negative impact on the Utilities' financial positions as their revenues are unable to cover their costs, contributing to chronic deficits. In this

regard, T&TEC's financial position moved from surplus of $203M in 2007 to deficit from 2012 at the end of the price control period, peaking at $1.7B in 2016. It should be noted that a contributory factor to the weakening of T&TEC's financial position is the additional expense incurred for the payment of the excess generation capacity from Trinidad Generation Unlimited under the take or pay arrangement. In the absence of a rate review, T&TEC's deficit is projected to average $1billion annually. WASA's financial performance has been no different, with deficits of over $1.0B being recorded in each year over the period 2009 to 2019, peaking at $1.9B in 2019. (**See Chart 3**).

Chart 3



The inability of T&TEC and WASA to cover their costs from revenues has resulted in unfunded mandates which remain unfulfilled, particularly with respect to improvements in service quality. It has also led to the deferment of maintenance, repair and upgrade works; and failure to invest at the rate needed to replace existing capital assets. This under investment in asset maintenance and capital improvements has severely compromised the operational efficiency of these utilities.

Another unintended consequence of the low utility rates, is the grant of an across-the-board subsidy to all consumers irrespective of their income levels, including the wealthy who can afford to pay the true economic cost for these services. Further, it has also encouraged high consumption and wasteful practices at the expense of conservation.

Financing these deficits has occurred through production subsidies, which in the case of WASA represents Government's subvention of approximately $2.0B annually. This is in addition to Government's financing of the purchase of desalinated water from Desalcott. T&TEC, on the other hand, whilst not in receipt of a subvention from the Government, has not been making payments to NGC for natural gas purchased, which averages about $1.0B annually escalating by 3%. The amount outstanding to the NGC for fuel consumed for 2019 to October 2020 is $1.783B. It should be emphasized that the gas is supplied at a highly subsidized price, which is the main driver for the low price of electricity.

The Way Forward

The Sub-Committee notes that given the country's economic realities, which have been negatively impacted by the COVID-19 Pandemic, the existing across-the-board subsidization of electricity, water and wastewater services resulting from uneconomic rates are not sustainable; and there is an urgent need to implement more realistic utility rates. The Sub-Committee also notes that the upward adjustment of these rates is an extremely sensitive issue and can be expected to elicit strong reactions among the population, given the acknowledged deficiencies in the quality of service provided by these utilities, especially WASA. In this regard, the Sub-Committee wishes to underscore the importance of the need for the Utilities to maintain a reasonable quality of service going forward. The delivery of a level of service in keeping with the QSS are pivotal in this regard. It is also important that the rate review process be carefully managed.

Recommendations:

1. Priority should be given to the finalization and approval by Cabinet of the Business Plans for both WASA and T&TEC for the control period 2018-2023, which are on the critical path of the rate review exercise being undertaken by the RIC. It is recommended that:
   (a) T&TEC's Business Plan, which is currently before the Energy Sub-Committee of Cabinet, be placed on the Committee's Agenda for early consideration; and
   (b) WASA's Business Plan be reviewed by the new Board of Commissioners of WASA as an urgent priority, following which a decision will be made on the way forward. It is more than likely, that the Plan may have to be revised to take account of the outcomes of the Sub-Committee's Report.

2. The Ministry of Public Utilities to fast-track the submission of the Quality of Service Standards for T&TEC and WASA to Cabinet for gazetting

3. WASA to expedite the preparation and submission to the RIC of relevant Action Plans providing timelines for implementing the standards where moratoria were granted.

4. In order to protect the vulnerable, direct subsidies should be provided to targeted T&TEC and WASA consumers to cushion the impact of the proposed rate increase. In this regard, an Inter-Ministerial Technical Team, chaired by the Ministry of Social Development and Family Services and including representatives of the Ministry of Finance and the Ministry of Public Utilities should be appointed to:
   (a) review the existing Public Utilities Bill Assistance Programme of the Ministry of Public Utilities to determine, inter alia, its effectiveness, fulfilment of objectives and efficiency; and
   (b) examine the impact of the proposed increased rates on the vulnerable population and make appropriate recommendations for their protection.

5. The Ministry of Public Utilities to ensure that remittance of subsidy payments to T&TEC and WASA under the existing Public Utilities Bill Assistance Programme be made in a timely manner so as to avoid any negative impact on the revenue streams and cash flow position of these Utilities. In this regard, there is need for timely releases of funds by the Ministry of Finance.

6. An effective communication strategy, coordinated by the Office of the Prime Minister, be developed and implemented to win public support for the expected adjustment in rates. The underlying message should focus on changing consumption patterns of water and electricity use to promote conservation and energy efficiency, the benefits to consumers from the improvements in the quality of service that are driving the rates, and the consequences to the utilities, particularly in terms of the negative impact on their operational efficiency if the rates are not implemented.

7. The Ministry of Public Utilities to monitor and report to Cabinet on the status of the price review exercise.

Annex 1
Comparison Table of RIC's Quality of Service Standards for WASA vs. International and Regional Standards

RIC Guaranteed Water Standards (GWS) and Overall Water Standards (OWS) - TRINIDAD AND TOBAGO				**Office of Water Services (OFWAT) Guaranteed Standard- UNITED KINGDOM**	**Office of Utilities Regulation (OUR) Guaranteed and Overall Water Standards - JAMAICA**	**Observations**
Code	**Standard Description**	**Performance measure**	**Moratorium**	**Performance measure**	**Performance measure**	
GWS 1	Implementation of Water Schedules	WASA is required to provide a minimum supply of 48 hours aggregate per week at 5 psi (minimum), **except in areas where a moratorium has been granted.**	*WASA will be granted a 24-months moratorium for areas where the service provider cannot meet the standard. WASA is required to provide a minimum supply of 24 hours per week for areas under a moratorium. WASA is required to identify the areas where it cannot meet the standard and submit an action plan detailing steps to bring these areas up to the standard within the moratorium period.*	No standard	No standard	The scheduled water minimum pressure (5psi) is significantly lower than the non-scheduled water pressure (20psi) to water service connections. (See OWS2)
GWS 2	Restoration of Supply after a service interruption	**For Planned Interruptions:** WASA is required to restore supply as per published times, but no later than 48 hours after the start of the interruption **For Unplanned Interruptions:** WASA to restore supply to customers within: • 72 hrs for trunk mains • 48 hrs for strategic mains • 24 hrs other interruptions			No standard	The restoration schedule are less stringent.

Annex 1
Comparison Table of RIC's Quality of Service Standards for WASA vs. International and Regional Standards

GWS 3	Provision of Truck borne supply if the main supply is interrupted	**For Planned interruptions:** WASA is required to provide a maximum of 400 gallons per class A customers' requests, and a maximum of 1200 gallons per classes B, C, D and E customers' request, within 48 hours after the notified time for interruption has ended if pipe-borne supply is not yet available. **For Unplanned interruptions:** WASA is required to provide a maximum of 400 gallons per class A customers' requests, and a maximum of 1200 gallons per classes B, C, D and E customers' request, from 48 hours after the start of the disruption and within the next 48 hours if pipe-borne supply is not yet available		No standard	No standard	Noted that a customer can possibly not have a water supply for a total of 4-5 days if coupled with schedule in GWS 2.
GWS 4	Time to repair to Water Service connections (WSC)	WASA is required to repair a water service connection (WSC): 1. Within 48 hrs (2 working days) of a report by the customer – for loss of supply to registered critical institutions (e.g. schools, hospitals) and leaks resulting in damage to property.	*WASA requested that the utility be allowed five (5) working days to repair leaks affecting supply to customers instead of three (3) working days owing to the backlog of outstanding leak repairs.*	No standard	No standard	RIC standards are less stringent

		2. Within 5 working days – for leaks & loss of supply affecting supply to the customer.				
GWS 5	Installation of new Water Service Connections (WSC)	WASA is required to complete the various stages for installation of a new water service connection within the specified time as follows: **For (¾") WSC (Domestic) and 1"-4" (Multiple family dwelling units)** 1. Determine the feasibility and notify customers within 10 working days of application 2. Install WSC within 15 working days following payment of applicable rates. **For 1" and above - ALL other WSC** 1. Issue response to an application for Outline Approval within 20 working days of receipt of payment. 2. Issue Design Approval within 20 working days of receipt of acceptable engineering design. 3. Issue Final Approval within 20 working days of receipt of an inspection report	*WASA indicated that there is a backlog in the request for new service connections, and requested a moratorium to improve the system and clear off the backlog.* *WASA will be granted a moratorium for 12 months. WASA to submit an action plan detailing steps that will be taken and timelines to enable implementation of the standard*	No standard	Minimum time to connect new customer – 10 working days	Connection time exceeds regional standard

Annex 1
Comparison Table of RIC's Quality of Service Standards for WASA vs. International and Regional Standards

		4. Conduct pressure testing works within 10 working days 5. Generate Meter Accounts within 18 working days 6. Payment received and Completion Certificate issued within 10 working days. 7. Complete interconnection with 12 working days.				
GWS 6	Reconnection of supply after settling outstanding accounts or disconnection due to error	WASA is required to reconnect the water supply to a customer: • Within 1 working day of receipt of full payment and reconnection fee, or as per agreement with WASA for installations with a curb valve or in determining of an error made • Within 2 working days for all other installations		No standard	Maximum time to restore supply after payment is made – 24 hours	Comparable with regional standards
GWS 7	Response to complaints	WASA is required to respond to complaints as follows: 1. Acknowledge complaint within 5 working days of receipt of the complaint 2. Provide a substantive response within 30 working days of receipt of the complaint		Maximum time to reply to a complaint from receipt of letter - within 10 working days	Time to acknowledge inquiry after receipt- 5 working days Maximum time to complete investigation and respond from the date of receipt on inquiry- 30 working days	Standards are within international and regional standards

Annex 1
Comparison Table of RIC's Quality of Service Standards for WASA vs. International and Regional Standards

GWS 8	Response to Poor Water Quality	WASA is required to: 1. Respond, and conduct site visit where necessary, within 1 working day of being notified 2. Solve the problem within 3 working days of the site visit 3. Provide an alternative water supply where applicable		No standard	No standard	RIC standards for treating with poor water quality and responding to complaints are stringent
GWS 9	Compensatory payments for guaranteed standards	WASA is required to make a compensatory payment to the customer within 60 working days of receipt of a claim		No standard	Maximum time to make compensation payment when it becomes due- 30 days	The regional standard is more stringent.
OWS 1	Notification with respect to planned supply interruptions	WASA is required to notify customers that will be affected by a planned supply interruption at least 48 hours prior to the interruption if it is expected to last for more than 4 hours		**Planned:** Minimum notification time to inform customers of interruption- 48 hours **Unplanned:** 12 to 48 hours	Minimum notification time of 24 hours for extended lock-offs (more than 4 hours) and 12 hours for shorter lock-offs (not more than 4 hours) for planned work.	RIC standard does not make provision for unplanned interruptions as per international standards.
OWS 2	Water Pressure	The water pressure provided by WASA at the Water Service Connection (WSC) point to customers (who are not on a schedule) must be: • Minimum 14m head of pressure (20 psi)	*WASA will be granted a moratorium for 24 months to allow WASA to acquire and install the requisite data loggers and other equipment to monitor pressure within the distribution network. WASA to submit an action plan detailing steps that will be taken and timelines to enable*	Minimum water pressure of >7m Head (3.03 psi) to be maintained.	Maintain a pressure ranging from 20 psi (minimum) to 60 psi (maximum)	The minimum and maximum range exceed international and regional standards.

Annex 1
Comparison Table of RIC's Quality of Service Standards for WASA vs. International and Regional Standards

		• Maximum 70m head of pressure (100 psi)	*implementation of the standard. WASA will submit progress reports during the moratorium and the RIC will monitor the implementation progress of the action plan.*			
OWS 3	Metering	WASA is required to: 1. Read meter at least every 2 billing cycles for all categories of customers 2. Issue bills within 10 working days of meter reading 3. Repair defective water meters within 30 days of receipt of a report			Maximum time to install meter after receiving a customer's order - 30 working days Maximum time to repair or replace meter after being informed -20 working days NWC must provide written details of the date of the change to meter, meter readings on the day and serial number of the new meter Maximum time between the issue of bills -3 months	RIC standard for the repair of meters is less stringent

Annex 1
Comparison Table of RIC's Quality of Service Standards for WASA vs. International and Regional Standards

OWS 4	Drinking water quality	WASA is required to: 1. Sample drinking water supply according to an established schedule 2. Ensure 100% compliance with WHO guidelines for bacteriological thresholds (water) 3. Ensure at least 95% compliance with WHO guidelines for physical/chemical parameters (water)		No Standard	Testing of water samples. Ensure water is within standards as specified by MOH	RIC Standards for compliance is more stringent
OWS 5	Sewage effluent quality	WASA is required to be in compliance with the effluent discharge standard of water pollution rules or equivalent standard as set by the relevant authority having such jurisdiction		No Standard	No Standard	RIC Standards are less stringent.
OWS 6	Repair to sewers	WASA is required to: 1. Clear choke in WASA sewer system within 18 hours of receipt of a report of overflow. 2. Repair collapse of WASA sewer system within 72 hours of receipt of a report		Compensation due if flooding occurs	No Standard	RIC Standards do no give consideration for compensation to customers affected by overflow.
OWS 7	Road restoration after pipeline works	After completion of pipeline works, WASA is required to carry out temporary restoration of roads within 24 hours and permanent restoration within 7 working days, in accordance with the road restoration guidelines	*WASA will be granted a moratorium for 24 months to reduce the backlog of road restoration works and improve the ability of the utility to meet the standard. WASA to submit an action plan for bringing performance up to the standard, and to report*	No standard	No standard	RIC standards for restoring roads are stringent

Annex 1
Comparison Table of RIC's Quality of Service Standards for WASA vs. International and Regional Standards

		issued by the Ministry of Works or equivalent entity.	*performance data during the moratorium.*			
OWS 8	Claims for damage	WASA is required to: 1. Reply within 5 working days of receipt of a claim 2. Complete investigation within 30 working days of receipt of a claim 3. Determine liability and make a payment, where applicable, within 60 working days of receipt of the claim and required information		No standard	No standard	RIC standards are
OWS 9	Making and Keeping appointments	WASA personnel is required to: 1. Arrive within 60 minutes of the scheduled time of appointment 2. Notified customer no less than 1 working day before appointment of inability to keep it	*WASA indicated that there is no system in place for managing and tracking appointments. WASA will be granted a moratorium for 12 months to allow WASA the time to acquire the requisite equipment to implement the standard. WASA is required to submit an action plan detailing the steps that it will take to implement the standard.*	Must offer to keep at least a morning or afternoon appointment with a customer – 24 hours' notice to be given if rescheduling is necessary	Must offer to keep at least a morning or afternoon appointment with a customer – Reasonable time for notice must be given if rescheduling is necessary	Standards are within international and regional standards

Additional Observations:

- Both International (OFWAT) and Regional (OUR) Standards have standards geared towards responding to account queries and RIC does not.
- RIC QSS appears to be reactive as the standards are commensurate with the problems that are faced by the sector.

ANNEX 2

Guaranteed Standards

Code	Service Description	Performance Measure	Required Performance Units	Payments per Customers *
GES1	Restoration of supply after unplanned outage on the distribution system.	Time for restoration of supply to affected customers	Within 10 hours	$60 (residential) $600 (non-residential) For each further 12 hr period $60 (residential) $600 (non-residential)
GES2	Billing Punctuality .Time for first bill to be mailed after service connection.	Time for first bill to be mailed after service connection: (a) Residential (b) Non-Residential	 60 days 30 days	$50 for both residential and non-residential
GES3	Reconnection of service after payment of overdue amounts or agreement on payment schedule	Time to restore supply after payment is made (All customers)	Within 24 hours	Refund of reconnection fee for both residential and non-residential
GES4	Making and keeping appointments	Where required, appointments will be	24 hours notice of inability to keep an	$50 for both residential and non-residential

Code	Service Description	Performance Measure	Required Performance Units	Payments per Customers *
		made on a morning or afternoon basis	appointment with customers.	
GES5	Investigation of Voltage Complaints	Time to visit, correct problem and notify affected customers	Within 24 hours, Correct within 15 working days.	$50 (residential) $600 (non-residential)
GES6	Responding to billing and payment queries	Provide a substantive reply	Within 15 working days	$50 for both residential and non-residential
GES7	New Connection of supply	Service drop and meter to be installed	Within 3 working days	$50 for both residential and non-residential
GES8	Payments owed under guaranteed standards	Time to credit compensatory payment.	Within 30 working days for non-residential and 60 days for residential.	$50 for both residential and non-residential

ANNEX 2

Overall Standards

Code	Description	Required Performance Units
OES1	Frequency of meter reading	a. 90% of industrial meters should be read every month b. 90% of residential and commercial meters read according to schedule
OES2	Billing punctuality	98% of all bills to be mailed within ten (10) working days after meter reading or estimation
OES3	Responding to meter problems	Visit or substantive reply within 10 working days 95% of the time
OES4	Prior Notice of planned outages	At least 3 days advance notice of planned outages 100% of the time
OES5	Street lights maintenance.	100% of failed street lights with the exception of highway lighting repaired within 7 working days. 100% of failed highway lighting repaired within 14 working days.
OES6	Response to customer queries/requests (written)	Substantive response within 10 working days and communicating final position within 30 working days.
OES7	Notifying customers of receipt of claim under guaranteed standard GES1.	100% of customers to be notified of receipt of claim within 10 working days.