Office of Utilities Regulation

Richmond Environmental Services Limited Interim Water and Sewerage Rates

Determination Notice

OFFICE OF UTILITIES REGULATION

2020 April 03

DOCUMENT TITLE AND APPROVAL PAGE

1. **DOCUMENT NUMBER: 2020/WAS/002/DET.002**
2. **DOCUMENT TITLE: Richmond Environmental Services Limited Interim Water and Sewerage Rates Determination Notice**

3. PURPOSE OF DOCUMENT

This document examines Richmond Environmental Services Limited's Water and Sewerage Rates proposal and sets out the Office's decision on the rates to be charged for water and sewerage services by the company.

4. ANTECEDENT PUBLICATIONS

Publication Number	Publication Title	Publication Date

5. Approval

This document is approved by the Office of Utilities Regulation and the decisions therein become effective on **2020 April 03**

On behalf of the Office:

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Ansord E. Hewitt
Director-General

2020 April 03

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1. Executive Summary

1.1. Richmond Environmental Services Limited (RESL) is a limited liability company with registered office in Montego Bay, St. James. It is the holder of two separate licences for the supply of water and sewerage services. Both licences were issued on 2013 December 30. The licences allow RESL to provide these services to residents of Richmond Estates in Llandovery, St. Ann.

1.2. By way of letter dated 2019 October 31, RESL requested approval from the Office of Utilities Regulation (OUR) for the water and sewerage rates it was currently charging its customers. This request came in response to the OUR's letter dated 2019 September 17, indicating to the company that it should submit an application for approval of rates since none was sought, since it was granted its water and sewerage licences.

1.3. Accordingly, RESL submitted a rate application. Table 1.1 below shows the proposed water and sewerage rates submitted for approval.

Table 1.1 - RESL's Proposed Rates

Rates per 1000 litres		
Consumption (litres)	**Water**	**Sewerage**
0 to 20,000	$50.00	$25.00
above 20,000	$87.15	$43.58

1.4. In assessing the reasonableness of RESL's Application, the OUR was guided by the rate-making principles outlined in the company's Licences and the OUR's "No Objection Policy". The OUR has, over the years, applied the 'No Objection Policy' to the approval of rates for private water and sewerage service companies. The 'No Objection Policy' is based on a principle that if the rates proposed by a private water or the sewerage services provider are below those being charged by the NWC for comparable services, the Office would not object to the implementation of the proposed rates.

1.5. Given the need to urgently regularise RESL's existing rates, and the fact that the requisite cost data on the company's operations would not be readily available to perform a comprehensive, cost-based analysis, the OUR considered it prudent to apply the "No Objection Policy", but predicated on a benchmarking technique to establish an interim rate for RESL.

1.6. The rates submitted by RESL were benchmarked against six (6) water and sewerage companies in our jurisdiction. The companies are: the National Water Commission (NWC), which is the dominant service provider, Dynamic Environmental Management Limited (DEML), Can Cara Development Limited (CDL), Runaway Bay Water Company (RBWC), Tryall Golf & Beach Club Limited (TGBC) and Landmark Developers Limited (LDL).

1.7. The benchmarking analysis revealed that the proposed water and sewerage rates for RESL were the lowest amongst all the other providers in the benchmark study for both water and sewerage services. For a typical customer whose consumption is 21,000 litres/month, RESL

rates were 69% and 84% lower than the comparable NWC water and sewerage rates respectively. Tables 1.2 and 1.3 below give further details of the benchmarking analysis.

Table 1.2: Benchmark Analysis for Water Service

Water						
	Bill Amounts for 21, 000 Litres (J$)					
Consumption ('000 Litres)	NWC	TGBC	RBWC	CDL	DEML	RESL
14	1,451.10	2,016.00	1,176.00	1,297.38	1,642.34	$700.00
6	1,096.80	864.00	888.66	980.46	703.86	$300.00
1	182.80	144.00	148.11	163.41	117.31	$87.15
Service Charge	830.00	-	670.23	739.28	666.82	-
Total Charge (J$/month)	**3,560.70**	**3,024.00**	**2,883.00**	**3,180.53**	**3,130.33**	**1,087.15**
RESL relative to other providers	**-69%**	**-64%**	**-62%**	**-66%**	**-65%**	**-**

Table 1.3: Benchmark Analysis for Sewerage Services

Sewerage						
	Bill Amounts for 21, 000 Litres (J$)					
Consumption ('000 Litres)	NWC	Landmark	RBWC	CDL	DEML	RESL
14	1,317.26	1,177.54	1,076.46	1,177.54	1,642.34	350.00
6	995.40	889.80	813.36	889.80	703.86	150.00
1	165.90	148.30	135.56	148.30	117.31	43.58
Service Charge	830.00	739.28	670.23	739.28	666.82	-
Total Charge (J$/month)	**3,308.56**	**2,954.92**	**2,695.61**	**2,954.92**	**3,130.33**	**543.58**
RESL relative to other providers	**-84%**	**-82%**	**-80%**	**-82%**	**-83%**	**-**

1.8. In light of the above analyses, and given that RESL's proposed rates result in a significantly lower tariff than those on offer by the NWC and the other benchmarked companies, the OUR has no objection to RESL charging the proposed rates. Accordingly, the Office approves the rates stated below:

	Water	**Sewerage**
Service Charge	Nil	Nil
0 to 20,000 litres	$50.00/"000"litres/month	$25.00/"000"litres/month
Over 20,000 litres	$87.15/"000"litres/month	$43.58/"000"litres/month

1.9. The rates above shall remain in effect for a period of at least twenty-four (24) months, effective from the date of this Determination Notice.

1.10. RESL shall prepare and submit an application for a comprehensive review of rates based on its actual cost of providing the service within twenty-one (21) months of the effective date of this Determination Notice. The application shall include, among other things, the most

recent available audited financial statements, water production and sales data and water quality reports.

1.11. During the interim period, RESL shall meet at a minimum, the service and guaranteed service standards as set out in Schedule 2 of the Licences. The compensation mechanism for a breach of a Guaranteed Standard shall be established at the next review of rates.

2. Definitions, Acronyms and Abbreviations

CDL	-	Can-Cara Development Limited
DEML	-	Dynamic Environmental Management Limited
EE	-	Energy efficiency
Government	-	Government of Jamaica
GS	-	Guaranteed Standards – Quality of Service
Landmark or LDL	-	Landmark Development Limited
Licences	-	Richmond Environmental Services Limited Water Supply Licence, 2013 and Richmond Environmental Services Limited Sewerage Service Licence, 2013
Licensed Business	-	The supply of water and the provision of sewerage services by the Licensee as authorized pursuant to the Licences
Licensee/RESL	-	Richmond Environmental Services Limited
Minister	-	Minister of Government with portfolio responsibility for water
MTAOP	-	"Meter Testing Administrative and Operational Protocol for the Electricity and Water Sectors in Jamaica, 2017" Document No. 2016/GEN/004/RUL.001
NEPA	-	National Environment and Planning Agency
NRCA	-	Natural Resources Conservation Authority
NRW	-	Non-Revenue Water
NWC	-	National Water Commission
OUR Act	-	The Office of Utilities Regulation Act
OUR/Office	-	Office of Utilities Regulation
RBWC	-	Runaway Bay Water Company Limited
Sewerage Licence	-	Richmond Environmental Services Limited Sewerage Service Licence, 2013
TGBC	-	Tryall Gulf & Beach Club Limited

Water Supply Licence	-	Richmond Environmental Services Limited Water Supply Licence, 2013
WRA	-	Water Resources Authority

3. Introduction

3.1. Richmond Environmental Services Limited (RESL) is a private water and sewerage company that provides both water and sewerage services to the residents of Richmond Estates in Llandovery, St. Ann. RESL is the holder of two licences granted by the Minister on 2013 December 30 - the **Richmond Environmental Services Limited Sewerage Services Provider Licence, 2013** and the **Richmond Environmental Services Limited Water Supply Licence, 2013.**

3.2. RESL's registered office is situated at Shop G5 Praise Concourse Plaza, 18 Queen's Drive, Montego Bay, St. James. The company is a subsidiary of the Richmond Development Company Limited. RESL currently serves 816 residential customers on the Richmond Estates property, which is 48,405 m^2 in size. RESL indicated an intention to connect more houses to its water and sewerage services once the housing construction is completed.

3.3. RESL holds a Water Abstraction Licence dated 2018 February 26 from the Water Resource Authority (WRA), which allows the company to abstract no more than 3,500 cubic metres of water per day from the Richmond #2 Well located at Richmond, St. Ann. The licence to abstract and use water is valid for a period of five (5) years.

3.4. This Determination Notice outlines RESL's Application and sets out the OUR's analyses and determinations.

4. Legal Framework

4.1. The OUR is a multi-sector utility regulator established pursuant to the Office of Utilities Regulation Act (OUR Act), with regulatory oversight of the provision of prescribed utility services in Jamaica. The supply and distribution of water and provision of sewerage services are included among the prescribed utility services defined in section 2 and the First Schedule of the OUR Act.

4.2. Sections 4 (4) of the OUR Act expressly authorises the Office to determine the rates charged for the provision of a prescribed utility service. The section reads:

> *"(4) The Office shall have power to determine, in accordance with the provisions of this Act, the rates or fares which may be charged in respect of the provisions of a prescribed utility service."*

4.3. On 2013 December 30, pursuant the OUR Act, the minister with portfolio responsibility for the water and sewerage sectors granted two (2) licences to RESL to provide sewerage services and to supply and distribute potable water to the specified service area of Richmond Estates, in Richmond, St. Ann. The provisions of the Licences reinforce the OUR's statutory powers to regulate the Licensed Business.

4.4. With respect to price controls, Clause 6.17 paragraphs 1 and 2 of the Licences provide that:

> *"1. "The Licensee" is subject to the conditions in Schedule 3.*
>
> *2. The rates to be charged by "the Licensee" in respect of the prescribed utility services shall be subject to such limitation as may be imposed from time to time by "the Office.""*

4.5. The Licences stipulate that the rates and charges as determined by the OUR should provide a reasonable opportunity for the Licensee to make a reasonable return on capital employed after taking into account all reasonable costs incurred in the provision of services. Extracts from Schedule 3 of the Licences provide for:

> *"The rates for the supply of services by the "Licensed Business" shall be set such that the rates provide a reasonable opportunity for "the Licensee" to make a reasonable return on capital employed after taking in account all reasonable costs incurred in the provision of the services.*
>
> *Revenue Requirement = operating costs + depreciation + taxes + return on investment, with each component defined as follows:*
>
> *"Operating costs": All prudently incurred costs, which are not directly associated with investment in capital plant…*
>
> *Return on Investment…The return on investment shall be calculated by multiplying the allowed rate-of-return by "the Licensee's" total investment base ("Rate Base") for the test year. The allowed rate of return is "the Licensee's" Weighted Average Cost of Capital (WACC). The WACC ("K %") will balance the interests of both consumers and investors and be commensurate with returns in other enterprises having corresponding risks*

which will assure confidence in the financial integrity of the enterprise so as to maintain its credit and to attract capital…"

4.6. With regard to the application for an initial tariff, Schedule 3 of the Licences provides that:

"On *the granting of this Licence, "the Licensee" shall submit a proposal for the initial tariffs to be charged in respect of services and the Rate Review Process as set out herein under shall be applicable."*

4.7. Further, the Licensee is permitted to apply to the OUR for a tariff review as needed, but no more frequently than once in every two (2) years. Schedule 3 of the Licence provides that:

"*At such intervals as the Licensee may determine but no more often than once in every two (2) years, the Licensee may submit an application for a tariff review. The Application must be supported with data and information as the Office will determine."*

4.8. In addition to the provisions made under Schedule 3 of the Licences to guide the rate review process, the OUR currently has a "No Objection Policy" that is applicable to private water and sewerage service providers, such as RESL. The rule states that if rates proposed by a private water and sewerage provider are below those being charged by the National Water Commission (NWC) for comparable services, the Office would "not object" to the implementation of such rates. Where the proposed rates are higher than those of the NWC, the private provider is required to provide the necessary cost data and audited financial statements in support of its application to facilitate a comprehensive rate review in order to set rates that are reflective of the cost to provide the service.

4.9. The Licences expressly states in Schedule 2 that the Licensee shall observe prescribed service standards and it also authorizes the OUR to introduce new or vary existing service and guaranteed standards that will encourage and facilitate minimum standards of supply and customer service.

5. Summary of the Tariff Proposal

5.1. In light of RESL's failure to submit an application for water and sewerage rates after it was granted the Licences in 2013 December, the OUR by letter dated 2019 September 17 requested the company to make a rate submission.

5.2. The utility company, which was for some time operating commercially, applied for a rate review by way of a letter dated 2019 October 31 and received by the OUR on 2019 November 04.

5.3. In the application, RESL requested a two-tiered volumetric charge for both its water supply and sewerage services and no fixed service charge. The proposed rates are as shown in Table 5.1 below.

Table 5.1 RESL Proposed Water and Sewerage Rates

Rates per 1000 litres		
Consumption (litres)	**Water**	**Sewerage**
0 to 20,000	$50.00	$25.00
above 20,000	$87.15	$43.58

6. Evaluation of Application

6.1. The OUR evaluated the reasonableness of rates proposed and was guided by the rate-making principles outlined in the Licence as well as its "No Objection Policy", which it has applied in a number of private water and sewerage rate reviews.

6.2. In light of the need to quickly regularise the water and sewerage rates for RESL, and the absence of requisite cost data on the company's operations to conduct a comprehensive, cost-based analysis, the OUR considered it prudent to use its "No Objection Policy" to establish an interim rate for RESL.

6.3. The "No Objection Policy" approach is usually applied when adequate and reliable costing and operation data are unavailable for the private provider seeking a rate review. In this context, the regulator is without an objective means of determining rates based on the company's actual performance. Consequently, a second best option is to set rates using a benchmarking approach, which involves an analysis of the approved rates of other licenced providers in the water and sewerage industry, including the dominant provider, NWC. Should the rates requested by the utility be less than those of NWC, the Office issues a "No Objection" decision approving the requested rate. If however, the requested rate exceeds the referenced NWC rates, then the Office would approve rates consistent with a comparable firm in the benchmarking analysis.

6.4. The benchmark analysis conducted involved a comparison of RESL's rates against those now being offered by the NWC, which is the dominant provider, Dynamic Environmental Management Limited (DEML), Can Cara Development Limited (CDL), Runaway Bay Water Company (RBWC), Tryall Golf & Beach Club Limited (TGBC) and Landmark Developers Limited (LDL). The companies were chosen based on the comparable services provided (water and sewerage) to residential customers.

6.5. Tables 6.1 and 6.2 below show the current rates being charged by the companies in the benchmark analysis for water and sewerage services respectively. The proposed rates for RESL are also included in the tables.

Table 6.1: Benchmark Analysis for Water Rates

Residential Water Rates per 1000 litres						
Consumption (Litres)	**NWC**	**TGBC**	**RBWC**	**CDL**	**DEML**	**RESL**
First 14,000	$103.65	$144.00	$84.00	$92.67	$117.31	$50.00
Next 6,000	$182.80	$144.00	$148.11	$163.41	$117.31	$50.00
Next 7,000	$182.80	$144.00	$148.11	$163.41	$117.31	$87.15

Table 6.2: Benchmark Analysis for Sewerage Rates

Residential Sewerage Rates per 1000 litres						
Consumption (Litres)	**NWC**	**Landmark**	**RWBC**	**CDL**	**DEML**	**RESL**
First 14,000	$94.09	$84.11	$76.89	$84.11	$117.31	$25.00
Next 6,000	$165.90	$148.30	$135.56	$148.30	$117.31	$25.00
Next 7,000	$165.90	$148.30	$135.56	$148.30	$117.31	$43.58

6.6. A typical customer with consumption of 21,000 litres was used in the analysis and bill computation. Table 6.3 and Table 6.4 below show the comparisons of the bill amounts for water and sewerage, respectively. For water services, the analysis showed that RESL's rates would result in a total bill amount that would be 69% lower than that of the NWC rates charged at the time of submission of the application. For sewerage services, RESL's customer would enjoy a bill total that is 84% lower than a comparable NWC customer. The typical RESL water customer would see a 65% lower rate than the average of the rates being charged by the other water providers, and its sewerage customer rate would be 82% lower than the average of the rates being charged by the other sewerage providers in the benchmark study.

Table 6.3: Benchmark Analysis - Bill Comparison for Water

Water						
	Bill Amounts for 21, 000 Litres					
Consumption ('000 Litres)	**NWC**	**TGBC**	**RBWC**	**CDL**	**DEML**	**RESL**
0 -14	$1,451.10	$2,016.00	$1,176.00	$1,297.38	$1,642.34	$700.00
>14 -20	$1,096.80	$864.00	$888.66	$980.46	$703.86	$300.00
>20	$182.80	$144.00	$148.11	$163.41	$117.31	$87.15
Service Charge	$830.00	-	$670.23	$739.28	$666.82	-
Total Charge (J$/month)	**$3,560.70**	**$3,024.00**	**$2,883.00**	**$3,180.53**	**$3,130.33**	**$1,087.15**
RESL relative to other providers	**-69%**	**-64%**	**-62%**	**-66%**	**-65%**	**-**

Table 6.4: Benchmark Analysis - Bill Comparison for Sewerage Services

Sewerage						
	Bill Amounts for 21, 000 Litres					
Consumption ('000 Litres)	**NWC**	**Landmark**	**RBWC**	**CDL**	**DEML**	**RESL**
0 -14	$1,317.26	$1,177.54	$1,076.46	$1,177.54	$1,642.34	$350.00
>14 -20	$995.40	$889.80	$813.36	$889.80	$703.86	$150.00
>20	$165.90	$148.30	$135.56	$148.30	$117.31	$43.58
Service Charge	$830.00	$739.28	$670.23	$739.28	$666.82	-
Total Charge (J$/month)	**$3,308.56**	**$2,954.92**	**$2,695.61**	**$2,954.92**	**$3,130.33**	**$543.58**
RESL relative to other providers	**-84%**	**-82%**	**-80%**	**-82%**	**-83%**	-

6.7. In keeping with its No Objection Policy, and given that RESL's proposed rates result in a significantly lower tariff than those on offer by the NWC at the time of the filing, the OUR has no objection to RESL applying the proposed rates as shown below.

	Water	**Sewerage**
Service Charge	Nil	Nil
0 to 20,000 litres	$50.00/"000"litres/month	$25.00/"000"litres/month
Over 20,000 litres	$87.15/"000"litres/month	$43.58/"000"litres/month

6.8. These rates shall remain in effect for a period of two (2) years from the effective date of this decision. During the intervening period, RESL shall prepare and submit an application for a comprehensive review of rates based on its actual cost of providing the services.

6.9. The application shall be submitted within twenty-one (21) months of the effective date of this Determination Notice. The application shall include, among other things, the most recent available set of audited financial accounts, water production and sales data and water quality reports.

6.10. In the interim RESL shall meet at a minimum the service standards as set out in Schedule 2 of the Licences and the guaranteed standards set out in Schedule 2 of the Water Supply Licence. The compensation mechanism for a breach of a Guaranteed Standard will be established at the next review of rates.

Determination 1

a) The Office has approved the following interim tariffs for RESL:

	Water	**Sewerage**
Service Charge	Nil	Nil
0 to 20,000 litres	$50.00/"000"litres/month	$25.00/"000"litres/month
Over 20,000 litres	$87.15/"000"litres/month	$43.58/"000"litres/month

b) The above rates and charges shall remain in effect for at least twenty-four (24) months of the effective date of this Determination Notice. During this period, RESL shall prepare and submit an application within twenty-one (21) months of the effective date of this Determination Notice.

7. Technical Review of Water Supply and Sewerage Systems

7.1. Subject to the provisions of the relevant Licences (water and sewerage), RESL has the obligation to provide the Richmond Estate subdivision/development with clean, safe, reliable, and efficient potable water and sewerage services, on a non-discriminatory basis. To satisfy these requirements, it is critical that the planning, management and operation of the respective utility systems, contemplate, among other things, the following:

- Ongoing assessment of aggregate water demand requirements/ system supply capacity;
- Monitoring of sewage/wastewater flows, volumes, treatment capacity, and treatment facilities;
- Periodic review of the water supply/sewerage infrastructure configuration and capacity for adequacy and flexibility;
- System optimization strategies and cost control measures to ensure sustainable utility operations;
- Maintenance approach that bolsters operational performance and assures service continuity and reliability;
- Energy efficiency (EE) measures to reduce energy requirements and operating costs;
- Feasible power supply options for operational flexibility, reliability and resilience;
- Collection and reporting of system performance data/parameters for regulatory assessment and monitoring by the OUR;

7.2. These requirements and considerations should provide a sound basis for the company to carry out the licensed business, as defined, in order to satisfy the prescribed utility service requirements in its development over the term of the respective Licences, while ensuring environmental and economic sustainability.

RESL Water Supply System

7.3. RESL's water supply system depicts a feasible designed configuration, which is commonly utilized by small water utilities across the industry. As built, the system comprises the main infrastructure components, including water abstraction facilities, water treatment, distribution network, instrumentation, controls and metering devices. These facilities are described below.

Water Source, Abstraction and Production

7.4. Based on RESL's system description, the main source of raw water to supply the development is a deep-water well (depth - 160ft), developed on the Richmond Estate property in close proximity (700ft) to the water treatment facility, which is linked to the well by a 6-inch diameter pipeline. During system operation, a submersible well pump (capacity - 600 gpm), driven by a 60HP, 415V, 3-phase electric motor, is used to abstract raw water from the well within the limit of 3,500 m^3/day authorised by the Water Resources Authority (WRA) licence. Based on the process flow, after raw water abstraction, it is treated and sent to storage, then distributed and delivered to customers. According to RESL, as a reliability measure, an equivalent spare well pump/motor set is available at the facility, for immediate installation in the event of a major failure or significant degradation in operating performance.

7.5. To supplement the input water requirements, RESL indicated that a secondary source is available for raw water abstraction from Coolshade Spring located at Liberty, St. Ann. However, the technical review found that the related water abstraction licence previously issued by WRA expired in 2020 January. The company has indicated that an application for the renewal of this licence was submitted to the WRA and the processing is in progress. Given this development, the company will be required to provide notification to the OUR of the renewed licence and submit a copy of the document, when received.

Water Treatment

7.6. The water treatment process is fully automated, and includes water filtration, backwash, and disinfection with ultraviolet (UV) light and chlorine. These facilities are utilized to perform the requisite treatment to achieve the prescribed water quality standards. The water treatment flow process is described as follows:

- The initial stage of water treatment is filtration, where the abstracted raw water is fed into Macrolite sand filters (installed in parallel for operational flexibility and reliability), to facilitate the removal of all particulate material greater than 5 microns.
- The filtered water, then flows through a water softener (ionic exchange technology) to reduce hardness.
- After filtration and softening, the next stage is chlorination, where liquid chlorine is injected into the water to achieve the required residual chlorine value (2 ppm). To enhance the chlorination process, inline UV water purification is applied to optimize the use of chemicals in achieving the prescribed water quality standard. As observed, all pumps/motors have variable speed drives and controlled by programmable logic controllers (PLC), which appear to be functional and technically suitable. For reliability, a spare chlorination pump is available at the facility.
- Verification of water quality is done by testing of water samples collected at designated sampling points within the system.

Water Storage and Distribution

7.7. The water storage and distribution network is designed and constructed such that during system operation, treated water is pumped to two (2) above ground vertical storage tanks with total capacity of 1.45 million USG (Tank#1 - 741,000 USG and Tank#2 - 709,000 USG), equivalent to six (6) days of supply to the development, based on current usage. For the distribution of potable water, a smart duplex pumping system with built in redundancy is utilized to regulate water flow and demand while maintaining pressure within a specified range.

Water System Power Requirements

7.8. The main electrical power source to the system is the JPS electricity grid, delivered as a 415V, three-phase AC supply. As observed, this arrangement appears to be compatible with the power requirements of the relevant electrical equipment (pump motors and other equipment) and should be sufficient for proper electrical operation. For back-up power, a standby diesel generator with adequate capacity to power the system's critical electrical equipment is available, although its operability was not validated due to its standby status at the time of inspection. It is important to note that based on the system design configuration, the operation appears to be highly energy-intensive, which implies susceptible to power supply failures/interruption. Given this dynamic, the availability of equivalent back-up/standby

power supply for the system, at all times is essential to mitigate operational risks and minimize the potential for water service disruptions.

Water Demand and Supply Capacity

7.9. According to RESL, the estimated total daily water demand of the development is 500,000 gallons per day (GPD), over the term of the Licence, with system design flow capacity of 360 gallons per minute (GPM) or 518,400 GPD. Taking into consideration peak use factors and current average consumption (approximately 230,000 GPD), the demand projection relative to system design capacity, indicates that the company should be able to adequately supply potable water to all customers in the development, with sufficient margin, on a sustained basis.

Water Balance

Based on RESL's performance data, the annual water production, consumption, and Non-Revenue Water (NRW) are given in the water balance presented in Table 7.1 below.

Table 7.1: RESL's Annual Water Balance

RESL 2018 Water Balance			
Category	**Water Volume** (Million Gallons)	**Proportion**	**Remarks**
Revenue Water	42	50%	
NRW	42	50%	
Production	84	100%	Maximum permitted annual production – 337.5 million gallons

7.10. As indicated, the current water production level accounts for approximately 25% of the achievable maximum annual water production based on the maximum abstraction rate (3,500 m^3/day), stipulated by the WRA Licence. Based on this indication, it can be deduced that the system will have sufficient capacity to satisfy incremental water demand requirements with adequate margins, over the term of the water supply Licence.

7.11. With respect to NRW, the current level reported by RESL is approximately 50% of annual water production, which appears to be excessive given the size and scale of the system. According to RESL, this NRW level is largely due to authorised unmetered water usage in the development, including the following operations:

1) Supermarket owned by RESL;
2) Construction activities in the development being done by the company;
3) Office canteen and staff change rooms activities; and
4) Sewerage plant operation wash down etc.

7.12. In water companies' operation, NRW mainly involves water losses, which is comprised of two major components: apparent losses and real losses. Apparent losses relate to unauthorised water consumption, metering inaccuracies, billing and accounting errors. If not addressed, these losses can become problematic, consequently depriving the company of needed revenues and distorting customer consumption data and usage patterns. On the other hand, real losses are physical water losses (mainly leakages) in the distribution network, which can severely affect the company's operations with significant cost implications. In that context, the indicated NRW constituents should not be reported as actual water losses

as defined, but rather as RESL's unbilled internal commercial water consumption. Accordingly, the estimated water volume of each component should be accounted for as water sales and not NRW. On that basis, the company needs to take appropriate action to address this situation. In the case of the sewerage plant operation, this is a separate service governed by a different licence. Therefore, any water input to the sewerage operation from RESL water supply system, should be metered and billed. Additionally, it should be noted that the water balance does not provide any specific information on fire water requirements.

Management and Operation of Water Supply System

7.13. The management approach adopted by RESL for governing the long-term operation of the water supply system appears to be practical and workable and should enable the company to carry out the licensed business, as defined, over the remaining period of the subject Licence.

OUR's Technical Review – Water Service

Pursuant to Schedule 2 of its water supply Licence, RESL is required to submit to the OUR on an annual basis, the following technical information and reports:

a) Volume of water produced;
b) Volume of water sold;
c) Assessment of Unaccounted-For-Water (UFW);
d) Consumption per customer category;
e) Details of any unserved demand;
f) Water quality reports;
g) Schedules of maintenance programme;
h) Reliability of supply report for relevant period detailing:
    - Number of planned interruptions;
    - Percentage of planned interruptions where the required 24-hour period of Notice is not adhered to;
    - Number of unplanned interruptions; and
    - Percentage of unplanned interruptions not restored in the required 24-hour period.

7.14. Given the vital importance of the prescribed water services to the development, these regulatory requirements should be a key focus for RESL. Further, with continuous assessment and monitoring, the company should be able to improve performance and operate on a sustainable basis over the term of the Water Supply Licence.

Water System Regulatory and Performance Requirements

7.15. Taking into consideration the conditions of the Licence and indications from the OUR's technical review, to effectively evaluate and monitor RESL's water service performance, the company will be required to satisfy the technical requirements, delineated in the sections below.

Technical Reports

7.16. Periodic technical reports on RESL's operations are necessary to enable the OUR to execute its regulatory and monitoring functions, in relation to the prescribed water utility services.

Given this imperative, as part of the reporting framework, the company shall submit to the OUR, the following reports:

- Quarterly "Technical Reports" covering the parameters/indicators set out under Schedule 2 of the Licence, prior to the submission of the full annual reports, for each of the remaining years of the Licence. Such reports shall be submitted within fourteen (14) days after the end of each quarter; and
- Any other technical data/reports related to the system that the OUR may consider necessary, from time to time.

Water Service Standards

7.17. Based on the design specifications/operating characteristics of the water supply system, it is expected that service delivery will meet or exceed the stipulated standards and conditions, and should be manifested in the customers' quality of service experience. With respect to customer education, consistent with prudent utility practice, RESL shall ensure that the relevant description and performance measures of the prescribed standards are properly documented, sufficiently quantified (where applicable) and made accessible to its customers. In consideration of these conditions, it should be recognized that non-conformance with defined service level requirements may result in unfavourable outcomes and unrealised objectives. The service standards applicable to RESL water utility operations mainly entail the following aspects.

Availability and Reliability of Supply

7.18. This component relates to the availability and continuity of potable water services to all customers connected to the water supply system and is considered a key factor for assessment of overall system reliability and service delivery performance. It involves frequency, duration, and severity of water supply interruptions (planned and unplanned), as well as daily water demand/capacity dynamics, and other relevant indicators. Notably, the current customer base (residential and commercial customers), does not reflect total projected water demand for the complete development, as the construction of housing units is still in progress. Nevertheless, the company has the obligation to provide full (100%) water coverage in the development with acceptable quality and reliability, at full occupancy.

Water Quality

7.19. This standard covers water conditions, including microbiological concentrations, turbidity, colour, pH, and residual chlorine, which must be analysed and regulated by RESL during the water treatment process, subject to the requirements of the Licence, relevant health and safety standards/regulations, prudent utility practice, and international best practices. In the context of this standard, it is important to note that contamination of drinking water constitutes a major burden on human health; therefore, interventions to assure and improve water quality can provide significant benefits to society. Given this imperative, RESL shall supply potable water to the development with quality that meets the prescribed water quality standards, for the remaining period of the Licence. Notwithstanding, these are minimum requirements, therefore, as a matter of public safety RESL should endeavour to maintain potable water quality at the highest possible level.

7.20. Regarding the reporting of water quality, to supplement the annual water quality reports, RESL shall provide all relevant water quality information, including test results, in the quarterly technical reports to be submitted to the OUR. The company shall also ensure that

the water quality test results and other relevant water quality information are made accessible to customers on an ongoing basis.

Water Pressure

7.21. As stipulated by the Water Supply Licence, RESL shall ensure that the pressure of the water supplied to customers is maintained in the range of 20 - 60 PSI. Based on inspection, the system appears to be equipped with the necessary facilities for proper water pressure/flow management. Given this capability, RESL is expected to reasonably comply with this service standard, on an ongoing basis. Additionally, all water pressure measurements/indicators recorded by RESL during the relevant periods, shall be reported in the quarterly Technical Reports to be submitted to the OUR.

Planned and Unplanned Interruptions

7.22. Schedule 2 of the water supply Licence stipulates that RESL shall keep records of all planned and unplanned water service interruptions detailing: dates, times, affected area, number of affected customers and related notices provided. Notably, this information is essential to facilitate the OUR's periodic review of the system's reliability performance. Importantly, this service standard also requires RESL to:

- Provide notification time for at least 90% of planned interruptions.
- Restore at least 90% of unplanned interruptions of water supply within the period communicated to customers.

Additionally, RESL shall include the defined quality of service information in the quarterly technical reports to be submitted to the OUR.

Water System Guidance Framework/Action Plan

7.23. Given its technical/operating characteristics and the existing management strategy, the water supply system is expected to operate within functional specifications to deliver safe, adequate, efficient, and reliable water services to the development over the term of the Licence. Notwithstanding, to ensure the realization of this outcome, it is necessary for RESL to develop a Guidance Framework/Action Plan, including requirements pertaining to system planning, operations, maintenance of facilities, as-built network diagrams, and risk assessment. This Framework/Action Plan shall be submitted to the OUR within three (3) months of the effective date of this Determination Notice.

Water System Environmental Requirements

7.24. In the operation of the Licensed Business as defined by the Water Supply Licence, RESL shall conform to all relevant environmental standards established by the National Environmental Planning Agency (NEPA) and the Natural Resources Conservation Authority (NRCA). RESL shall also provide the OUR with copies of any related licences, or special permits issued to the company by these entities, from time to time.

Water Abstraction Authorization

7.25. To ensure authorized raw water extraction, RESL shall provide timely notification to the OUR of all applications for renewal of its water abstraction licence to the WRA, and provide copies of such renewed licenses.

Fire Water Requirements

7.26. No specific information on fire water requirements was provided. This is a critical element of all water supply networks for public safety purposes. As such, periodic fire water flow assessments should be undertaken by the company to ensure that the related facilities are capable of performing effectively. Fire water flow is also a critical component for pressure management in the network. Further, water for fighting fires in the development is considered an emergency service, which is expected to be provided by RESL. Therefore, the company should ensure that there is available water supply, network capacity and functional facilities to guarantee this crucial essential service at all times, while at the same time, meeting the potable water demand in the development.

Revenue Metering

7.27. With respect to the Licenced Business, as defined, RESL shall ensure that all revenue-type water meters to be installed within the service area are in conformance with the requirements of the Water Supply Licence and the Meter Testing Administrative and Operational Protocol for the Electricity and Water Sectors in Jamaica, 2017 (MTAOP), and any later version, or other superseding instrument. With respect to the existing metering devices, RESL shall submit the following information to the OUR for review, within one month of the effective date of this Determination Notice.

1) Listing of all water meters (revenue-type) installed at each service connection in MS Excel format, which shall include:
   a) The meter type
   b) The meter manufacturer's serial number
   c) RESL assigned meter number
   d) Meter installation date
   e) The specific meter location/service address
   f) RESL customer/premises number
   g) Copies of any related Pattern Approvals and Acceptance documents

2) A description of RESL's water meter procurement process.

Water System Operation

7.28. To provide a reliable water supply service at reasonable rates, it is expected that the company will seek to ensure the optimization of system operations at all times, to minimize total operating costs, while improving efficiency, reliability and quality of service performance. While the realization of this objective is essential, it is also imperative for the company to employ prudent measures to limit degradation of key system assets over time. Taking into consideration these conditions, RESL shall develop appropriate policies and procedures for long-term operation of the water supply system, with focus on critical infrastructure/equipment. These procedures shall be included in the requested Framework/Action Plan.

Energy Efficiency – Water Service

7.29. The provision of potable water service in the development is deemed a highly energy-intensive activity. Based on the existing operation, electrical energy is needed for raw water extraction and conveyance, water treatment, water distribution and storage, with most energy consumption attributed to pumping requirements. This suggests the need to integrate EE in the management and operation of the water supply system, which can contribute to long-

term sustainability of the company by lowering energy use and reducing costs. The extent of RESL energy consumption and related costs, should provide an incentive for incremental improvements in EE, some of which can be realized through a range of initiatives, including:

- Incorporating EE practices into daily system operations;
- Optimization of system operations;
- Utilizing new, energy-efficient technologies;
- Installing premium efficiency motors and variable speed drives (VSD);
- Developing alternative pumping schemes and pump system upgrades;
- Installing adequate controls and monitoring systems;
- Conducting benchmarking and energy audits;
- Shifting power consumption from on-peak to off-peak hours;
- Adding storage or more effectively using existing storage facilities;
- Promoting water conservation and use of energy efficient equipment/products; and
- Reducing water losses/leakages.

Water System Maintenance Requirements

7.30. As set out under clause 6 of the Water Supply Licence, RESL shall maintain and keep in good repair all equipment used in carrying out the Licensed Business, as defined, in accordance with the legal and regulatory framework. Prudent industry practice also supports the development and adherence to appropriate maintenance policies/procedures that will assure efficient, reliable and cost-effective water infrastructure operations.

7.31. Taking into account these conditions, RESL shall develop appropriate policies/procedures to guide the maintenance of the water supply infrastructure, which shall be included in the requested Framework/Action Plan. The company shall also develop an overall Maintenance Plan for the water supply infrastructure for three (3) years in advance. The plan shall take into account OEMs' recommendations for equipment maintenance, schedule of inspections and major maintenance activities, contingency equipment and replacement inventories, as-built network diagrams, and statutory maintenance requirements, where applicable. The company shall submit this Maintenance Plan to the OUR, within three (3) months after the effective date of this Determination Notice. Thereafter, the plan shall be reviewed annually and updated as necessary, then submitted to the OUR in January of each year, for the remaining period of the Water Supply Licence.

Risk Management Strategy - Water Service

7.32. Concerning system risks, the OUR's technical review has identified certain contingencies and exceptional circumstances that could adversely affect water services in the development, in the event they occur. Such circumstances include the following:

- Major failure or forced outage of critical infrastructure/equipment;
- Forced outage of storage tanks due to major leaks or contamination;
- Power supply failure;
- Disruption to raw water inflows;
- Contaminated raw water source (well, aquifer, etc.);
- Infiltration and ingress of contamination in the distribution system; and
- Effects of climate change, seasonal variations and natural disasters.

7.33. While the water system design/configuration inherently addresses some degree of risk, the potential impacts and exposure from the identified threats, may not have been fully contemplated. Taking into consideration these conditions and other possible threats, their potential consequences, and associated system vulnerabilities, it is considered prudent that RESL develop an appropriate risk management/resilience strategy for continued assessment, mitigation and adaptation, in relation to the water supply system. This risk management/resilience strategy shall be included in the requested Framework/Action Plan.

Water Service Compliance Requirements

7.34. Based on the OUR's technical review of RESL's water supply system/services, the requirements to be addressed by the company are summarized in Table 7.2 below.

Table 7.2: RESL Water Service Technical Requirements for Interim Tariff

RESL Water Service Technical Requirements		
Index	**Aspect**	**Items to be submitted to the OUR**
1	Water Abstraction	i. Notification on receipt of renewed water abstraction licence for Coolshade Spring, Liberty, St. Ann. Submit copy of licence document.
2	Technical Reports	i. Quarterly "Technical Reports" covering the parameters/requirements set out under Schedule 2 of the Licence, to be submitted within fourteen (14) days after the end of each quarter; and ii. Any other technical data/reports related to the system that the OUR may consider necessary, from time to time.
3	Availability and Reliability of Supply	i. A Guidance Framework/Action Plan, including requirements pertaining to the planning, operations, maintenance of facilities, network diagrams, and risk assessment. This shall be submitted to the OUR, within three (3) months after the effective date of this Determination Notice.
4	Water Quality	i. Annual water quality reports and quarterly water quality information, including test results, included in quarterly Technical Reports.
5	Water Pressure	i. Reporting of water pressure measurements in the quarterly Technical Reports.
6	Planned and Unplanned Interruptions	i. Service quality performance information, which shall be included in the quarterly Technical Reports.
7	Revenue Metering	i. Listing of all revenue-type water meters installed in the service area in MS Excel format, which shall include: a) The meter type b) The meter manufacturer's serial number c) RESL's assigned meter number d) Meter installation date e) The meter location/service address f) Customer/premises number g) Copies of any related Pattern Approvals and Acceptance documents. ii. A description of RESL's water meter procurement process.

RESL Water Service Technical Requirements		
Index	**Aspect**	**Items to be submitted to the OUR**
		iii. This information shall be submitted to the OUR within one (1) month of the effective date of this Determination Notice.
8	System Operation	i. Operating policies and procedures for prudent operation of the system, including critical equipment and facilities, which shall be included in the requested Framework/Action Plan.
9	Maintenance	i. Policies and procedures to guide the maintenance of the water supply infrastructure, which shall be included in the requested Framework/Action Plan. ii. An overall Maintenance Plan for the water supply infrastructure, for three (3) years in advance. The plan shall take into account the OEMs' recommendations for equipment maintenance, schedule of inspections and major maintenance activities, contingency equipment and replacement inventories, and statutory maintenance requirements, where applicable. The company shall submit the plan to the OUR, within three (3) months after the effective date of this Determination Notice. ii. Thereafter, the plan shall be reviewed annually and updated as necessary, then submitted to the OUR in January of each year, for the remaining period of the Licence.
10	Risk Management	i. Risk Management/Resilience strategy to assess and mitigate potential risks to the water supply system, which shall be addressed in the requested Framework/Action Plan.

RESL Sewerage System

7.35. The orientation of RESL's sewerage system depicts the typical design configuration of small wastewater systems in operation across the industry. It encompasses the essential components, including collection, conveyance, treatment and disposal; and is constructed with adequate capacity to provide 100% sewerage coverage to the development. Based on NEPA's Permit (dated 2011 February 22), the permitted activity involves the construction and operation of the sewage treatment facility for residential, agricultural, light industrial and commercial uses, with estimated daily sewage generation of 1,980 m^3/day. The system is necessary to ensure that sewage generated in the service area is properly collected, transported, and treated to the required degree, then disposed of without causing any health or environmental problems. The main system components are described below.

Sewage Collection and Conveyance

7.36. The sewage collection network operates as a sanitary sewer or "separate sewer" with capacity based on design sewage flow, estimated from forecasted population density, and projected water consumption (residential, commercial and industrial) over the term of the Sewerage Licence. As designed, this sewer is not expected to receive storm/rain water runoff; therefore, strict inspection should be persistently performed to eliminate or restrict entry of these wastewater sources to insignificant levels. Service connections to the sewage collection network are effected by manholes for operational flexibility and ease of maintenance. During operation, the collected sewage flows to a lift station, which facilitates conveyance to the treatment plant, where the various stages of treatment are effected.

Sewage Treatment

7.37. Sewage treatment is a very crucial aspect of the operation and is necessary for meeting the standards prescribed by the Sewerage Licence, NEPA permit and relevant health and safety regulations. Based on design and operation, the treatment process involves the following:

Screening and Grit Removal

7.38. This operation is the first step in sewage treatment works and it is essential for the removal of materials, which would otherwise damage equipment, interfere with the satisfactory operation of the treatment facilities or cause objectionable environmental conditions. This is achieved by means of a screen and grit chamber installed before the inlet of the aerated sewage ponds, with sewage flow at the design velocity to ensure efficient and complete removal of suspended/floating materials of certain size without undue deposition of solids.

Biochemical treatment:

7.39. After screening and grit removal, facultative biochemical treatment is performed in sequential stages, using the following components:

- Two (2) multi-cell aerated ponds with floating baffle curtains, with total capacity of 3,028 m^3.
- Four (4) Reed Beds, each with capacity of 1,580 m^3.

Disinfection

7.40. Disinfection of the treated sewage from the secondary aerobic biological process is necessary to ensure that the effluent discharge does not result in hazards. At the facility, this is accomplished using a chlorine contact chamber with automatic injection of chlorine into the effluent, which is detained in the chamber for a contact time of 30 minutes. The residual chlorine after contact should exist in an acceptable range to prevent offensive odours, which is a service standard defined by the Sewerage Licence.

Effluent Disposal

7.41. Based on present operation, effluent is discharged into the Richmond Gully via a storm water detention pond on the property. However, according to NEPA's Permit, the effluent will be used for irrigation, with the excess discharged as described. Regarding this condition, RESL will be required to update the OUR on such arrangement.

Sewerage System Power Requirements

7.42. The main electrical power source for the sewerage system is a dedicated 415V, three-phase AC supply provided by JPS. The characteristics of this power supply arrangement appear to be compatible with the electrical specifications of the relevant electrical equipment and should support proper electrical operation.

Management and Operation of the Sewerage System

7.43. The approach adopted by RESL for managing the long-term operation of the sewerage system appears to be workable and should enable the company to carry out the Licensed Business, as defined, over the remaining period term of the Sewerage Licence.

OUR's Technical Review – Sewerage System

7.44. Pursuant to Schedule 2 of the Sewerage Licence, RESL is required to submit to the Office on an annual basis, the following technical information and reports:

1) Costs and revenues associated with each customer category
2) Customer based reports showing total number of customers per category (that is, industrial, commercial or domestic)
3) Number and type of connections to other utilities
4) Sewerage report of the relevant period detailing:
    - total volume of sewerage collected from other utilities
    - total volume of sewerage treated
5) Effluent quality reports for each quarter
6) Schedules of maintenance programme
7) Number of employees
8) Total number of new applications
9) Total number of new sewerage connections
10) Total number of delinquent customers (three billing period in arrears)
11) Fault (blockages) reported in collection, conveyance and treatment
12) Average time taken to clear faults
13) Comparison with NEPA environmental quality standards
14) Facilities in/out of service and period of time out
15) Treatment capacity of sewerage plants:
    - plant type (ponds, package, etc.)

- installed capacity
- average throughput
- availability

7.45. In addition to the named annual reports, RESL is expected to provide quarterly reports on its sewerage service operations to the OUR. Given the critical importance of the prescribed sewerage services to the development, these regulatory requirements should be a key focus for RESL.

Sewerage System Regulatory and Performance Requirements

7.46. Taking into consideration the requirements of the Sewerage Licence and indications from the OUR's technical review, to effectively evaluate and monitor RESL's sewerage service performance, the company will be required to satisfy the technical requirements, delineated in the sections below.

Technical Reports

7.47. To enable greater oversight of RESL's sewerage service performance, the company shall submit the following to the OUR:

- Quarterly "Technical Reports" covering the parameters/indicators set out under Schedule 2 of the Licence, prior to the submission of the full annual report, for each of the remaining years of the Sewerage Licence. Such reports shall be submitted within fourteen (14) days after the end of each quarter; and
- Any other technical data/reports related to the system that the Office may consider necessary, from time to time.

Sewerage Service Standards

7.48. Based on the design specifications and operating characteristics of the sewerage supply system, it is expected that the service will meet or exceed the stipulated standards, and this should be manifested in the customers' quality of service experience. In carrying out the Licensed Business, (collection, conveyance and treatment of sewerage and disposal of effluent), RESL shall at a minimum, meet the following service standards stipulated by the Sewerage Licence:

Blockage of Sewer Mains

7.49. RESL shall clear 90% of all reported blocked sewer mains within 4 hours of receiving such reports. For effectiveness, this performance measure should be in coordination with the company's monitoring and maintenance strategy for target achievement and limiting service disruptions.

Odour Control

7.50. RESL shall maintain the sewerage treatment plant in such a manner to minimize unacceptable odour conditions and complaints. The company shall ensure that there are no more than five (5) odour related complaints per one hundred (100) customers in any month of operation. This will require rigorous monitoring of the treatment process and proper

operation of the relevant facilities to prevent certain end products of the biological process (chemical compounds) from escaping the system and causing odour problems.

7.51. Given the necessity of the service, to the development, the OUR may from time to time, introduce additional or vary these sewerage service standards taking into consideration the company's performance in meeting these standards, which will be assessed at each tariff review.

Sewage Flow Requirements

7.52. Sewage flow is largely a function of population served, population density, and water consumption. As such, it is desirable that the RESL sewer network is designed for peak flows based on saturation density. Since these networks may be difficult and uneconomical to be subsequently enlarged or duplicated, they should have long design periods. Sewage flow should also take into account changes in internal water demand resulting from demand management initiatives.

7.53. The entire spent water of the service area should normally contribute to the total flow in the sewer. Although the flow in the sewer varies from hour to hour and also seasonally, under dry weather conditions, mean sewage flow may be significantly less than per capita water consumption. Since some water can be lost through evaporation, leakages, etc., this means that the sewer design should also contemplate the minimum sewage flow. Given this sewage flow dynamic, during system operation; sewage flow should be monitored by RESL to ensure proper performance.

Inflow and Infiltration

7.54. Estimate of sewage flow may also incorporate "inflow and infiltration" volumes of wastewater not produced by sewerage customers entering the network, (largely storm water and groundwater breaching the collection system at various points). Since sewers are designed for peak discharge, some allowance for groundwater infiltration should also be taken into account. Notwithstanding, excessive and uncontrolled infiltration could overburden the system. Therefore, prudent action should be taken by the company to limit sewer infiltration to acceptable levels.

Sewage Flow Velocity:

7.55. For proper operation, the flow velocities in the sewer network should be sufficient as to cause an automatic self-cleansing effect (suspended materials not get silted), while limiting erosion of the sewers. This is important to prevent deposition of solids that will obstruct free flow, causing further deposition and eventually resulting in complete blocking of the sewer. In addition, the flow velocities should also be self-oxidising. That is, the velocities should be sufficient to prevent the generation of gases that release bad odours. Given these operational considerations, RESL shall monitor the sewage flow velocities and conduct flow analysis to ensure suitable flow velocities during system operation. Flow measurements and reports of such flow analyses shall be included in the Quarterly Technical Reports to be submitted to the OUR.

Environmental Requirements

7.56. In the operation of the Licensed Business, RESL shall conform to all relevant environmental standards established by NEPA/NRCA, and shall also provide the OUR with copies of any related licences, or special permits issued to the company by these entities, from time to time.

Energy Efficiency – Sewerage System

7.57. Energy represents a substantial cost in the provision of wastewater services, as it is typically required for all stages in the treatment process, from the collection of raw sewage to the discharge of treated effluent. Moreover, the design and operation of these facilities do not usually contemplate EE as a key feature. As such, the OUR would urge RESL to consider the deployment of EE initiatives that can help to improve operational efficiency and reduce operating costs as well as environmental impacts.

System Operation and Reliability

7.58. To provide a reliable sewerage service at reasonable rates, it is expected that the company will take steps to ensure the optimization of system operations at all times, to minimize total operating costs, while improving overall performance. With respect to system reliability, it is imperative that RESL employ prudent measures to limit degradation and maintain operability of key system assets over time. In that regard, the company shall develop appropriate policies and procedures for long-term operation of the system, with focus on the critical infrastructure/equipment.

Sewerage System Guidance Framework/Action Plan

7.59. Given the technical/operating characteristics of the system, existing management approach, and optimization strategy, the system should be able to operate within the functional specifications to provide, safe, efficient, and reliable sewerage services in the development over the term of the Sewerage Licence. To ensure the realization of this outcome, it is necessary for RESL to develop a Guidance Framework/Action Plan, including requirements pertaining to system planning, operations, maintenance of facilities, network diagrams, and risk assessment. This Framework/Action Plan shall be submitted to the OUR within three (3) months of the effective date of this Determination Notice. The requested operating policies and procedures shall also be included in this Framework/Action Plan.

Maintenance of Sewerage Infrastructure

7.60. As set out under clause 6 of the Sewerage Licence, RESL shall maintain and keep in good repair all equipment used in carrying out the Licensed Business, as defined, in accordance with the legal and regulatory framework. Prudent industry practice also supports the development and adherence to appropriate maintenance policies/procedures that will assure efficient, reliable and cost-effective sewerage infrastructure operations.

7.61. Taking into account these conditions, RESL shall develop appropriate policies/procedures to guide the maintenance of the sewerage infrastructure, which shall be included in the requested Framework/Action Plan. The company shall also develop an overall Maintenance Plan for the sewerage infrastructure, for three (3) years in advance. The plan shall take into account OEMs' recommendations for equipment maintenance, schedule for sewer system cleaning and inspections, schedule of major maintenance activities, contingency equipment and replacement inventories, and statutory maintenance requirements, where applicable. The

company shall submit the Maintenance Plan to the OUR within three (3) months after the effective date of this Determination Notice. Thereafter, the plan shall be reviewed annually and updated as necessary, then submitted to the OUR in January of each year, for the remaining period of the Sewerage Licence.

Risk Management Strategy – Sewerage Service

7.62. With respect to system risks, the OUR's technical review has identified certain contingencies and exceptional circumstances that could adversely affect the provision of sewerage services in the development, in the event they occur. Such conditions include the following:

- Major failure or forced outage of critical infrastructure/equipment;
- Major sewage spills/overflows;
- Flooding;
- Power supply failure;
- Uncontrolled odour conditions; and
- Extended treatment plant shutdown due to process malfunction/poor effluent quality.

7.63. While the sewerage system design/configuration inherently addresses some degree of risk, the potential impacts and exposure from the identified threats may not have been fully contemplated. Taking into consideration these conditions and other possible threats, their potential consequences, and associated system vulnerabilities, it is considered prudent that RESL develop an appropriate risk management/resilience strategy for continued assessment, mitigation and adaptation, in relation to the sewerage infrastructure. This risk management/resilience strategy shall be included in the requested Framework/Action Plan.

Summary of Regulatory Requirements - Sewerage Service

7.64. Based on the OUR's technical review of RESL's sewerage system/services, the requirements to be addressed by the company are summarized in Table 7.3 below.

Table 7.3: RESL Sewerage Service Technical Requirements for Interim Tariff

RESL Sewerage Service Technical Requirements		
Index	**Aspect**	**Items to be submitted to the OUR**
1	Technical Reports	i. Quarterly "Technical Reports" covering the parameters/requirements set out under Schedule 2 of the Licence within fourteen (14) days after the end of each quarter; and ii. Any other technical data/reports related to the system that the Office may consider necessary, from time to time.
2	Sewage Flow	i. Sewage flow measurements and reports on sewage flow analyses, which shall be included in the quarterly Technical Reports to the OUR.
3	Environment Requirements	i. Copies of any licenses, or special permits issued by NEPA/NRCA to the company, from time to time.

RESL Sewerage Service Technical Requirements		
Index	**Aspect**	**Items to be submitted to the OUR**
7	System Operation	i. A Guidance Framework/Action Plan includes, requirements pertaining to system planning, operations, maintenance of facilities, network diagrams, and risk assessment. This shall be submitted to the OUR, within three (3) months after the effective date of this Determination Notice. ii. Operating policies and procedures for long-term operation of the system, with focus on the critical infrastructure/equipment, which shall be included in the requested Framework/Action Plan.
8	Maintenance	i. Policies and procedures to guide the maintenance of the sewerage infrastructure, which shall be included in the requested Framework/Action Plan. ii. An overall Maintenance Plan for the sewerage infrastructure for three (3) years in advance. The plan shall take into account OEMs' recommendations for equipment maintenance, schedule for sewer system cleaning and inspections, schedule of major maintenance activities, contingency equipment and replacement inventories, and statutory maintenance requirements, where applicable. The company shall submit the Maintenance Plan to the OUR three (3) months after the effective date of this Determination Notice. ii. Thereafter, the plan shall be reviewed annually and updated as necessary, then submitted to the OUR in January of each year, for the remaining period of the Licence.
9	Risk Management	i. Risk Management/Resilience Strategy to assess and mitigate potential risks to the sewerage system, which shall be addressed in the requested Framework/Action Plan.

Determination 2

RESL shall be required to meet the reporting requirements for the water and sewage services set out in Tables 7.2 and 7.3 of this Determination Notice.

8. Quality of Service Standards and Performance Criteria

8.1. Quality of service standards is critical for establishing the minimum quality of service customers should expect from the regulated service provider. These standards are important to customer satisfaction as well as to the reputation of the service provider. Against this background, and consistent with the general procedure for addressing quality of service standards in the water and sewerage sector, the Office has determined that RESL shall meet the Service Standards as set out in Schedule 2 of the Licence and shown in Tables 8.1, 8.2 and 8.3 below. However, the determination on the compensation mechanism and charge for a breach of a Guaranteed Standard will be suspended until the next review of rates. This will allow time for the proper understanding RESL cost and the quality of the service delivered.

Table 8.1: Water Supply Overall Standards

Category	Performance measure
A. Water Quality Standards	1. At least ninety-five percent (95%) of water samples must be collected from water production sources for testing; 2. At least ninety-five percent (>95%) of water samples must be negative with coli form bacteria; and 3. The level of residual chlorine should be between 0.5 and 5.0 mg/l and present in at least ninety-five percent (95%) of samples. 4. Any other standards imposed by the Ministry of Health from time to time.
B. Environmental Standards	*"The Licensee"* shall conform to all and any standards that may be established by NEPA/NRCA. *"The Licensee"* shall provide *"the Office*" with copies of any licences, standards, special permits issued by NEPA/NRCA from time to time, which shall form part of its licence.
C. Water Pressure	*"The Licensee"* shall ensure that the pressure of water to customers is in the range of 20 – 60 psi, and take all reasonable steps to ensure that customers receive an adequate and consistent supply of water at all times.
D. Planned and Unplanned Interruptions	Required notification time should be given for at least 90% of planned interruptions. At least 90% of unplanned interruptions of supplies should be restored within the period communicated by *"The Licensee"* to customers. *"The Licensee"* shall keep records of all planned and unplanned interruptions detailing: dates, times, affected area, number of affected customers and notice provided to them.

Category	Performance measure
E. Meter Testing	*"The Licensee"* shall ensure that meters to be installed on customer premises are batch tested by the relevant local authorities and thereafter tested once in every three (3) years to ensure accuracy in the measurement of supplies to customers.

"The Office" may from time to time, introduce additional or vary service standards **A** to **E** and will have regard to the performance of "the Licensee" in meeting these standards at the tariff review.

Table 8.2: Sewerage Supply Overall Standards

Category	Performance Measure
A. Environment Standards	*"The Licensee"* shall conform to all and any standards that maybe established by NEPA/NRCA. RESL shall provide *"the Office*" with copies of any licences, standards, special permits issued by NEPA/NRCA from time to time, which shall form part of its licence.
B. Service Standards	2. *"The Licensee"* shall meet, as a minimum the following service standards: a) *"The Licensee"* shall clear 90% of all reported blocked mains within 4 hours of the report being received; b) Odour *"The Licensee"* shall maintain the plant in such a manner as to minimize complaints of odour. There shall be no more than 5 complaints per 100 customers regarding odour in any month
C. Guaranteed Standards	*"The Licensee"* shall implement a scheme of Guaranteed Standards, which may be prescribed by *the Office* from time to time. In any such scheme, *"the Office"* will determine from time to time, the level of compensatory payment to be paid by *"the*

	Licensee" to the customer should *"the Licensee"* breach any standard so prescribed.
D. Billing	*"The Licensee"* (or its designee) shall provide appropriate bills to its customers on a monthly basis detailing the basis for all charges and specify the conditions for disconnection for non-payment.

Table 8.3: Water Supply Guaranteed Standards

Code	Guaranteed Standard	Mode of Compensation
GS1 – Connection of New Customers	RESL is required to connect all new customers complete with working meters, where water supply is available at the property boundary, within five (5) working days after signing the contract for connection.	Automatic
GS2 – Issue of First Bill	RESL must issue (print and mail/deliver) a bill to a customer based on a meter reading within thirty (30) working days after the account is opened.	Claim
GS3(a) – Response to complaints - Acknowledgements	RESL must, within three (3) working days acknowledge written customer complaints.	Claim
GS3(b) – Response to Complaints - Investigations	RESL must, within fifteen (15) working days of receipt of a complaint, complete investigation and inform the customer of the results.	Claim
GS3(c) – Investigations involving 3rd party	RESL must, within thirty (30) working days, complete investigation involving 3rd party.	Claim
GS4 – Wrongful Disconnection	RESL must, within twelve (12) hours, reconnect any supply that the company inadvertently disconnected and a written apology extended.	Automatic

Code	Guaranteed Standard	Mode of Compensation
GS5 – Repair or Replacement of Faulty Meter	RESL must, within ten (10) working days after detection, repair or replace any malfunctioning meter.	Automatic
GS6 – Meter Readings	RESL must render a bill based on a meter reading each month.	Automatic
GS7 – Reconnection after Payment of Overdue Amount	RESL must, within twenty-four (24) hours of receipt of all applicable payments (reconnection fee etc.) reconnect customers disconnected for debt.	Automatic
GS8 - Payment of Compensation	RESL must credit the customer's account within one (1) billing period after a breach of any of the prescribed guaranteed standards. For the avoidance of doubt, if RESL does not compensate the customer within the specified time, this results in another breach.	Claim

Determination 3

RESL shall be required to meet the Service Standards as set out in Schedule 2 of the Licence. The compensation mechanism and charge for a breach of a Guaranteed Standard shall be established at the next review of rates.

8.1. Customer Service Charter and Complaints Handling Procedure

8.2 The Office is of the view that some areas of service delivery are more appropriately addressed through the development of policies. In light of this, the Office takes the view that RESL's

Determination 4:

The Office has determined that RESL is required, within three (3) months of this Determination Notice, to develop and submit to the OUR for approval a Customer Service Charter.

service to its customers could be enhanced by way of a policy that clearly communicates its commitment to doing business with consumers. Accordingly, within three (3) months of this Determination Notice, RESL must develop and submit to the OUR for approval, a Customer Service Charter outlines its service delivery commitments, customers' rights and responsibilities, emergency procedures and contact details. This Charter must also detail the activities and timelines in its Complaints Handling Procedure.