REGULATED INDUSTRIES COMMISSION

REVIEW OF THE DRY SEASON PLAN REQUIREMENTS

FOR THE

WATER AND SEWERAGE AUTHORITY (WASA)

June

2021

Consultative Document

Contents

1.0 Introduction

1.1. Background

The Trinidad and Tobago Meteorological Service (TTMS) has forecasted warmer and longer dry seasons and reduced rainfall during wet seasons for the country[1]. Furthermore, research has shown that climate change will cause more water to evaporate during the dry seasons, complicating efforts to manage the water supply.[2] Although Trinidad and Tobago is not a water scarce country, the Water and Sewerage Authority (WASA) is currently unable to maintain a 24/7 water supply to all of its customers. Most customers receive a scheduled supply primarily because of inadequacies in the water distribution infrastructure. Intermittency in the water supply is further exacerbated during the dry season when limited rainfall decreases the availability of surface water. Harsher dry seasons can result in negative economic, social and environmental impacts on water resources (Wilhite, 2000)[3]. Some of these impacts include loss of water supply, additional strain on water resources, increased customer dissatisfaction and increased expenses for water resources management such as requiring higher levels of water treatment to provide potable water.[4] WASA, through the Water Resources Agency, is responsible for managing the water resources of the country. With the projection of seasonal changes impacting available supply in Trinidad and Tobago, it is apparent that more emphasis should be placed on water security[5], especially for the dry season.

[1] Trinidad and Tobago Meteorological Service projects an 8% shift in the duration of dry and wet seasons in the calendar year by 2050 that will allot more time to dry season. Projections show an increase of rainfall intensity over shorter periods that will result in lower surface water quality and less replenishing of groundwater resources.

[2] Konapala, G., Mishra, A., Wada, Y. & Mann, M. "Climate change will affect global water availability through compounding changes in seasonal precipitation and evaporation." Nature Communications, 2020;11 (1) DOI: 10.1038/s41467-020-16757-w

[3] Wilhite, D. 2000. Drought as a Natural Hazard: Concepts and Definitions. Drought, a Global Assessment.

[4] Gerber, N. & Mirzabaev, A. 2017. "Benefits of action and costs of inaction: Drought mitigation and preparedness – a literature review" Integrated Drought Management Programme Working Paper No. 1. World Meteorological Organization (WMO) and Global Water Partnership (GWP). 2017.

[5] Water security refers to the adaptive capacity to safeguard the sustainable availability of, access to, and safe use of an adequate, reliable and resilient quantity and quality of water for health, livelihoods, ecosystems and productive economies.

In 2007, the RIC published the document entitled "Submission of an Annual Water Preparedness Plan for the Dry Season by the Water and Sewerage Authority (WASA)", hereafter referred to as RIC Dry Season Plan Requirements (2007) document. The purpose of the document was to ensure that WASA produced a plan to mitigate the impacts of the dry season on water resources. The document provides guidelines to WASA for the preparation of the annual dry season plans. WASA is expected to assess the likely effect of the upcoming dry season and take steps to mitigate the impact on its ability to provide water supply to its customers. Annual dry season plans have been submitted to the RIC over the years, but they were not fully compliant with the requirements of the 2007 document. Also, given that the current requirements were published over 13 years ago, it was considered prudent to review them to ensure that they remain fit for purpose.

1.2. Purpose of this Document

This document is a review of the RIC Dry Season Plan Requirements (2007) document to assess whether it remains fit for purpose, and to address any shortcomings in the requirements with appropriate proposals.

1.3. Structure of this Document

The remainder of this document is divided into the following sections. **Section 2.0** identifies key lessons learnt from a review of water supply plans in other jurisdictions. **Section 3.0** reviews the RIC Dry Season Plan Requirements (2007) and proposes amendments and the rationale for the proposed changes. **Section 4.0** provides the conclusion and a summary of the recommendations.

1.4. Responding to this Document

In keeping with the RIC's obligation to consult, stakeholders are invited to comment on this document. All persons wishing to comment are invited to submit their comments. Responses should be sent by post, fax or e-mail to:

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All responses will normally be published on the RIC's website unless there are good reasons why they must remain confidential. Any requests for confidentiality must be indicated.

Deadline for submission of comments is July 23, 2021.

2.0 Experience in other Jurisdictions – Key Lessons

As part of the review of the dry season plan requirements, it was considered useful to examine the approaches in other jurisdictions, and to identify practices that can be employed to address challenges in the local context. Seasonal changes occur everywhere and can impact the water supply systems. Water is an essential but finite resource. Therefore, many jurisdictions have established plans to ensure that this resource is managed sustainably, and that the supply infrastructure remains functional and resilient during emergencies and periods of supply shortage. In this regard, several jurisdictions have developed drought management plans as opposed to dry season plans[6]. While there is a clear distinction between the dry season and a drought, some similarities exist in the impacts they have on the water supply system. In general, there is a recognition that water utilities must plan for seasonal variations at the very least. Additionally, the requirements of a drought plan can be adapted to suit the requirements of a dry season plan.

2.1. Mitigatation Measures from Global Examples

Dry season plans should not be limited to short-term measures that only address the issues of the upcoming dry season. They should include measures that address recurrent supply deficits that are due to structural and systemic issues within the supply network, thus taking into account factors that can negatively affect supply well into the future[7]. Similar plans have been adopted in other jurisdictions, such as Nebraska[8] and Texas[9] in the United States of America (USA), and the European Union (EU) [10]. These jurisdictions employ integrated water resource plans which consider drought conditions, and are required to address the impacts of severe drought for a predetermined period. The explicit requirement for plans to ensure sustainability supports the utilities' effort in working towards this goal. Hence, a dry season plan should ideally be part of long-term plans that take into account the risk of future impacts and provide sustainable mitigation measures.

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[6] Dry seasons are annual periods of low rainfall and humidity that increases the rate of evaporation from surface water sources. Droughts are periods where there is limited rainfall to replenish the available water supply.
[7] "National Drought Management Policy Guidelines" World Meteorological Organization, 2014.
[8] "The Near East Drought Planning Manual: Guidelines for Drought Mitigation and Preparedness Planning" National Drought Mitigation Center, University of Nebraska-Lincoln, Nebraska, USA. 2008.
[9] "A Water Plan for The Next 100 Years" Austin Water,
[10] "Drought Management Plan Report" European Communities, 2007.

When a dry season plan is placed within the context of long-term plans, the utility must shift its focus to preparedness and mitigation measures as opposed to relief measures. This shift in focus requires continuous effort as preparedness and mitigation for water supply issues require continuous identification and analysis of the contributing factors. Systems can be instituted to monitor water resources availability and to track the effectiveness of the dry season plans. Barbados and Jamaica, for example, have adopted plans for early warning systems for drought through monitoring and preparation[11]. In addition to monitoring, benchmarking can be used to compare performance levels to identify potential threats to water resources. In England and Wales, OFWAT, the Water Services Regulation Authority, relies heavily on benchmarking to regulate performance. OFWAT's regulatory model requires water utilities to provide performance data[12]. This approach allows both the regulator and utilities to assess performance and identify areas where improvements can be made, inclusive of drought preparedness.

Countries, such as the USA, Argentina and South Africa, have incorporated risk assessments in drought plans to identify possible threats to their water supply. In the USA, the America Water Infrastructure Act (AWIA), requires water utilities to carry out risk assessments on their supply network to evaluate potential threats to water supply and quality, and develop plans to address the risks identified. The Act mandates water utilities to assess risks associated with natural hazards, resilience of infrastructure, source water, water collection, distribution, monitoring practices, and the operation and maintenance of the system[13]. Argentina and South Africa also use risk assessments to determine the impact of drought on agriculture. In both countries, the risk assessments provide information to the water utilities that are factored into their plans to manage the water supply system.

The EU has established a conceptual framework that addresses the challenges of climate change, its effects on water supply and the importance of identifying critical areas[14]. The

[11] Trotman, A. 2013. "Early Warning Information Systems: An essential ingredient for Drought Management in the Caribbean" Third International Conference on Climate Services. 2013.
[12] "Water Regulation: Separate Regulatory Body with Licensing Regime" Public-Private Partnership Legal Resource Center, World Bank Group. 2019.
[13] "America's Water Infrastructure Act of 2018: Risk Assessments and Emergency Response Plans" United States Environmental Protection Agency. 2019. https://www.epa.gov/waterresilience/americas-water-infrastructure-act-2018-risk-assessments-and-emergency-response-plans
[14] "Drought Management Plan Report" European Communities, 2007.

framework is used to support policymaking decisions to implement risk assessments. The EU proposes that several key factors be included to define drought events, such as frequency, severity, intensity, duration and area affected.

Key lessons from the international experience point to a focus on drought mitigation as opposed to seasonal plans, while this does not negate the need for a dry season plan, it underscores the importance of ensuring that the annual dry season plans are developed in the context of a longer-term plan. There is also a focus on risk based assesments as opposed to reactive measures and an emphasis on performance monitoring in certain jurisdictions such as in England and Wales.

3.0 Review of Existing Requirements

This section reviews the specific requirements included in the RIC Dry Season Plan Requirements 2007, and assesses whether they remain fit for purpose. The major sections of the document are examined, and the shortcomings are identified and discussed. It also presents recommendations and discusses the rationale for the proposed changes. **Section 3.1** provides information on the remit of the RIC and the legislation that empowers the RIC to specify and request information from the service provider. **Section 3.2** analyzes the specific requirements of the dry season plan which aim to ensure that WASA implements measures to mitigate the negative impacts of the dry season on available supply. **Section 3.3** discusses the submission and publication details of the dry season plan. **Section 3.4** examines the compliance and reporting requirements for the development and implementation of dry season plans.

3.1. Purpose and Authorizing Provisions

The "Purpose and Authorizing Provisions" section specifies the purpose of the RIC Dry Season Plan Requirements 2007 document, the responsibility of the RIC, the legislative framework that enables the RIC to request information from WASA and the expected outcomes. This section serves as an introduction to the document and provides the context for the succeeding sections of the document.

The "Purpose and Authorizing Provisions" section states as follows:

"This document sets out the Regulated Industries Commission's (RIC) requirements for the Water and Sewerage Authority (WASA) to prepare and submit annually a Water Preparedness Plan for the Dry Season.

As the economic regulator of the water and electricity sectors, the RIC is responsible for regulating prices and standards and conditions of service. In performing its functions, the RIC is guided by the legislative and regulatory framework set out in the RIC Act No. 26 of 1998.

The RIC has an express power under Sections 57 to 60 of the Act to call for any information and "be furnished within the time and in the manner and form and with such particulars and certification as are required" for the purpose of carrying out duties under the Act.

The information provided to the RIC is intended to enable the RIC to see how well WASA is prepared to:

- *manage and minimize the impact on water supply during the dry season;*
- *minimize supply restrictions during the dry season;*
- *identify and respond to emergencies (hot spots) that have the potential to impact on customers' water supply during the dry season;*
- *keep customers informed of water supply issues over the dry season period; and*
- *monitor and assess the effectiveness and compliance with the implementation of the dry season plan."*

This section identifies the components that the RIC believes will enable WASA to mitigate the impacts of the dry season on the country's water supply and, outlines the objectives of the plan to be submitted by the utility. The core objectives, as outlined for the intended outcome of WASA's plan, remain relevant as they cover important areas such as ensuring the utility puts in place measures to manage and mitigate the effects of the dry season, respond to emergencies, communicate with cutomers and the need to continuously monitor and assess performance. It highlights, in essence, key elements that WASA needs to be cognizant of when preparing its dry season plan.

Notwithstanding the above, the RIC is of the view that the following additional element should be incorporated. The plan should provide the background and context to WASA's preparation of the annual dry season plan, in order to inform the RIC how the plan fits within a the wider long-term planning framework to address the issues associated with

successive dry seasons. This will encourage WASA to take a more proactive approach to planning for the dry season.

Do you agree that the Dry Season Plan should include a Requirement to consider long-term plans to mitigate water availability issues?

3.2. Contents of Dry Season Preparedness Plan

The section entitled "Contents of Dry Season Preparedness Plan" stipulates the specific information that WASA is required to submit, to demonstrate that it is undertaking the activities necessary to mitigate the negative impacts of the dry season. This information allows the RIC to assess if WASA's plan is feasible and adequate. The information required here includes provision of information on the specific activities to be undertaken before the start of the dry season, emergency response plans and water supply schedules. This section is important because these components are essential for an effective dry season plan. The requested information is directly aligned with the intended purpose of the Dry Season Plan Requirements (2007) document.

The "Contents of Dry Season Preparedness Plan" states as follows:

"WASA must include the following information in the Plan:

- *specific activities to be undertaken before the start of the dry season and a timetable for implementing those activities, including:*
    - *capital expenditure programmes and initiatives; and*
    - *operational and maintenance expenditure programmes and initiatives;*
- *the capacity of WASA to manage and respond to extreme weather events and emergencies, including:*
    - *emergency response programmes;*

- *the capacity of existing telephone and other customer information systems over the dry season;*
- *its public communications strategy;*
- *the ability to call on extra financial and human resources; and*

- *dry season schedules."*

Information on capital expenditure investments[15] and operational activities[16] provide a picture of activities that WASA will undertake to address the expected impacts. WASA is also required to report on measures taken and their effectiveness. More granular details, such as volume of water supplied and number of customers that benefited in a specific area, would add such reports.

This section also specifies that WASA is required to provide information on its capacity to manage certain aspects of its operations, particularly during emergencies. It specifies the inclusion of emergency response programmes in the dry season plan. Emergency response programmes may be misconstrued as allowing a reactive approach to managing the dry season situation. Another concern is that the term "emergency response" may unintentionally convey to the utility that preventative measures are not as important. The RIC, therefore, intends to rename the requirement of "emergency response programmes," to "contingency programmes" and include a requirement for a risk management system, with more emphasis on the use of proactive measures, for ensuring the availability of supply. By shifting the focus towards risk management, the requirements will include a combination of proactive and reactive measures such as the inclusion of a water security index that signals the severity of the supply deficit and the corresponding response to mitigate the impacts.

[15] E.g. new water treatment plants and well production plant installations.
[16] E.g. increased capacity for truck borne water supply, leak repair programmes, and well rehabilitation.

The RIC also stipulated that the plans should contain information about WASA's communications system and their customer information system. However, the requirements do not clearly define this system. The requirement was intended for WASA to have an effective system for providing information to customers during the dry season. As it is presently stated, it does not provide a proper indication of what is required. The RIC, therefore, proposes that this be clearly specified in the requirements.

Current requirements also specify that WASA provides information on its ability to call on extra financial and human resources when required during instances of extreme weather events or emergencies. Hence, WASA may be required to undertake additional projects or deploy personnel to ensure the continuity of supply to customers during such events. These projects would require financial and human resources. Therefore, this requirement remains fit for purpose, and WASA will be required to continue providing this information as part of the dry season plan.

Lastly, WASA is required to provide dry season schedules as a part of the plan. These specify the frequency and duration of delivery of a the pipe-borne water supply to areas that receive an intermittent supply of water. WASA publishes these schedules to inform customers about the days and times that they can expect to receive a pipe-borne water supply from the utility. Dry season schedules are an important part of WASA's approach to providing a supply to all customers, especially when supply deficits are exacerbated by low rainfall during the dry season.

The RIC is of the view that the requirement should also specify a minimum water supply target to ensure customers are guaranteed to a minimum supply per week as a standard, and should also include a requirement for monitoring the level of supply that customers receive during the dry season (a performance monitoring system). Scheduled minimum supply is particularly beneficial when rationing must occur to ensure a sustainable supply. The performance monitoring system will support WASA's endeavours to adhere to supply schedules for all scheduled customers during the dry season. This system should record information such as the number of customers that received a scheduled supply and the level of the supply they received. The inclusion of a target and performance monitoring regime

will identify service areas where WASA is underperforming and encourage the utility to improve the quality of service to its customers.

Alternatively, it can be argued that the level of supply may not be easily measured by WASA without the installation of additional equipment and appropriate systems. Hence, it may be more practical to require the service provider to report when the published schedules were not adhered to, and the reason for this, without specifying the need for a performance monitoring system.

Do you agree with the amendment of "emergency response programmes" to "contingency programmes"?

Do you agree with the inclusion of a monitoring system for customers on scheduled supply during the dry season? Or should the RIC simply include a requirement for the the service provider to report when the published schedules were not adhered to, and the reason for this, without specifying the need for a performance monitoring system?

3.3. Submission Date of Dry Season Preparedness Plan

This section of the Dry Season Plan Requirements (2007) document specifies the deadline by which WASA must submit the dry season plan to the RIC. It also stipulates requirements for publishing the plan, and making it available to customers. It states:

WASA must:

- *submit a final Plan to the RIC* ***by December 31 of every year****;*
- *publish the Plan on its website;*
- *draw to the attention of customers at least twice during the dry season of the availability of the plan and its salient aspects by publishing in the daily newspapers;*
- *display a copy of the Plan at its offices; and*
- *provide a customer with a copy of the Plan, if requested, at a reasonable charge, if necessary.*

As indicated, the current deadline for WASA to submit its annual dry season plans is 31st **December of each year**. The preparation of the dry season plan just prior to the start of the season allows WASA to use the most current meterological data in its plan[17]. However, because there is no explicit requirement for WASA to submit a draft plan for interrogation by the RIC prior to submission of its final plan, submission of a final plan at such proximity to the start of the season does not allow the RIC enough time to review and provide feedback on the plan. Hence, it does not provide sufficient time for the utility to make adjustments to the plan prior to its implementation. To address these shortcomings, the RIC proposes that WASA submit a draft plan to the RIC several months before the start of the dry season. This is expected to increase the robustness of the final plan. **Therefore, the**

[17] *"How Reliable Are Weather Forecasts?"* National Oceanic and Atmospheric Adminisatration (NOAA), 2018.

RIC is of the view that a draft plan should be submitted by September 1st of every year. The RIC also proposes that the deadline for submitting the final dry season plan be November 1st of every year.

The current requirements specify that WASA publishes the Dry Season Plan on its website, such that the plan is easily accessible to the public. The RIC also requests that WASA publishes the salient aspects of the dry season plan in a daily newspapers, at least twice during the dry season, with updates that show WASA's best endeavours to ensure an equitable supply, and implementation progress of the plan. The dry season plan is typically a large document that is not reader-friendly for the general public. However, a summary would be more concise and thus allow the general public to have a better understanding of the utility's plans for the dry season. The RIC proposes that this requirement be amended to include a public summary[18] within the dry season plan itself, that can be reviewed for publication. Further, the RIC also proposes that all of WASA's social media platforms be utilized to publicise the dry season plan. In addition, the current requirements do not specify a publication deadline. Thus there is no onus on WASA to publish the plan at the start of the dry season, in which case stakeholders may not be able to examine the plan before the start of the dry season. Hence, the RIC proposes a deadline for online publication of the dry season plan of 15th December of each year.

WASA's website can also provide an archive of past plans for a specified length of period. This would allow for more transparency and stakeholder awareness of the various measures taken by WASA to mitigate the impacts of the dry season over the years.

The RIC stipulates that WASA display a copy of the dry season plan at its offices and provide a printed copy, at a set fee, to customers upon request. The purpose of this is to facilitate more modes of access to WASA's plans in addition to the website. The RIC is of the view that this should continue. However, instead of displaying a copy of the plan, the public summary document, along with information on how the public can access a copy of the plan, should be displayed.

[18] Clear and concise, non-technical literature that shows the important topics of work to the public.

Do you agree with the requirement for WASA to provide a draft Dry Season Plan for review before its final submission to the RIC?

Do you agree with adjusting the deadline for submission of the Dry Season Plan to allow for a draft to be submitted by September 1st, and the final plan by November 1st of every year to allow the RIC sufficient time to evaluate the plan?

Do you agree that the requirements should include a deadline for publication of the Dry Season Plans on WASA's website?

3.4. Compliance and Reporting

The "Compliance and Reporting" section of the Dry Season Plan Requirements (2007) document stipulates that WASA must provide reports on the implementation and performance of its dry season plans. This is intended to allow the RIC to evaluate WASA's performance in implementing the plan, as well as to evaluate the effectiveness of the plan, and identify areas where improvements can be made. Therefore, compliance and reporting are critical elements of the requirements.

The current "Compliance and Reporting" requirements states:

- *WASA must use its best endeavours to implement the Plan.*

- *WASA must submit bi-monthly reports on compliance and implementation of the plan.*

- ***By July 30th of each year**, WASA must submit a final report to the RIC on the effectiveness, and its compliance with the implementation of the Plan.*

WASA is required to submit reports on its compliance and implemnation, however, the specific performance data that WASA must furnish was not clearly defined.

The requirement for bi-monthly reports is prudent as it encourages the service provider to be accountable in the implementation of the plan. The reports are also expected to provide feedback on aspects that measure the effectiveness of the various elements of the plan. This type of information can improve future plans.

The submission of a final report to the RIC on the effectiveness and its compliance with the implementation of the plan by 30th July of each year is intended to serve as a post-season review, since at this stage, the dry season would have ended for the given year. It also allows WASA sufficient time to compile information and provide a report to the RIC.

There are two shortcomings in the area of compliance and reporting:

(i) it does not currently include a requirement to provide performance data on projects included in the preceding plan; and

(ii) the requirements do not specifically detail the type of data that the utility should report in the dry season plans. Clear guidelines about the type of performance data to be reported will ensure that the utility provides information that supports proper review and interrogation of the implementation and effectiveness of the plan.

The RIC is of the view that performance data can be used to track progress over the years by facilitating benchmarking against previous years' performance. The requirement for performance data, such as the updated forecast of water resources, demand forecasts, improvements, adherence to supply schedules, the completion status of ongoing projects, and the performance of completed projects, can be included in the reporting requirements.

Hence the RIC is of the view that a performance monitoring system should be included to provide details on the status of ongoing projects from preceding dry season plans and specific performance data.

Do you agree that the requirements should include a performance monitoring system that provides details on the status of projects from preceding dry season plans and specific performance data?

4.0 Specific Proposals to amend the Dry Season Plan Requirements

The dry season plan requirements were developed to assist WASA in providing a sustainable supply by developing and implementing plans to mitigate the issue of water deficits during the dry season. Given the passage of time and the likelihood that dry seasons will become more severe, the RIC has undertaken to review its document and is proposing certain changes to address the shortcoming that have been identified and to improve clarity of the requirements for WASA.

Recommendations

The RIC proposes the following changes to the requirements:

1. The background and context to WASA's preparation of the annual dry season plan should be included to give context to the requiremnts;
2. The dry season plan should be part of a long-term approach to addressing the issues associated with the water supply system. The relationship to a long term strategy should be made clear in the plan;
3. The "emergency response programmes" should be part of a risk management approach. The section would be more appropriately named "contingency programmes";
4. The "communications system and customer information system" should be renamed to "customer communication system" and it should be specified that its purpose is to ensure that WASA has an effective system for communicating information about the dry season to its customers;
5. The requirements should specify a minimum level of water supply to customers during the dry season, and should include a monitoring and reporting requirements on the level of supply that is actually received by customers during the dry season;
6. WASA should submit a draft dry season plan to the RIC by 1st September of each year;
7. The deadline for submission of the final dry season plan should be changed from 31st December to 1st November of each year;

8. The final dry season plan should be published on WASA's website by 15th December of each year; and
9. The dry season plan should include a report on the status of projects from previous dry season plans.