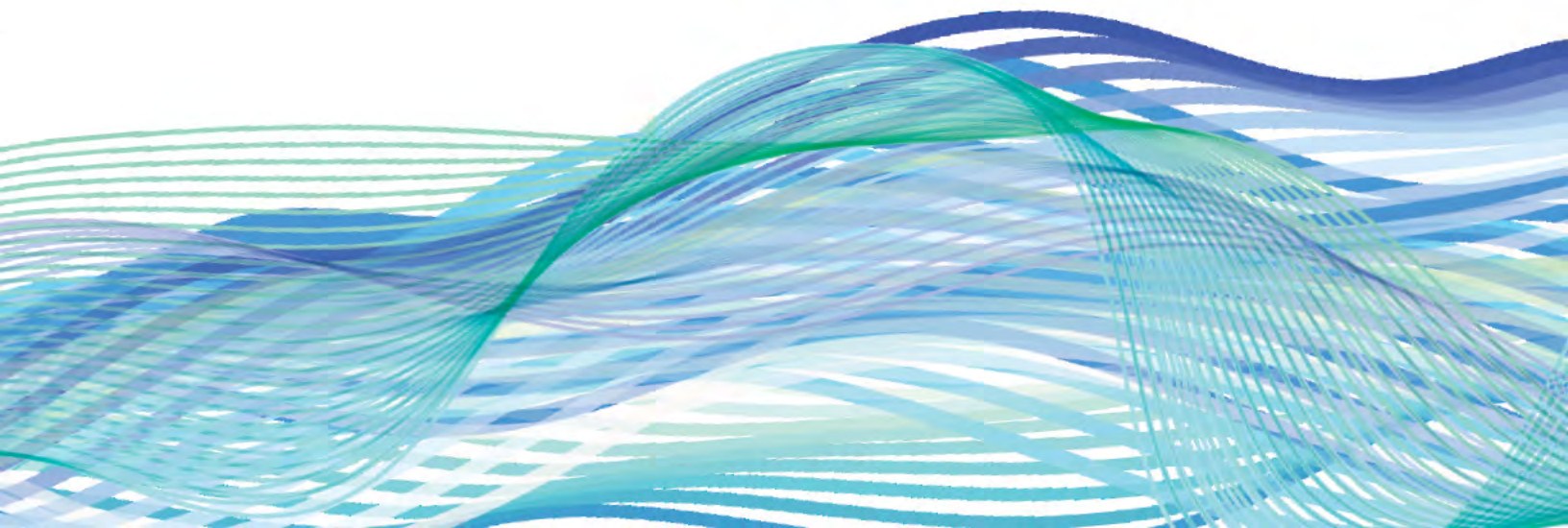




DROUGHT CONTINGENCY PLANNING 2022



Introduction

Prince Edward Island is blessed with a naturally moist environment with approximately 1100 mm of annual precipitation that is fairly well distributed seasonally. Yet, while drought issues are not as prominent as some areas of the country, drought is still a phenomenon that strikes here with some impacts. The source of all freshwater is precipitation and a shortfall eventually makes its way into groundwater and stream flow. Normally, stream flow is a mix of run off and base flow from groundwater discharge. During a drought here, rainfall with runoff is limited and stream flow is made up of declining amounts of baseflow as groundwater table elevations naturally decrease throughout the year. While the impact on stream flow is significant and occurs within weeks of dry conditions occurring, the impact on groundwater levels is less direct. This is in large part because most groundwater recharge occurs during the colder months of spring, followed to a lesser degree in fall and winter. During summer months, the amount of evaporation and plant uptake generally exceeds available precipitation, thus little or no recharge occurs during these periods. Accordingly, droughts during the summer months have little impact on the groundwater table. In addition, the seasonal change in groundwater levels lie within a relatively small range from about a metre to a few metres. This change may have a significant effect on the contribution of groundwater discharge to stream flow but has much less impact on wells that tap aquifer depths of tens of metres to a couple hundred metres. A drought of a period up to a year or more would cause more significant declines in groundwater table elevations. Operations of wells constructed to current standards in Prince Edward Island would continue to provide yields similar to what they would have during normal conditions. However, although most well owners could operate their wells normally, this level of usage would impact aquatic life in streams to a level that they are not normally exposed to. In order to mitigate impacts on aquatic wildlife, reductions of water use from all major water users are needed during extreme drought conditions.

The purpose of drought contingency plans on Prince Edward Island are to reduce usage to partially alleviate drought induced stress on wildlife populations. They will be implemented when an extreme drought as determined by the Canadian Drought Monitor (CDM) occurs where permit holders are sourcing water. Extreme drought as defined by the CDM occurs with a frequency of every 20 years. Lesser droughts occur on a more frequent basis and do not require the implementation of drought contingency plans on Prince Edward Island. The last extreme drought that occurred on the Island was during the summer of 2020. Had they been in place at the time, they would have been required to have been implemented from O'Leary to Charlottetown in August. In addition to the occurrence of extreme drought, should a severe drought exist and the Canadian Drought Outlook (prediction) is for the drought to worsen, drought contingency plans may be required to be implemented. Permit holders will be informed by the Dept. of Environment, Energy and Climate Action (EECA) when this occurs.

¹ The Canadian Drought Monitor is maintained by the Department of Agriculture and Agri-Food Canada and can be viewed at: <https://agriculture.canada.ca/en/agriculture-and-environment/drought-watch-and-agroclimate/canadian-drought-monitor>

The Prince Edward Island Water Act Water Withdrawal Regulations make provisions for the requirement of drought contingency plans to be prepared by applicants for Water Withdrawal Permits. These plans outline the permit holder's procedures to reduce water usage during extreme drought. They will be a requirement when an applicant seeks a permit allocation over 345 m³/day (50 igpm, 9983 m³/month) on average over a month period. Applicants will be informed by the EECA when a drought contingency plan is required as part of their application. Permits will be exempt from the requirement of a plan when they are for:

- purpose of fire protection,
- saltwater wells
- wells located such that they don't intercept groundwater discharging to streams, and
- geothermal wells where the water is returned to the groundwater.

In addition to drought contingency plans, holders of Water Withdrawal Permits to extract surface water are required to halt extraction when the stream level falls below the maintenance flow. This requirement is responsive to current conditions regardless of the recent precipitation conditions and has an immediate and direct benefit for aquatic life. Regardless of whether there is an extreme drought, this requirement must be adhered to. While it is expected that stream flow conditions would be low during extreme drought, it is possible that stream flow may still be above the maintenance flow. In this case, surface water permit holders would still be able to extract water but would have to follow their drought contingency plan.

Components of a Drought Contingency Plan

The following describes items that must be contained in a drought contingency plan. They should be preferably in the order presented here.

PLAN CONTENT SUMMERY

- Water Sources and Usage
- Vulnerability Assessment
- Mitigation Measures
- Drought Status Monitoring
- Drought Response Actions
- Performance Monitoring

Water Sources and Usage

- » This section should describe how water is being used by the permit holder. At a minimum, it should contain:
 - » An overview of the normal activities of the permit holder that utilize water from the permit. For irrigation, provide the crops or plants being irrigated and the general acreage. Provide the location of the activities and indicate the watershed where they are located
 - » A statement indicating how much water is being used and what daily /seasonal patterns there are to the usage
 - » A description of the types of water sources being used
 - Groundwater sources (list permit numbers)
 - Surface water sources (list permit numbers)
 - » An identification of the watersheds where the water sources are located

Vulnerability Assessment

This section is to provide an understanding of the importance of water to the operations of the permit holder and the risks to those operations when water usage must be decreased.

- » Identify risks to operations and or clients of inadequate water supply. Identify those uses that cannot be forgone during extreme drought.
- » Explain how the permit holder's operation would be affected by reduced access to water.
- » Identify minimum amount of water required to avoid unacceptable outcomes.

Mitigation Measures

This section is to provide a summary of any measures the permit holder has undertaken to be more capable of withstanding drought conditions. These are actions that would have been undertaken or are planned prior to a drought conditions as part of normal operations.

- » Provide a description of any changes to operations that have been undertaken so as to make the operations more drought tolerant and resilient
- » Indicate how this would provide benefits to the operations during an extreme drought.

Drought Status Monitoring

This section is to describe plans by the permit holder to monitor for the potential that an extreme drought may be developing and actions they may take in advance of this occurrence.

- » Describe how the permit holder plans to track trends in precipitation conditions. This may include actions such as monitoring the status of the Canadian Drought Monitor for dry and drought conditions that occur in advance of an extreme drought. It may also include tracking precipitation patterns at nearby weather stations.
- » Describe how the permit holder will anticipate that extreme drought may occur. This may include actions such as monitoring the Canadian Drought Outlook.
- » Describe actions that the permit holder may take to make their operations more resilient to extreme drought when it appears that an extreme drought is imminent. This might include actions such as conducting water requiring activities early, putting water into storage or making changes to irrigation patterns, etc.

Drought Response Actions

This section describes the actions that the permit holder will take when an extreme drought occurs. The types of actions will be very different for different permit holders as different activities have considerably different abilities to reduce water usage and impacts on operations varies widely. Permit holders are expected to make significant contributions to reducing their water usage while preserving the core components of their operations. This section needs to contain:

- » Description of all actions that will be undertaken to reduce water usage during extreme drought by both the permit holder and by any clients to whom the permit holder may provide water
- » Provide any details of any coordination that may be done with other permit holders so as to reduce impact on the environment (such as surface water permit holders alternating their pumping regimes so as to not all pump at the same time)
- » Provide estimates of the amount of water savings to be expected with the implementation of the actions indicated.
- » If the permit holder provides water to others, describe communications to clients/public to inform them of:
 - extreme drought conditions present
 - actions that the clients/public must undertake to implement the drought contingency plan

Actions that permit holders or their clients may take to reduce water usage is varied. This is a list of potential activities that a permit holder may wish to consider putting in their drought contingency plan. The list is not intended to be exhaustive but only provide some examples. Any other action that a permit holder could undertake should be considered. Potential activities include:

- Reduce nonessential water use
- Halt grass watering (except newly seeded grass)
- Halt car washing
- Halt street cleaning
- Limit swimming pool filling
- Deficit crop irrigation
- Irrigation during the night
- Increase water reuse
- Temporarily reduce the number of production lines for water intensive processing industries
- Reduce hours for water park and related facilities
- Extract water from alternative sources in a lesser impacted catchment area

Performance Monitoring

When implementing a drought contingency plan, it is important to monitor whether the implementation is achieving the goals of the plan. This section should provide information on:

- » Monitoring of water use to confirm that reductions are occurring as planned
- » Monitoring of activities to be implemented to determine that they are being implemented

Triggering Plan Implementation

The requirement that drought contingency plans must implemented will be determined by EECA. Implementation will be required whenever the Canadian Drought Monitor determines that there is extreme drought in any part of Prince Edward Island. Only permit holders located in the area of extreme drought will be required to implement their plans.

The Canadian Drought Monitor is determined on a monthly basis after the month has occurred. This can leave the determination too late with respect to conditions. Therefore, permit holders may also be required to implement their drought contingency plan if parts of the province are at severe drought conditions, the Canadian Drought Outlook indicates that conditions are expected to worsen (that is degrade to extreme drought) and precipitation levels remain low.

Termination of Drought Conditions

Termination of extreme drought conditions requires that stream flows have risen consistently above the maintenance flow and the Canadian Drought Monitor status is no longer at extreme drought or the Canadian Drought Outlook shows an improving status. No single rain event is likely to reverse extreme drought conditions.

It should be noted that should extreme drought conditions end during the summer well prior to the fall that stream flows may not consistently rise above the maintenance flow until the fall. During this situation, drought contingency plans would be required to be implemented until this occurs. It is important to maintain the plan actions until then as low stream baseflow levels would cause impacts on aquatic life to remain high even though drought conditions on the land may have ended.

The decision that extreme drought conditions have ended and drought contingency plan implementation can cease will be made by EECA. This will be communicated to permit holders on a priority basis once the decision has been made.

Approval and Renewal of a Drought Contingency Plan

Drought Contingency Plans are requirements of some applications for Water Withdrawal Permits. Applicants will be informed by EECA if they are required to submit a drought contingency plan. Plans will be approved by the EECA. They will normally have a application period of five years to match the term of the Water Withdrawal Permit which they are connected to. They will be required to be updated and resubmitted during the renewal process for the Water Withdrawal Permit. Should their operations change, permit holders may submit a revised drought contingency plan at any time for consideration and approval by EECA.

Appendix - Fillable Template

Drought Contingency Plan

[watershed name]

Submission Information

Permit Applicant:

Plan Commencement Date:

Water Sources and Usage

Vulnerability Assessment

Mitigation Measures

Drought Status Monitoring

Drought Response Actions

Performance Monitoring

Submission and Approval

Submitted by:

Signature

Name (printed)

Date

Dept. of Environment, Energy and Climate Action Approval by:

Signature

Name (printed)

Position

Date



Drought Contingency Planning

A DOCUMENT FOR REVIEW,
COMMENT AND DISCUSSION

Fall 2021