



Being Prepared for Water Shortage

A guidance document for Municipalities

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Being Prepared for Water Shortage - A guidance document for Municipalities | Environment and Protected Areas

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Being Prepared for Water Shortage

Introduction

Municipalities must be prepared to consistently deliver safe and secure water resources to users during water shortages.

A **Water Shortage Plan (WSP)** helps prepare a community to have a safe and reliable supply of water throughout any duration of water shortage. Water shortages may be caused by drought, low water levels, or short-term disruptions to water lines and infrastructure.

A WSP assists municipalities to prepare and respond efficiently, no matter how the water shortage is caused, and can be scaled up or down depending on the severity. Your plan should:

- assess the risks of water shortages,
- outline options to respond to water shortage, and
- establish a plan for implementation, including trigger criteria and a monitoring program.

Some municipalities may need to work with a qualified water supply specialist such as a hydrology consultant to develop a water shortage plan.

Purpose

This document guides development of a municipal WSP, or updates to existing plans. It could also be used by any community or group that depends on the consistent delivery of water, including Indigenous communities, water co-ops, regional water lines and industry. This guide contains sections which municipalities may consider including in their WSP, but it is not intended to provide legal advice or fulfill a licence requirement.

The Government of Alberta (GoA) recommends all municipalities in Alberta have a WSP or a similar document. The GoA does not review or approve these plans. They are for municipal governments' planning purposes and should be developed with your community's specific needs and water supply in mind. However, GoA staff are available to review your plan to make recommendations, if requested. Contact information to regional offices is provided at the end of this document.

Other water planning documents

In addition to a WSP, many municipalities may have a water conservation plan. These are long term plans which outline how to reduce water demand and increase water use productivity. Together, these plans include actions taken by a municipality to improve the water works system by increasing efficiency and decreasing loss, while managing demand and customer usage. These plans should reduce the frequency and duration of extreme water shortage, and help municipalities respond to water shortages if they happen.

Some communities may also have a source water protection plan, however those plans are usually focused on protecting, maintaining or improving water quality and quantity.

Water shortage Response Plans (WSRPs)

Some municipal water licences (in basins with an Approved Water Management Plan) require the development of a Water Shortage Response Plan as a condition of their licence. While these two documents have overlap, they are not the same.

If you are required to complete a WSRP as a condition of your water licence, please work with your regional water approvals staff. Additional resources related to "Preparing Water Shortage Response Plans" are available on [Open.Alberta.ca/publications](https://open.alberta.ca/publications).

Planning, implementing, and evaluation

Water Shortage Plans are living documents and should be updated regularly with new information. The following steps should be considered in developing a WSP:

1. System Assessment: Conduct a detailed assessment of the water supply system.
2. Triggers and Response Stages: Define specific trigger points based on key indicators.
3. Response Measures: Outline response measures to be implemented at each response stage.
4. Emergency Preparedness: Prepare contingency plans for supply interruptions in drought conditions.
5. Monitoring and Evaluation: Establish procedures for monitoring water supply conditions.
6. Communication Strategy: Develop an outline and educational resources.
7. Plan Implementation: Track your response actions and evaluate to update your plan as required.

These sections are further described in the Water Shortage Plan Template.

Water Shortage Plan Template

The following information outlines what a municipality may want to include in their Water Shortage Plan. The short descriptions are followed by bullet points of what could be considered within sections of a plan but will need to be adjusted based on the municipality's local context.

Background and information

Introduce the purpose of the plan and outline strategies for managing water shortage. Provide a brief overview of the water supply system, including its infrastructure, service area and water licensing. Highlight the importance of water conservation and preparedness in ensuring reliable and resilient water supplies.

Key considerations:

- Purpose of the plan.
- Overview of the water works system and source of supply.
- Water licence information.



Need help finding water supply trends? Visit Rivers.Alberta.ca to download all historical data at available monitoring stations. If that is not available, or you need extra assistance, contact your regional office.

System assessment

Conduct an assessment of your current water works system, including an inventory of additional nearby water sources (e.g., raw water reservoirs, irrigation canals, wells, etc.). Evaluate the vulnerability of these sources to drought conditions. Analyze historical source water supply data and trends to identify potential patterns and challenges.

Key considerations:

- Description of water source(s) such as intake drawings, intake depths, type of intake etc.
- Vulnerability assessment for drought conditions and other factors such as historical operating levels in rivers, tributaries, lakes, reservoirs etc.
- Historical source water supply data and trends.*



Drought and low water conditions may also impact water quality. For example, reservoirs or other surface water may have increased algae blooms during warm and dry years. Water treatment operations should be prepared to increase treatment as required.

- Water works system usage records (minimum five years), not limited to:
 - peak spring, summer, fall, winter demand
 - commercial
 - residential
 - irrigation
 - bulk water fill station
 - non-revenue water (system leakage)
- Water licensing information:
 - water licence data (including their priority number, any water diversion restrictions, such as water management thresholds.
 - Water management thresholds may include minimum flows, Instream Objectives [IOs], Water Conservation Objectives [WCOs] etc.)

Triggers and response stages

Define specific trigger points for response actions corresponding with the risk and severity of the potential shortage and an associated response stage. Triggers may be based on indicators such as raw water reservoir levels, precipitation forecasts, and water demand (spring, summer, fall, and winter). Establish clear criteria that explain how you would move between response stages including escalation and de-escalation.

Key considerations:

- Identify trigger points to initiate response stages. Examples include:
 - raw water reservoir volumes and reserves
 - source water conditions (levels, flows: projected or observed)
 - provincial water shortage management stages*
 - extended weather forecast
 - source water quality (alga bloom, elevated turbidity, temperatures etc.)
- Define response stages. Stages may include:
 - Normal: no additional action. Regular monitoring.
 - Watch: precipitation has been lower than usual or upstream changes are expected. Initiate voluntary water conservation measures.
 - Warning: water conservation ensures water sources remain in a “normal” range and influences an individual's and/or community behaviors.
 - Critical: community-wide water conservation is required to maintain water availability and may need to be enforced by bylaw officials.
 - Emergency: urgent action is required to ensure adequate water for human health and safety or critical ecological ecosystems
- Conditions for transitioning between stages (both increase and decreasing).

*The GoA has its own Drought and Water Shortage plan which includes a five-stage response intended to guide river basin and provincial scale responses. These stages can be handy reference points, but are not necessarily the same as what will be included to a municipalities WSP.

Response measures

Outline a sequence of response measures to be implemented at each stage. Include both proactive measures to reduce water demand (e.g., public education, leak detection and infrastructure repair programs) and response measures (e.g., water use restrictions, emergency water supply options.).

Key considerations:

- Describe actions to be taken at each response stage. Examples include:
 - Voluntary water conservation measures

- Mandatory water conservation measures, such as:
 - watering only during certain times of the day (irrigation)
 - watering only with hand-held hose or containers
 - watering only with recycled water (municipal water used from hydrant for flushing maintenance or system repairs)
- Implementation of water use restrictions, such as:
 - limit new landscaping or irrigation projects
- Initiate emergency source water supply (if applicable).
- Communication and outreach strategies.

Legal and regulatory compliance

Response measures may have legal or regulatory requirements that must be fulfilled before or during implementation, including regulatory requirements under EPA legislation. Ensure the water shortage plan assesses and describes the regulatory requirements for certain response actions and confirms how those requirements have or will be fulfilled. For example, include what authorizations are required for water use alternatives under the *Water Act* (e.g., temporary pumping, temporary diversion licences, access to water ways.). Document any authorizations required for emergency actions and establish protocols for obtaining them in a timely manner.

- Comply with regulatory requirements (e.g. for access to water ways, temporary pumps, temporary diversion licences).
- Create draft application documents for authorizations required for emergency actions.

During drought, there may be expediated processes or other supports to help your municipality quickly gain regulatory approval. In 2024, the GoA developed expediated processes to help all water users access water in times of water shortage. Those factsheets can be found on open.alberta.ca/publications by searching “2024 drought support”.

Contingency planning

Prepare contingency plans for extreme scenarios. Examples of this information include:

- Knowing how long available water storage will last for your municipality.
- Identifying alternative water supply sources, emergency response protocols, and coordination procedures with internal and external organizations.
- Conducting regular training exercises and drills to ensure that staff are prepared to respond effectively to a severe shortage.

Key considerations:

- Develop a contingency plan for extreme drought or water shortage conditions and identify alternative methods to augment supply. Examples include:
 - Utilize reservoirs to manage system demands while water source is impacted.
 - Pumping from an alternate source.
 - Develop new or additional water supplies.
 - Assess alternative water supplies, such as recycled water or stormwater for non-consumptive uses such as irrigation, green space watering or landscaping.
- During extreme shortage, new water supplies may be the only solution (temporary pipelines, importing water (trucking), ground water wells, groundwater under direct influence of surface water wells).
- Demonstrate enhanced water conservation which may have undesirable impacts to some areas of the community. Examples include:
 - Cease irrigation (i.e., parks, boulevards, cemeteries).
 - Temporary closure of water or spray parks;
 - Close or limit the filling of indoor and outdoor pools;
 - Restrict some business operations with high visibility water use such as car washes;
 - Implement emergency leak detection and system repairs;
 - Reduce system maintenance where applicable (e.g., hydrant flushing, boulevard cleaning, dust control).

- Coordination with internal and external organizations.
 - Internal: Parks department, Operations, Infrastructure,
 - External:
 - GoA; Municipal Affairs, Environment and Protected Areas, Public Safety and Emergency Services
 - Local police and emergency medical services
 - Upstream and downstream communities
- Training for staff
 - Incident Command System (ICS) training for responses that will be structured in an ICS format. This will provide a baseline of understanding of the ICS structure, roles, and core principles.
 - ICS 100 course for all personnel assuming any position within an ICS structured response delivery.
 - ICS 200 for personnel who are likely to assume a supervisory position within an ICS structured response.
 - Additional ICS training (ICS 300, 400 or position specific courses) for personnel assuming command staff or possibly covering multiple roles in an ICS structured response.
 - Information on ICS training can be found at: www.Alberta.ca/incident-command-system-courses.
 - This contingency plan is intended to complement and not replace any existing Emergency Response Plan (ERP) or Standard Operating Procedures (SOP) authorized under your *Environmental Protection and Enhancement Act* (EPEA) registration or approval.

Monitoring and evaluation

Establish procedures and designate staff for monitoring water supply conditions, including the use of real-time data monitoring systems, in-person/visual infrastructure checks, and regular assessments of water demand patterns. Define specific criteria for evaluating the effectiveness of response measures and identify opportunities for continuous improvement.

Key considerations:

- Stay informed and up to date on provincial information related to drought. Use Rivers.Alberta.ca to see near-real-time data, water shortage advisories, snowpack and river conditions, reservoir data, forecast details and more.
- Create procedures for monitoring source water conditions (levels, flows etc.)
- Create procedures for monitoring system demands vs available supply.
- Evaluation criteria for assessing the effectiveness of response measures (water reduction daily values).

Need additional funding to protect or improve natural infrastructure or drought resilience? Check with the Government of Alberta for grant programs, such as:

- Watershed Resiliency and Restoration Program: Improve flood and drought resiliency through conservation, restoration and enhancement of Alberta's watersheds.
- Wetland Replacement Program: Re-establish wetland ecology by providing resources for collaborative wetland restoration or construction projects across the province.
- Drought and Flood Protection Program: Supports municipalities and Indigenous communities to improve their long-term resilience to drought and flood events.

See these and other funding opportunities at: <https://www.alberta.ca/environmental-stewardship-funding-opportunities>

Communication and outreach

Develop a communication strategy outline to inform and engage residents, businesses, and other stakeholders about the water shortage and the actions that will be being taken to address it. The strategy should be refreshed at the onset of a water shortage. Plan to utilize a mixture of communication channels, including but not limited to websites, social media, newsletters, public service announcements, electronic billboards and public meetings. Take stock of what educational resources already exist, and what may need to be created or refreshed.



An important resource for any municipality working on water shortages or any watershed management topic are their local Watershed Planning and Advisory Council (WPAC). Your local WPAC may be able to help you develop education and outreach resources, collaborate with other stakeholders, or find data and monitoring resources. See the resources section for more information.

Key Considerations:

- Identify your communication objectives (raise awareness, change opinions, influence actions).
- Align communication stages with response plan stages.
- Be clear about actions are voluntary or mandatory, as well as incentives or penalties.
- Utilize a variety of communication channels (e.g., website, traditional and social media, public meetings).
- Develop new or use existing educational materials and resources to promote water conservation.
- When applicable, work with neighboring communities to provide consistent, coordinated messaging. Develop possible messages in advance and update them as an event develops.

Plan implementation

Clarify the responsibilities of water system owners, operators, and stakeholders in implementing the plan. Establish a timeline for plan implementation and ongoing management, including regular updates and revisions as needed.

Key considerations:

- Responsibilities of system owners, operators, and stakeholders.*
- Timeline for plan implementation and ongoing management.
- Plan evaluation metrics and after-action reviews.
- Timeline for plan review and updates.

*Limit the extent that the plan relies on external stakeholders. If required, ensure those stakeholders are involved in the creation of the plan and are engaged early and often during implementation.

Supporting documentation

Include supporting documents, data sources, and references that provide additional context and detail for the plan. This may include maps of water supply infrastructure, contact information for key personnel, and technical reports or studies.

- Documentation of permits and approvals required for emergency actions.
- Supporting documents, water usage data (minimum 5 year).
- *Water Act* Licence, and operating conditions (WCO, IO, Flow rates etc).
- Maps and source water intake/ reservoir drawings.

Conclusion

A Water Shortage Plan should be reviewed annually in areas prone to drought, or every few years in areas with a more secure water supply. The completed plan can be shared publicly or kept internal. However, it should be sent directly to any key stakeholders.

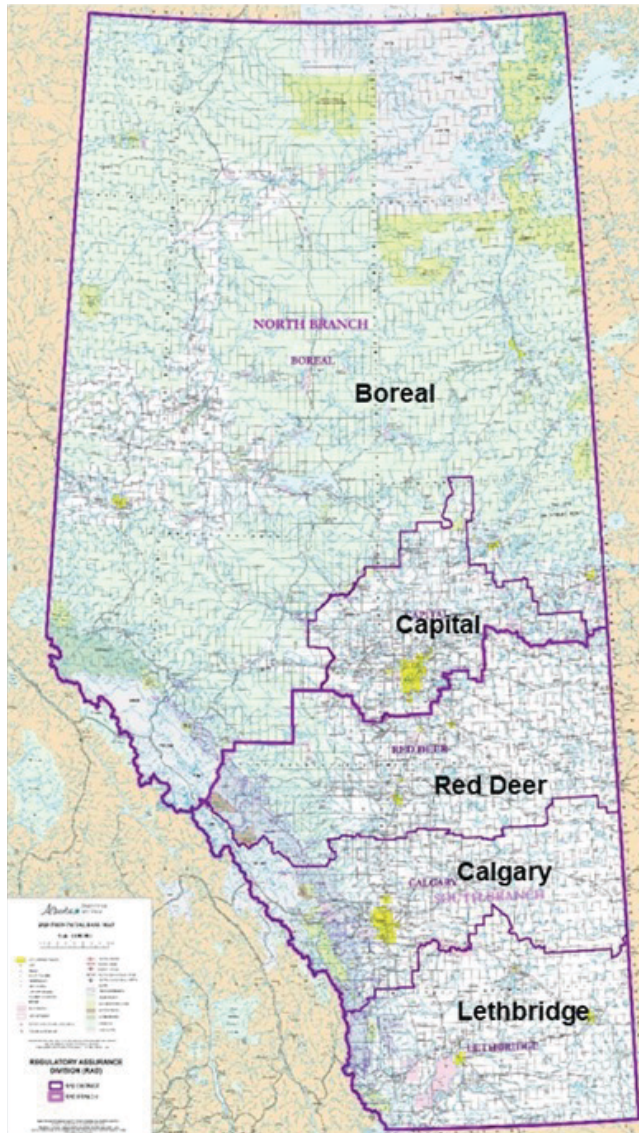
A water shortage plan is an excellent investment in protecting your community. Having a well-thought-out plan with guidance to suit a variety of challenges will help the community build internal resilience and respond to any water shortages more quickly and efficiently, saving time and money.

Contact information

For assistance on your water shortage plan please contact your Environment and Protected Areas district office:

Boreal District	epa.waborealregion@gov.ab.ca 780-538-5260
Capital District	epa.wacapitalregion@gov.ab.ca 780-427-7617
Red Deer District	waterapprovals.reddeer@gov.ab.ca 403-340-7052
Calgary District	epa.waapprovcal@gov.ab.ca 403-297-7602
Lethbridge District	waterapprovals.lethbridge@gov.ab.ca 403-381-5322

EPA district office boundary map



Resources

Monitoring

Alberta River Basins

GIS-based resource with near-real time advisories, snowpack and river conditions, reservoir data and forecast details.

<https://rivers.alberta.ca/>

Or as an App. Search: Alberta Rivers

AFETUW

Alberta Flow Estimation Tool for Ungauged Watersheds. This online tool allows for the estimation of ungauged flows, and has a search tool for surface water and groundwater license information.

<https://afetuw.alberta.ca/>

Drought Resources

EPA Drought Webpage

General information and links related to drought and water shortage, including regulatory considerations under the *Water Act*.

<https://www.alberta.ca/drought.aspx>

Water Shortage Preparedness

Factsheet: to support households which rely on municipal water supply for potential water shortage.

<https://open.alberta.ca/publications/water-shortage-preparedness>

Water Act and Regulatory

Alberta's Water Priority System

Fact sheet: Explains Alberta's water priority system, which is based on seniority.

open.alberta.ca/publications/albertas-water-priority-system-tools-for-water-licence-holders

Water Management Thresholds

Fact sheet: Explains water management thresholds including water conservation objectives and instream objectives.

open.alberta.ca/publications/water-management-thresholds

EPA Water Legislation and Guidelines

Webpage: Acts, regulations and guidelines governing management and protection of Alberta's Water.

<https://www.alberta.ca/water-legislation-and-guidelines.aspx>

Preparing Water Shortage Response Plans

Guide: For municipalities in closed basins (where no new licences are being given) to meet licence requirements.

<https://open.alberta.ca/publications/preparing-water-shortage-response-plans>

Water Shortage Management Stages

Fact sheet: defines the five stages of water management and the potential management actions in each of those stages.

open.alberta.ca/publications/water-shortage-management-stages

Ministerial Order for Stormwater Use

Fact sheet: Changes to the Water (Ministerial) Regulation exempt stormwater diversions of up to 6,250 cubic metres per year from requiring a *Water Act* licence, if certain conditions are met.

<https://open.alberta.ca/publications/stormwater-use-regulation-amendment-removing-barriers>

Agriculture

AGI Farming in Dry Conditions Webpage

Webpage: Information and tools to assist farmers during dry conditions.

<https://www.alberta.ca/farming-in-dry-conditions.aspx>

EPA Temporary Livestock Water Assistance

Fact sheet: Information for applying to Temporary Livestock Water Assistance Program.

<https://open.alberta.ca/publications/drought-support-temporary-livestock-water-assistance>

Grants and Funding

GoA Funding Opportunities

Environmental stewardship and sustainability – Funding opportunities.

<https://www.alberta.ca/environmental-stewardship-funding-opportunities>

Watershed Resiliency and Restoration Program

Improve flood and drought resiliency through conservation, restoration and enhancement of Alberta's watersheds.

<https://www.alberta.ca/watershed-resiliency-and-restoration-program>

Drought and Flood Protection Program

Supports municipalities and Indigenous communities to improve their long-term resilience to drought and flood events.

<https://www.alberta.ca/drought-and-flood-protection-program>

Municipal Resources

Alberta Municipalities

Drought Preparation Webpage:

<https://www.abmunis.ca/advocacy-resources/environment/drought-preparations>,

Water Conservation Webpage:

<https://www.abmunis.ca/advocacy-resources/environment/water-management/water-conservation>

City of Grand Prairie

Drought Contingency/Emergency Water Use Plan

Webpage: <https://www.gptx.org/Departments/Water-Service/Current-Water-Restrictions>

Plan: <https://www.gptx.org/files/sharedassets/public/v/2/departments/water-service/documents/drought-contingency-plan.pdf>

City of Calgary

<https://www.calgary.ca/water/programs/water-efficiency-strategy.html#plan>

City of Medicine Hat

<https://www.medicinehat.ca/en/home-property-and-utilities/water-conservation.aspx>

City of Camrose

Water Shortage Response Plan:

<https://www.abmunis.ca/system/files/2024-04/Camrose%20Water%20Shortage%20Plan.pdf>

Additional Resources

American Water Works Association

M60 Drought Preparedness and Response (2019)

ISBN: 9781625763334.

<https://engage.awwa.org/PersonifyEbusiness/Bookstore/Product-Details/productId/75759388>

Alberta Water Council

Building Resilience to Multi-year Drought: Guidebook

<https://www.awchome.ca/projects/building-resiliency-multi-year-drought-6/>

Water Conservation, Efficiency and Productivity Plans

<https://www.awchome.ca/projects/water-conservation-efficiency-productivity-1/>

Watershed Planning and Advisory Councils (WPACs)

Information about and hyperlinks to all 11 WPACs in Alberta.

<https://www.alberta.ca/watershed-planning-and-advisory-councils>

North Saskatchewan Watershed Alliance

How Municipalities Prepare for Water Shortage blog:

<https://www.nswa.ab.ca/2024/03/28/action-adaptation-how-albertas-municipalities-plan-for-water-shortages/>

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