

# Building Resiliency to Multi-Year Drought in Alberta:

Tools for Small Urban and Rural Municipalities

Companion Report  
January 2021



## About the Alberta Water Council

The Alberta Water Council (AWC) is a collaborative partnership that provides leadership, expertise, and sector knowledge and perspectives to help governments, Indigenous Peoples, industry, and non-governmental organizations to advance the outcomes of *Water for Life*. It advises the Government of Alberta (GoA) on matters pertaining to the successful achievement of the outcomes of the *Water for Life* strategy and on effective water resources management policies, practices, and tools.

The AWC regularly reviews the implementation progress of the *Water for Life* strategy and champions the achievement of the strategy's goals. The Alberta Water Council also advises the Government of Alberta, stakeholders, and the public on effective water-management practices, solutions to water issues, and priorities for water research. The AWC may advise on government policy and legislation in some instances. However, the Government of Alberta remains accountable for the implementation of the *Water for Life* Strategy and continues to administer water and watershed management activities throughout the province.

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## List of Acronyms

AEMA	Alberta Emergency Management Agency
AER	Alberta Energy Regulator
AEP	Alberta Environment and Parks
AAF	Alberta Agriculture and Forestry
ALMS	Alberta Lake Management Society
AUMA	Alberta Urban Municipalities Association
AWC	Alberta Water Council
ALUS	ALUS Canada
BMP	Best Management Practice
BRWA	Battle River Watershed Alliance
CAPP	Canadian Association of Petroleum Producers
CEP	Water Conservation, Efficiency, and Productivity
DUC	Ducks Unlimited Canada
GoA	Government of Alberta
IFN	Instream Flow Need
IO	Instream Objective
LUF	Land-Use Framework
NGO	Non-Governmental Organization
PFRA	Prairie Farm Rehabilitation Administration
RMA	Rural Municipalities of Alberta
SOLE	State of Local Emergency
SWAD	Surface Water Allocation Directive
ToR	Terms of Reference
TUC	Trout Unlimited Canada
WCO	Water Conservation Objective
WPAC	Watershed Planning and Advisory Council
WSG	Watershed Stewardship Group
WSRP	Water Shortage Response Plan

## Executive Summary

Work on the Building Resiliency to Multi-Year Drought Project began in 2018 following the AWC's approval of the project terms of reference. The team completed a literature review and conducted targeted interviews to inform the draft *Building Resiliency to Multi-Year Drought Guide* and then tested the guide and supporting documents in a pilot workshop hosted by the Battle River Watershed Alliance. Participants provided feedback on the workshop delivery, the supporting materials, and the guide itself, which was incorporated into the project deliverables before review and approval by the AWC Board.

The AWC recommends the following performance measure, to be evaluated one year after public release of the project deliverables:

- Percentage of WPACs that have held drought resiliency workshops using the *Building Resiliency to Multi-Year Drought Guide* 18 months after the report and supporting materials are publicly released.

The AWC made one recommendation, related to updating the guide:

- The AWC recommends that a WPAC be tasked with reviewing the guide and updating the web addresses as needed.

# 1.0 Introduction

Multi-year droughts are recurrent events throughout Alberta's history, with significant impacts to our environment, economy, and society. A drought can be described as a prolonged period of abnormally dry weather that depletes water resources.<sup>1</sup> Depleted water resources may include natural sources (e.g., rivers, streams, lakes, groundwater) as well as human-made storage (e.g., reservoirs, dugouts). Drought management at the municipal and community level considers the impacts of depleted water resources on environmental, economic, and social needs and expectations. The risks and impacts associated with multi-year droughts are greater, requiring advanced and ongoing preparation.

## 1.1 Importance of Multi-Year Drought Resiliency

Multi-year droughts are especially damaging because their impacts on the environment, the economy, and society are cumulative. Natural systems may take decades or centuries to recover,<sup>2</sup> and socio-economic and health effects are also long-lasting. While even single-year droughts can have significant ecological and economic impacts, multi-year droughts often have more pervasive consequences that extend to many sectors.

Alberta was among the hardest hit provinces in the 2001 – 2002 drought, one of Canada's most expensive natural disasters. There were impacts to multiple sectors,<sup>3</sup> ranging from agriculture to recreation, tourism, health, hydroelectricity, transportation, and forestry. In its 2018 *Climate Change Vulnerability and Risk Assessment*, the City of Edmonton identified drought as one of the top four climate hazards with the biggest direct physical health effects, including stress, anxiety, and depression, as well as food-borne and water-borne disease.

In a multi-year drought, the environmental, economic, and social effects are multiplied every year by management decisions made during previous years. Because we do not know in advance whether a drought will become a multi-year event, these prolonged droughts require even greater preparedness and resiliency.

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1 Canadian Disaster Database. Available online: <https://www.publicsafety.gc.ca/cnt/rsrscs/cndn-dsstr-dtbs/rfrnc-tbl-smbls-dfntns-en.aspx>. Accessed February 20, 2018.

2 Adapted from the Canadian Disaster Database.

3 Agriculture and Agri-Food Canada. Lessons Learned from the Canadian Drought Years 2001 and 2002. Available online: <http://www.agr.gc.ca/eng/programs-and-services/list-of-programs-and-services/drought-watch/managing-agroclimate-risk/lessons-learned-from-the-canadian-drought-years-2001-and-2002/?id=1463593613430>. Accessed January 31, 2018.

## 1.2 About This Project

This project was brought to the Alberta Water Council (AWC) by Watershed Planning and Advisory Councils (WPACs) to facilitate the delivery of customizable information by WPACs to support municipalities and communities across the province in building resiliency to multi-year drought.

In 2018, the AWC approved terms of reference (Appendix A) for a project team to assist WPACs as they engage municipalities and communities within their watershed to better plan for, mitigate, respond to, and recover from multi-year droughts. Representatives from governments, non-government organizations, and industry participated on the team (Appendix B). The project's objectives were to:

1. Highlight the importance of multi-year drought management in Alberta by documenting lessons learned from previous droughts and expected changes due to climate change.
2. Compile existing drought management information and resources in Alberta and case studies from selected jurisdictions.
3. Increase awareness of federal, provincial, and municipal water management roles, responsibilities, and regulations relevant to drought.
4. Provide guidance on management objectives, potential risk and impacts, triggers, and suggested actions for small urban and rural municipalities before, during, and after a drought.
5. Produce a guide and workshop materials to support WPACs in engaging small urban and rural municipalities.

## 1.3 Purpose of This Companion Document

This work supplements the *Building Resiliency to Multi-Year Drought Guide* and provides information on how and why the guide and supplementary material were developed. It also provides information on the pilot workshop held with a WPAC and municipal and water-user participants to test the materials and obtain feedback to improve the project deliverables. Lastly, it includes recommendations for performance evaluation and lessons learned through the project.

## 2.0 Methodology

Work on this project began in 2018 with a literature review and targeted interviews to compile historical examples of multi-year droughts in Alberta, lessons learned, and expected changes due to climate change. Sections of the *Building Resiliency to Multi-Year Drought Guide* were then drafted and, along with other supporting materials, tested in a workshop setting with a WPAC and municipal representatives. Feedback from the workshop participants was incorporated into the project deliverables.

### 2.1 Targeted Interviews

The project team conducted targeted interviews with individuals from the Government of Alberta, municipalities, irrigation districts, and others to “build the case” for multi-year drought management by illustrating historical examples of multi-year droughts in Alberta and lessons learned from them. The interviewees also identified key tools, strategies, and examples that are summarized in Section 5.0.

The interview results were incorporated into the *Building Resiliency to Multi-Year Drought Guide*. An interview report was also developed which includes information on the interviewees and aggregated responses on historical droughts, their impacts, and strategies used to adapt to and cope with multi-year droughts. This interview report is included as an appendix in the guide.

### 2.2 Literature Review

The team compiled existing drought management resources and information from selected jurisdictions through a literature review. The information was compiled into a case studies report, found in the appendix of the *Building Resiliency to Multi-Year Drought Guide*.

The jurisdictions selected for the literature review were based on their experience with drought, geographic similarity to Alberta, and governance structure. The topics researched included cost, successful outcomes and best practices, education and communication, collaboration and drought networks, and water allocation.

In addition to the case studies report in the guide’s appendices, many of the case studies are presented within the guide as examples of best practices, tools, and strategies in action.



## 2.3 Education and Outreach Task Team

An Education and Outreach Task Team was established to assist in the development of workshop materials. The team members were asked to join because of their communications and engagement experience; a list of the membership is found in Appendix B.

Following the development of the initial draft of the guide, the project team sought input from the task team on effective communication tools and strategies to use during a workshop where WPACs would communicate the information in the guide to representatives from municipalities, industry, and other water users within the watershed. The task team provided direction on the draft report, the workshop structure, and desired outcomes. They also provided suggestions for materials that would support the WPACs in delivering the guide's information.

The workshop materials developed were as follows:

- Workshop Agenda — a suggested workshop agenda that can be modified by the WPACs as desired.
- PowerPoint Presentation — a presentation that outlines the modules of the guide and the theme areas while being customizable to allow WPACs to add information on drought in their region and to focus on the themes most relevant to them.
- Factsheets — quick reference guides for each of the theme areas that identify the rationale for the theme, the phase of drought when it is relevant, the strategies included, and some of the tools and resources available.
- Roles and Responsibilities — quick reference guide for participants to review who is responsible for what during a drought. The handout provides space for participants to identify specific people relevant to their watershed's needs.
- Worksheets — worksheet packages for participants to identify their watershed's needs in breakout groups. The worksheets are focused on either before, during, or after a drought and include prompts for participants to identify relevant themes, strategies, resources, stakeholders, and potential costs.

Instructions to access these workshop materials are found in Appendix C.

The Education and Outreach Task Team discussed supporting tools and documentation that would allow participants to effectively use the large amount of information presented in the guide. One widely supported suggestion that was not implemented because of budget and timeline implications was the development of an online tool. This tool would have allowed municipal representatives to access the information from the guide in an interactive format and build a drought management plan based on those themes and strategies most relevant to their needs.

Key considerations for development of an online tool were the costs for development and web hosting.

## 2.4 Pilot Workshop

The draft guide and associated workshop materials were tested in a pilot workshop with the [Battle River Watershed Alliance \(BRWA\)](#) and representatives from municipalities within the region. The workshop summary notes are found in Appendix D.

During the workshop, the participants, including the BRWA staff, were asked to provide feedback on the workshop structure, its delivery, the supporting materials, and the draft guide. Following the workshop, a survey was sent to the participants for further feedback. The feedback received was consolidated into a document found in Appendix E.

The project team reviewed the feedback and incorporated it into the draft guide and workshop materials.

## 3.0 Performance Evaluation and Review

The AWC recommends the following performance measure to assist in evaluation and review of the success of the project:

Percentage of WPACs that have held drought resiliency workshops using the *Building Resiliency to Multi-Year Drought Guide* 18 months after the report and supporting materials are publicly released.

Success for this performance measure is defined as 75% of WPACs having held a workshop. If assessment of the performance measure indicates that less than 75% of WPACs have held workshops, AWC staff should contact WPACs to identify the barriers and obstacles that have prevented them from doing so.

For WPACs that did host workshops, additional information on the proceedings will help both the AWC evaluate the effectiveness of the project and the WPACs to share any lessons learned. Follow-up questions on the workshops can include the following:

- How many participants attended and who did they represent?
- Did the participants provide any feedback on the guide or workshop?
- Did the workshop increase awareness of the need for improving drought resilience?
- Have any of the participants begun work on drought resiliency plans for their communities?

A template survey been provided in Appendix F to assist in obtaining information from participants.

## 4.0 Updating the Guide

The guide contains many online resources and tools and includes both hyperlinks in the guide text and written web addresses in the footnotes for each. For websites where hyperlinks are not appropriate, instructions are provided to allow users to find the information referenced in the guide. These hyperlinks and web addresses were correct at the time the project team completed their work, but many web addresses change over time as organizations are restructured or renamed, or reports are archived.

The AWC recommends that a WPAC review the guide and update the web addresses as needed. Updated versions of the guide should be shared with the AWC for posting on the AWC website.

## 5.0 Keys to Success

Through completion of the *Building Resiliency to Multi-Year Drought Guide* and participating in the pilot workshop, the project team identified areas where advice can be provided to WPACs preparing to hold their own workshops with the guide and workshop materials developed through this project. These areas are outlined below:

### Priority Themes and Strategies

The *Building Resiliency to Multi-Year Drought Guide* contains a large amount of information separated into themes and strategies. If there are priority issues in a watershed, it may be helpful to give a broad overview of the themes and then focus on those priority concerns.

Identification of the priority themes can be accomplished through a pre-workshop survey. A template has been provided in Appendix F.

### Pre-Workshop Materials

In addition to gathering information through a survey before a workshop, WPACs may find it helpful to distribute a binder of materials to workshop participants well in advance of the workshop date. Because of the large amount of information in the guide, participants may require significant preparation time. Hard copies of key materials, such as the guide and factsheets, may help with preparation.

### Breakout Group Approach

The pilot workshop used a breakout group session based on phases of drought (before, during, and after). The intent was to focus participants on the themes and strategies most relevant to their municipalities preparing for, experiencing, and recovering from drought. Feedback received from participants was that there was insufficient time to fully explore each theme, and they would have benefitted from a more focused discussion.

If priority themes have been identified by participants before the workshop, the hosting WPAC may wish to consider a breakout group session based on theme, rather than phase of drought. For example, if five priority themes have been identified, five breakout groups can be established, and each group can discuss the needs of their municipalities relevant to that theme in all phases of drought.

## **Watershed Specific Information**

Participants may find it helpful to receive information on their watershed, such as geography, land use (e.g., cropland, pastures), annual average flows, water licensees and water licence volumes, population (municipalities, Indigenous communities), and other considerations specific to the watershed. Not all participants will be aware of this information, and it will provide valuable context for discussions on drought planning.

## **Post-Workshop Follow-Up**

As referenced in Section 3.0, a post-workshop follow-up survey may be useful to determine the effectiveness of the workshop. A template has been provided and should be delivered to participants after they have attended the workshop and had time to use the information provided (e.g., six months post-workshop). The AWC will rely on WPACs to provide performance evaluation information approximately 18 months following the release of the guide and workshop materials. The survey may reduce the effort required to gather this information.

# Appendix A — Terms of Reference

Building Resiliency to Multi-Year Drought:  
Tools for Small Urban and Rural Municipalities  
Project Team Terms of Reference

Approved by the Alberta Water Council on November 2019.

## Context

Multi-year droughts are recurrent events throughout Alberta's history, with significant impacts to our environment, economy, and society. A drought is described as a prolonged period of abnormally dry weather that depletes water resources.<sup>4</sup> Depleted water resources may include natural sources (e.g., rivers, streams, lakes, groundwater) as well as man-made storage (e.g., reservoirs, dugouts). Drought management at the municipal and community level considers the impacts of depleted water resources on environmental, economic, and social needs and expectations. The risks and impacts associated with multi-year droughts are greater, requiring advanced and ongoing preparation.

Alberta was among the hardest hit provinces in the 2001-2002 drought, one of Canada's most expensive natural disasters, with wide-ranging impacts to multiple sectors.<sup>5</sup> Evidence indicates that droughts may increase in frequency and severity with climate change.<sup>6</sup> Yet, drought management is often not at the forefront of local priorities until a new event occurs.<sup>7</sup> There is a need to build awareness about the risks associated with multi-year droughts to foster better adoption of existing tools and resources. In October 2017, the Alberta Water Council (AWC) launched a working group to explore a potential project on multi-year drought resiliency, based on a Statement of Opportunity brought forward by the Watershed Planning and Advisory Councils (WPACs).

Various drought-related programs, tools and resources already exist or are in development in Alberta. Examples include ongoing work by the Miistakis Institute to support drought planning,<sup>8</sup> provincial guidance on developing water shortage response plans,<sup>9</sup> and water supply data and other resources on the Government of Alberta website.<sup>10</sup> However, awareness of these resources

4 Canadian Disaster Database. Available online: <https://www.publicsafety.gc.ca/cnt/rsrscs/cndn-dsstr-dtbs/ffrnc-tbl-smbls-dfntns-en.aspx>. Accessed February 20, 2018.

5 Agriculture and Agri-Food Canada. Lessons learned from the Canadian Drought Years 2001 and 2002. Available online: <http://www.agr.gc.ca/eng/programs-and-services/list-of-programs-and-services/drought-watch/managing-agroclimate-risk/lessons-learned-from-the-canadian-drought-years-2001-and-2002/?id=1463593613430>. Accessed January 31, 2018.

6 Wheaton, E., D. Sauchyn and B. Bonsal. 2016. Future Possible Droughts. In *Vulnerability and Adaptation to Drought: The Canadian Prairies and South America* (pp. 59-76). Available online: <http://press.ucalgary.ca/books/9781552388198>. Accessed February 28, 2018.

7 In a survey conducted by the Miistakis Institute in 2017 with 27 municipalities in the South Saskatchewan River Basin, the majority of municipalities indicated that they do not currently have a drought management plan and rated drought mitigation planning as closer to "not a priority", as opposed to a "very high priority".

8 See <http://www.adaptaction.ca/> for a web tool already developed by the Miistakis Institute.

9 Government of Alberta. Preparing Water Shortage Response Plans. Available online: <http://aep.alberta.ca/forms-maps-services/directives/documents/PreparingWaterShortageResponse-Apr23-2014A.pdf>. Accessed March 21, 2018.

10 For examples, see [https://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/ppe3883](https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/ppe3883), <https://rivers.alberta.ca/>, and <https://agriculture.alberta.ca/acis/>.



is lacking. Information is difficult to access and has not been synthesized to support the iterative cycle of multi-year drought management at the municipal and community scale. In addition, most existing tools focus on drought planning, with fewer resources on drought response and recovery. Geographically, efforts in Alberta have mostly targeted water management planning under the *Water Act* in the South Saskatchewan River Basin. Communication on drought management and delivery of tools and resources across the province needs to consider a basin-specific context, including differences in who can be affected by drought and how.

This project proposes to build on existing work and address resource gaps by examining other jurisdictions with proven drought management plans. The final products aim to facilitate the delivery of customizable information by WPACs to support municipalities and communities across the province before, during and after a multi-year drought. Small urban and rural municipalities are WPACs' key target audience for this work, given their capacity challenges, competing local priorities, and potential for impact.

## **Strategic Intent (Goal)**

This work will assist WPACs as they engage municipalities and communities within their watershed to better plan for, mitigate, respond to and recover from multi-year droughts.

## **Objectives**

1. Highlight the importance of multi-year drought management in Alberta by documenting lessons learned from previous droughts and expected changes due to climate change
2. Compile existing drought management information and resources in Alberta and case studies from selected jurisdictions
3. Increase awareness of federal, provincial and municipal water management roles, responsibilities and regulations relevant to drought
4. Provide guidance on management objectives, potential risks and impacts, triggers and suggested actions for small urban and rural municipalities before, during and after a drought
5. Produce a guide and workshop materials to support WPACs in engaging small urban and rural municipalities

## Key Tasks

1. Develop a work plan that includes key tasks, deliverables, and timelines
2. Compile historical examples of multi-year droughts in Alberta, lessons learned and expected changes due to climate change through literature review and targeted interviews
3. Document drought-related information and resources relevant to Alberta (e.g., decision-making processes, roles and responsibilities, regulations, communication processes, existing tools and programs)
4. Examine case studies of municipal and community drought management from selected drought-impacted jurisdictions outside of Alberta
5. Develop guidance on management objectives, potential risks and impacts (environmental, economic and social), triggers and suggested actions at the municipal level before, during and after a drought
6. Assemble an education and outreach task team to:
  - a. Develop a guide that presents information from key tasks 2 to 5
  - b. Produce supporting materials for workshop delivery by WPACs (e.g., workshop outline, presentation, workshop and follow-up participant survey)
7. Work with WPACs to test the draft guide and supporting materials via a workshop
8. Develop a process for performance evaluation and review to keep the guide and workshop materials current
9. Provide regular updates to the AWC board during the project and a final guide and supporting workshop materials

## Timelines and Deliverables

The project team will provide the following deliverables to the Alberta Water Council:

- Initial findings . . . . . November 2018
- Draft guide and results from workshop . . . . . February 2020
- Final guide and supporting workshop materials . . . . . June 2020

## Membership

Open to AWC Members and other relevant groups identified by the project team. The project team will operate in a manner that is consistent with the rules, policies and procedures adopted by the AWC, including the use of consensus to make decisions in a multi-stakeholder process.

## Budget

No project-specific funding is expected to be required. AWC core funding is available to cover the budget of \$65,000 as follows:

Stakeholder support	\$ 40,000
Hosting	\$ 10,000
Communications (design, layout, printing* and video)	\$ 15,000
<b>Total</b>	<b>\$ 65,000</b>

\*AWC will cover the printing costs for a limited number of guides.



## Appendix B — Acknowledgements

The AWC acknowledges the contributions of the following working group, project team, task team members, and their organizations, who volunteered time and expertise to this work.

## Working Group

Brett Purdy	Alberta Innovates
Carmen de la Chevrotiere	Alberta Environment and Parks
Fiona Briody	Crop Sector Working Group
Judy Stewart	Alberta Lake Management Society
Kristen Lorenz	Alberta Agriculture and Forestry
Margo Redelback	Alberta Irrigation Districts Association
Pamela Duncan	City of Calgary
Randy Taylor	Rural Municipalities of Alberta
Susanna Bruneau	Battle River Watershed Alliance
Tim Romanow	Milk River Watershed Council Canada

*Project managers: Marie-Claire St-Jacques, Anuja Hoddinott*

## Project Team

Chandra Tomaras	City of Edmonton
Che-Wei Chung	Alberta Urban Municipalities Association
Fiona Briody	Cropping Sector Working Group
Judy Stewart	Alberta Lake Management Society
Kristen Lorenz	Alberta Agriculture and Forestry
Kyle Swystun	Alberta Environment and Parks
Lauren Makowecki	Alberta Environment and Parks
Margo Redelback	Alberta Irrigation Districts Association
Pamela Duncan	City of Calgary
Brian Brewin	Rural Municipalities of Alberta
Susanna Bruneau	Battle River Watershed Alliance
Tim Romanow	Milk River Watershed Council Canada

*Project managers: Marie-Claire St-Jacques, Anuja Hoddinott, Katie Duffett, Cara McInnis, Candice Sawchuk, Alec Carrigy*

## Education and Outreach Task Team

Judy Stewart	Alberta Lake Management Society
Madeline Bemrose	Alberta Environment and Parks
Maggie Romuld	Retired
Cal Kullman	Riverwatch
Janine Higgins	Alberta Environment and Parks
Jane Price	Alberta Environment and Parks
Ryan Leuzinger	Alberta Urban Municipalities Association

The AWC thanks the following individuals for providing interviews:

Amy Needham	City of Grande Prairie
Brent Paterson	Retired (formerly Alberta Agriculture and Forestry)
David McGee	Retired (formerly Alberta Environment and Parks)
Dawn Smith	Town of Okotoks
Gordon Zobell	Raymond Irrigation District
Jamie Giberson	Aspen Regional Water Services Commission (Athabasca)
Jay Slempp	Special Areas Board
John Jagorinec	City of Calgary
Normand Boulet	M.D. of Smoky River
Richard Phillips	Bow River Irrigation District
Rick Atkins	Retired (formerly Alberta Agriculture and Forestry)
Ron Jackson	Athabasca County
Tracy Scott	Ducks Unlimited

The AWC thanks the following individuals for participating in the pilot workshop:

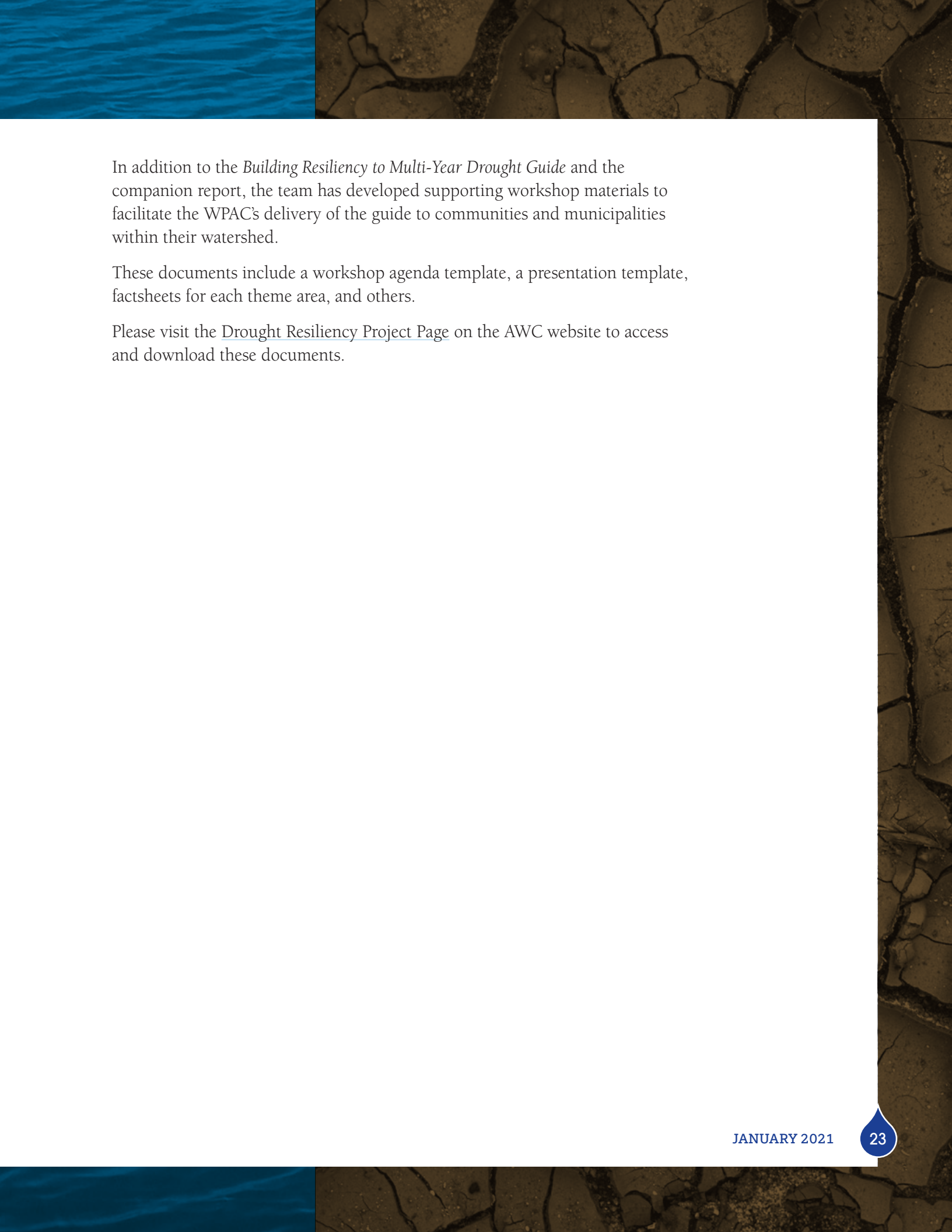
Al Corbett	Battle River Watershed Alliance (Board)
Alex Mochid	Rural Municipalities of Alberta
Barry Bruce	Beaver County
Bettina Van Nieuwkerk	Camrose County
Dale Pederson	Beaver County
David Samm	Battle River Watershed Alliance (Staff)
Emily Baum	City of Camrose
Greg King	University of Alberta & Battle River Watershed Alliance (Board)
Greg Lewin	City of Camrose
Howard Shield	Flagstaff County
Jeremy Enarson	City of Camrose
Kelsey Fenton	Flagstaff County
Kevin Smook	Beaver County
L. J. Ferguson	Battle River Watershed Alliance (Board)
Midge Lambert	Battle River Watershed Alliance (Board)
Nathalie Stanley Olson	Battle River Watershed Alliance (Staff)
Paul McLauchlin	Rural Municipalities of Alberta
Ryan Hallett	County of Stettler
Sarah Skinner	Battle River Watershed Alliance (Staff)

The AWC Staff would also like to thank Christa Edwards, who supported this work through her role as Board and Office Coordinator.



# Appendix C — Workshop Supporting Materials





In addition to the *Building Resiliency to Multi-Year Drought Guide* and the companion report, the team has developed supporting workshop materials to facilitate the WPAC's delivery of the guide to communities and municipalities within their watershed.

These documents include a workshop agenda template, a presentation template, factsheets for each theme area, and others.

Please visit the [Drought Resiliency Project Page](#) on the AWC website to access and download these documents.



# Appendix D — Workshop Summary Notes

## Pilot Workshop: Building Resiliency to Multi-Year Drought

**Date:** Tuesday, December 10, 2019

**Time:** 9:30 a.m. – 2 p.m.

**Place:** Battle River Watershed Alliance Office  
Mirror Lake Centre, Lower Level  
5415 49 Avenue, Camrose T4V 0N6

### In Attendance

#### Name

#### Organization

Al Corbett	Battle River Watershed Alliance (Board)
L. J. Ferguson	Battle River Watershed Alliance (Board)
Midge Lambert	Battle River Watershed Alliance (Board)
Sarah Skinner	Battle River Watershed Alliance (Staff)
Nathalie Stanley Olson	Battle River Watershed Alliance (Staff)
Barry Bruce	Beaver County
Dale Pederson	Beaver County
Kevin Smook	Beaver County
Bettina VanNieuwkerk	Camrose County
Emily Baum	City of Camrose
Jeremy Enarson	City of Camrose
Greg Lewin	City of Camrose
Ryan Hallett	County of Stettler
Kelsey Fenton	Flagstaff County
Howard Shield	Flagstaff County
Paul McLauchlin	Rural Municipalities of Alberta
Alex Mochid	Rural Municipalities of Alberta
Greg King	University of Alberta and Battle River Watershed Alliance (Board)

### AWC Drought Resiliency Project Team

### Organization

Margo Redelback (Co-chair; presenter)	Alberta Irrigation Districts Association
Katie Duffett (Project Manager)	Alberta Water Council
Cara McInnis (Communications Advisor)	Alberta Water Council
Tim Romanow (Co-chair; presenter)	Milk River Watershed Council

## Workshop Objectives

1. Review the *Building Resiliency to Multi-Year Drought Guide* and how it is used
2. Receive feedback on the workshop, supporting materials, and the guide
3. Ensure participants understand the roles and responsibilities relating to drought planning and response
4. Ensure participants know where to find resources for different stages of drought

## Agenda

1. Administrative Items
  - a. Health, safety, and introductions
  - b. Review workshop objectives
  - c. Who is the guide and workshop for?
2. What Is Drought?

Review the definitions of drought and their impacts
3. Drought in Alberta: Past, Present, and Future
  - a. Review the history of drought in Alberta
  - b. Review the history of drought in the Battle River Watershed
4. Roles and Responsibilities
  - a. Review the roles and responsibilities table
5. Strategies, Tools, and Resources
  - a. Review the list of strategies, tools, and resources in the draft guide
  - b. Municipality specific strategies, tools, and resources
6. Debrief
  - a. Debrief on the workshop activities

Margo called the workshop to order at 9:42 a.m.

## 1. Administrative Items

The meeting objectives and agenda were reviewed.

The drought resiliency project was brought forward to the Alberta Water Council (AWC) from Alberta Watershed Planning and Advisory Councils (WPACs). The intent is to provide tools and direction for addressing multi-year drought in an accessible package that WPACs can use to engage their municipal partners and which municipalities could learn and use. The workshop is a pilot of the guide, supporting materials, and the workshop delivery, and the AWC is seeking feedback to improve the project's outcomes.

One of the key aspects of future workshops that was missing from the current one is delivery of a survey to participants before the workshop. The survey is meant to focus the workshop content on the strategies, tools, and resources that are most relevant to the watershed where the workshop is being held. As a result, the content of the current workshop is broader and less detailed than what is expected from workshops held after the AWC completes the project and finalizes the deliverables.

The participants were asked about water-related concerns in the Battle River Watershed area. Responses included the following:

- water-sharing agreements
- livestock
- drinking water supply
- diverse geological features of the watershed
- long-term environmental context related to drought
- water supply management

## 2. What Is Drought?

Margo and Tim provided a presentation that outlined *Module 1: What is Drought?* From the draft *Building Resiliency to Multi-Year Drought Guide* (see attachment 1).

Drought types were defined by the impacts and included meteorological, agricultural, hydrological, and socio-economic droughts.

## Discussion

- The mental health aspects of drought are often overlooked, but they can be significant and can impact entire communities. Drought can also be more pronounced in rural areas where individuals can be more quickly impacted by water shortages (e.g., farmers).
- The definition of agricultural drought is based on soil moisture level, but this could be expanded to include additional impacts, such as on forest production and cow-calf operations.
- Natural systems can take centuries to recover from multi-year droughts, and it is one of the top climate hazards in some places.
- In remote areas, food production can be heavily impacted by drought.

## 3. Drought in Alberta: Past, Present, and Future

Margo and Tim reviewed *Module 2: History of Drought in Alberta* from the draft guide (see attachment 1).

Drought in Alberta is natural and recurrent, with five major droughts occurring in the last 120 years — some of which have lasted over a decade. Droughts of greater intensity and longer duration are expected in the future, along with greater weather extremes.

Sarah provided a presentation on the Battle River Watershed, including information on the geography of the region and the variability of annual flows (see attachment 2).

## Discussion

- This discussion is predominantly about water quantity, but increased occurrence and intensity of wildfires is also an impact of droughts. Wildfire is something that municipalities will have to plan for and include in the drought-planning process. Municipalities need to ensure water is available for human needs, but water supplies for fire suppression are also important.
- Battle River is 273% allocated primarily because of large senior water licences with ATCO. There is a requirement in these licences to return most of the water to the river. Approximately 15 to 20% of the water is allocated for consumptive uses, and there is a requirement that 50% of the flow crosses the provincial boundary to Saskatchewan.

- The Battle River Watershed has an approved Water Management Plan from Alberta Environment and Parks that sets a maximum volume on water licence allocations. The upper volume allocation is higher than the flow volume in some minimum flow years, and serious conversations are needed to determine how the available water can be equitably shared while allowing 50% of the flow to continue to Saskatchewan.
- There is insufficient understanding about the water licences in the region and their purposes. AEP has a webpage that allows readers to look at the terms and conditions of specific licences.
- During the 2001 – 2002 drought, water licence holders in the St. Mary river system were successful in negotiating a water-sharing agreement between everyone who wanted to sign on. The participants all agreed to cut back their water consumption by a certain percentage, and they signed a new agreement that gave everyone the same seniority as the highest seniority licence. Within an approved Water Management Plan from AEP, there are mechanisms to make these sorts of agreements, but AEP staff have to be involved.
- It is important to talk about the average annual flow and compare it to water availability. The flat-line average flow that allocations are based on does not represent reality. It doesn't matter how big your water licence is, if the water does not exist in the system.
- Water apportionments are a large challenge when you're dealing with provincial or international borders.

#### 4. Roles and Responsibilities

Margo and Tim reviewed *Module 3: Roles and Responsibilities* of the draft guide. It included the roles and responsibilities of provincial government departments, municipalities and municipal associations, and other bodies (e.g., Alberta Emergency Management Agency, Alberta Energy Regulator, local agencies) for drought mitigation and recovery (see attachment 1).

##### Discussion

- *Stepping Back from the Water* is a valuable tool that is not well known. It assists with justifying and setting bylaws.
- Land use and land-use planning bylaws can be useful to help protect environmentally sensitive areas.

- The provincial government will continue to put the workload onto the backs of municipalities that may be struggling with new pressures and policies to ensure approvals are done correctly.
- AEP is one of the go-to organizations regarding water-sharing agreements. They also provide resources for monitoring and forecasting drought.
- Camrose County has a good GIS department, which can help make good land-use planning decisions.
- Water Shortage Committees are driven by Water Management Plans. The committees come together when certain drought thresholds are met. If there is a need to initiate these committees, the draft guide could be a helpful jumping-off point for establishing them.
- Counties receive information from the provincial government on drought forecasting, but the focus is primarily agriculture.
- When prioritizing water uses, drinking water should come before oil and gas uses.
- There is a real concern with fracking in the Battle Lake area; if things go wrong it would be a huge risk for the drinking water supply. Addressing these concerns is likely the role of the Alberta Energy Regulator, but there is an opportunity for municipalities to take the lead and work with industry. The AWC recently completed the guide *Source Water Protection Planning*, which may be useful for these conversations.
- A role that's missing from the draft guide is the administration of public lands. During a drought, these lands can be made available to landowners for grazing and production. Ducks Unlimited has also done this, and it makes a large difference in drought conditions.
- First Nations and Métis are missing from the roles and responsibilities table. While not applicable to all watersheds, some communities have intermunicipal agreements with Indigenous communities.
- Landowners are also missing from the roles and responsibilities table.
- The role of the federal government isn't clear but is relevant for watersheds that are near Crown lands or parks. Federal government representatives will be included in the sector review and approval process for the results of the AWC's project, but the guide has largely been focused on local planning in the provincial context. There are a lot of considerations for municipalities adjacent to federal lands, so they should at least know who to contact for help.
- The roles and responsibilities laid out in the draft report could be more easily digested by readers if there was a graphic or other visual demonstrating interconnections or a hierarchy of the organizations.



## 5. Strategies, Tools, and Resources

Margo and Tim reviewed *Module 4: Management Objectives, Strategies, Tools, and Resources* of the draft guide, including a brief overview of the theme areas and the strategies within each (see attachment 1).

### Discussion

- This section would have been narrowed down through the pre-workshop survey. The priority themes identified by the workshop attendees would have been reviewed in more detail.
- Module 4 is the largest part of the guide and is the information the project team hopes that WPACs and municipalities can use to develop a drought mitigation plan. The format is similar to an Environmental Farm Plan to allow municipal and WPAC representatives to focus on the strategies and tools they can use.
- A Water Shortage Response Plan may be short term and based on something specific (e.g., operation of a water treatment plant). It contains information that can be used in a Drought Management Plan, but a Drought Management Plan encompasses much more. Some municipalities may have aspects of both in a single document, depending on their individual circumstances.
- A municipality can declare an emergency, but it does not automatically trigger funding. It creates awareness and can initiate the discussion with the provincial government; if a municipality wants to apply for emergency funding from the provincial government, they are not eligible until they have declared a state of emergency.
- Public education is an important aspect of drought management. When possible, joint messaging between municipalities is helpful. It can help citizens become drought proofed (e.g., ensuring they have enough feed to last the year). A mechanism for this includes the Working Well Workshops. If incentives are available for actions that help with drought mitigation (e.g., building dugouts), public education campaigns can include that kind of information.

The workshop participants were separated into breakout groups. Each team was given a stage of drought (before, during, or after), and was asked to identify the themes and strategies important for their municipality. The breakout groups then rejoined the other workshop participants and reported on their discussions. The results of the exercise are summarized in the next sections.

## Before a Drought

- “Monitoring and Data” and “Planning for Drought” are two key themes for this stage.
- Some information needs were identified, including lake or reservoir levels, flow information, and groundwater well monitoring data. The sources for the data, particularly for groundwater, were not known.
- A clear understanding of the existing water licences and how that understanding impacts water supply and demand are important.
- Development of a Water Shortage Response Plan or a Drought Management Plan would be useful; they could potentially be combined into a single document.
- “Public Education” and “Collaboration” are also important themes and could include asking individual residents to monitor their well levels and any changes over time.
- Municipalities will also need to identify key partners for collaboration and implementation of a Drought Management Plan, including identifying stakeholders who should receive information on the plan, even if they are not direct contributors.
- Plans for emergency management are needed, and they should include resources for control of wildfires.
- Managing water supply in the context of agriculture is important, particularly for rural areas.

## During a Drought

- Activation of a Water Shortage Committee will be key during a drought to ensure that the partners and players needed to make water supply and management decisions can easily be called together.
- Any water-sharing agreements or emergency plans related to groundwater wells should be activated when they become depleted.
- Some municipalities have mapped their emergency water supplies and connected that with emergency services partners. This ensures that there is enough water for fire suppression needs.
- Water conservation messaging is very important.
- It may be possible for municipalities to tap buried aquifer channels, but groundwater mapping before a drought is required.

- There should be a process in place to fast track emergency licences, whether they are a temporary diversion licence or an emergency well licence.
- A communication network that includes water commissions and regionalized water co-ops should be activated so everyone knows of any triggers, limits, and actions and who to contact.
- Brackish water should be used for situations where potable water is not needed, such as dust suppression.
- Municipalities can't lose sight of the community health aspects, and they should ensure the public is aware of the resources available (e.g., crisis hotlines and other community-support mechanisms).

### **After a Drought**

- “Collaboration” and “Community and Health” are important themes following a drought.
- It is important to keep and maintain the relationships formed before and during a drought to build on the experience and improve the response to future droughts. Improving the response may include establishment of a stakeholder committee to make or revise a Drought Management or Water Shortage Response Plan.
- A Drought Impact Committee should be established to help support long-term literacy and support for mental health. Once a drought is finished, people will still be stressed with the situation or the aftermath and support for them is important.
- After a drought is over, it may be many years before the drought mitigation and recovery resources or committees are needed. It's important to maintain both relationships between stakeholders and the acquired knowledge base. Ways of doing this include sharing yearly situational analysis reports with the committees and municipal partners and documenting any changeover in staff.
- The most important strategy for a municipality is to ensure that the people experiencing the drought can access the available resources. Some people in the community may not have access to email or other media channels, so getting the information to them may be challenging.

### General Comment

- None of the breakout groups specifically talked about the “Ecological Systems” theme. This was partially due to time constraints, but also because human needs for water will be prioritized over the needs of ecological systems.

## 6. Debrief

Workshop participants were asked for initial feedback on the draft guide, supporting materials, and the delivery of the workshop itself. Responses included the following:

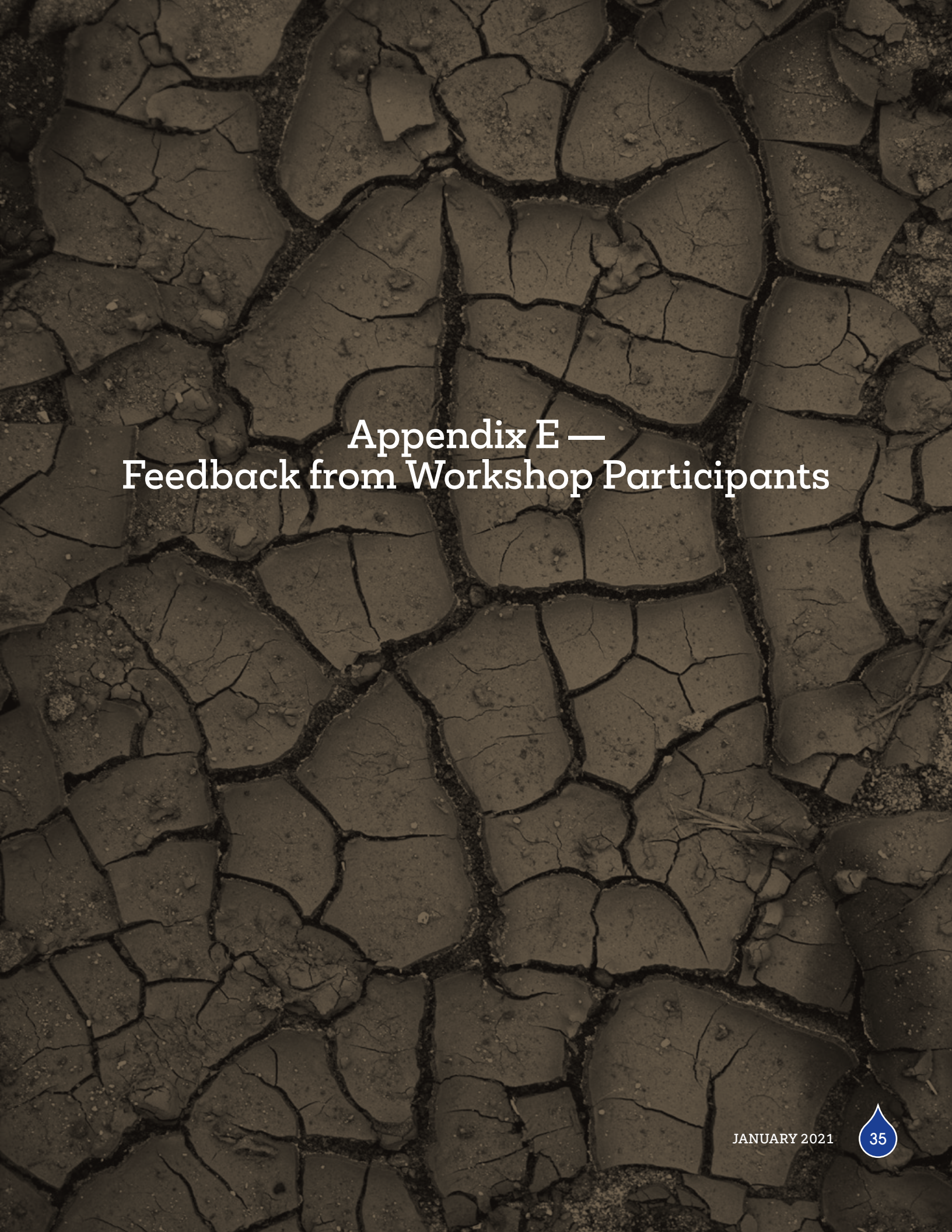
- It would be useful to provide a binder of the documentation before the workshop, rather than just by email.
- A watershed specific list of priority topics to tailor the breakout group discussions would make them more effective.
- The information provided was valuable.
- There are some additions needed to the roles and responsibilities, including First Nations and Métis, the federal government, and any industries or businesses in the watershed who have water licences or would be impacted by Drought Management or Water Shortage Response Plans. This should include insurance agencies (e.g., Agriculture Financial Services Corporation).
- Many municipalities are not thinking about five- or ten-year droughts, but it’s a good discussion to have.
- There are excellent existing resources and relationships, and the guide will help municipalities leverage these.
- It would be useful to include best practices or case studies on the information sheets for each theme.

Participants were advised that a feedback survey would be distributed following the workshop. They were also invited to submit any edits on the report or any of the materials.

Once the project is complete, there will be a “train the trainer” exercise for WPACs in preparation for them to hold their own drought resiliency workshop using the package developed by the AWC.

## 7. Adjournment

The meeting was adjourned at 3:00 p.m.



# Appendix E — Feedback from Workshop Participants

# Drought Resiliency Pilot Workshop — Feedback Summary

December 10, 2019, Mirror Lake Centre, Camrose

## General

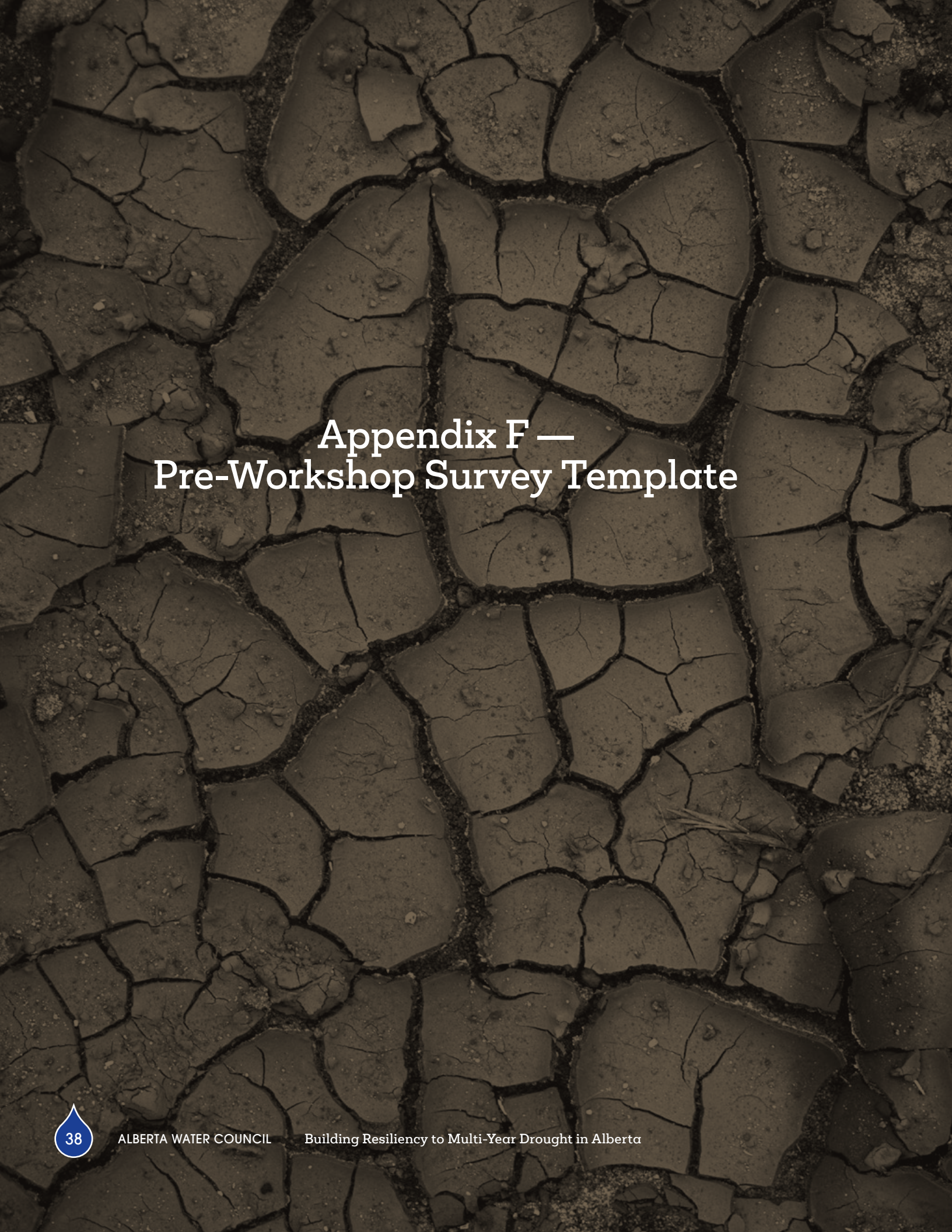
- The guide and workshop are both useful for municipalities.

## Draft Drought Guide

- The definition for agricultural drought should be broader than just soil moisture; there are many other factors involved.
- It would be helpful if there was a section of the guide that listed information sources for municipalities, particularly related to the monitoring and data theme. The information is currently present in the guide, but it is not in a single place.
- The role of First Nations and Métis communities should be included in the “Roles and Responsibilities” section of the guide.
- A visual representation of the roles and responsibilities that shows the hierarchy of the various actors would be useful to have in addition to the table.
- Additional information on the roles and responsibilities of the RMA is needed for Module 3.
- Considerations for municipalities that border on federally owned land should be included in the guide.
- Increased risk of fires is a concern related to drought that isn’t talked about in detail in the guide.
- Industries and businesses within the watershed should be included in the “Roles and Responsibilities” section of the guide.

## Workshop Delivery and Supporting Materials

- A binder including the guide, the factsheets, the roles and responsibilities handouts, and the worksheets should be provided to participants before the workshop.
- The individual theme factsheets should include any relevant case studies or best practices from that section of the guide to provide more practical examples of how the theme can be implemented.
- It is important to talk about variability in annual average flows; the average flat line that allocations are based on does not represent reality.
- Risks to the watershed (e.g., fracking near sensitive areas) should be identified by the WPAC before the workshop, if possible; not all risks to water supply are naturally occurring.
- There is a lot of information in the guide, and the pre-workshop survey to help prioritize critical themes or concerns would have been helpful to focus the discussion.
- The breakout groups didn't have enough time to review all the themes relevant for their stage of drought; focusing that discussion on priority areas would be beneficial.



# Appendix F — Pre-Workshop Survey Template



## Pre-Workshop Survey

### Workshop Details

WPAC: \_\_\_\_\_

Workshop date: \_\_\_\_\_

Name (optional): \_\_\_\_\_

Organization: \_\_\_\_\_

### Questions

Question No. 1: Are you familiar with the different types of drought and their impacts? The types are meteorological, agricultural, hydrological, and socio-economic.

Answer \_\_\_\_\_

\_\_\_\_\_

Question No. 2: Have you experienced drought in your region? If yes, how long ago was it and how long did the drought last?

Answer \_\_\_\_\_

\_\_\_\_\_

Question No. 3: Do you know which levels of government or local agencies are responsible for different aspects of drought management in your region? Would you like more information on the roles of municipalities, provincial government, federal government, or other agencies (AUMA, RMA, WPACs, Watershed Stewardship Groups, etc.)

Answer \_\_\_\_\_

\_\_\_\_\_

Question No. 4: Which themes are most relevant to your region? Please select up to five.

- Monitoring and Data — Reveal major trends, determine triggers, and inform management decisions
- Planning for Drought — Facilitate actions before, during, and after a drought to reduce risks
- Supply Management — Provide adequate and clean water for all users at a reasonable cost
- Demand Management — Limit the quality and quantity of water needed for tasks
- Land-Use Planning — Balance the needs of environmental, economic, and social aspects
- Agriculture — A critical part of the economy that can be devastated by droughts
- Ecological Systems — Can be severely impacted by multi-year drought
- Community and Health — Drought-induced mental health illnesses
- Public Education — Create awareness of drought triggers, management, and resources
- Collaboration — Neighbouring water users in your region are likely experiencing similar challenges
- Emergency Management — Organize and manage resources and responsibilities for emergencies
- Funding — Assist with activities from implementing management actions to disaster relief

Question No. 5: Please rank your choices from highest to lowest priority.

Answer \_\_\_\_\_  
\_\_\_\_\_

### **Additional Comments**

Please let us know if you would like the workshop to include any other aspects of multi-year drought resiliency that are not included in the previous questions.



# Appendix G — Post-Workshop Survey Template

## Post-Workshop Survey

### Workshop Details

WPAC: \_\_\_\_\_

Workshop date: \_\_\_\_\_

Name (optional): \_\_\_\_\_

Organization: \_\_\_\_\_

### Questions

Question No. 1: Have you used the *Building Resiliency to Multi-Year Drought Guide* since the workshop?

Answer \_\_\_\_\_

\_\_\_\_\_

Question No. 2: Has your community begun work on any drought resiliency projects as a result of the workshop or guide?

Answer \_\_\_\_\_

\_\_\_\_\_

Question No. 3: Did the workshop or guide help increase your awareness of drought resiliency in your community?

Answer \_\_\_\_\_

\_\_\_\_\_

### Additional Comments

Do you have any further comments on the guide, workshop, or drought resiliency initiatives in your community?



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