12th Annual SABCS Conference:

“Drinking Water Resilience Assessment” Project

By Dení Olivares, Water & Wildfire intern at Interior Health

September 22, 2022

Interior Health | First Nations Health Authority | PACIFIC INSTITUTE FOR CLIMATE SOLUTIONS


I acknowledge with respect and gratitude that I’m sharing my project here with you in the traditional, ancestral and unceded lands of the Musqueam and Squamish people.
I also acknowledge that the place where I work and learn is in the lands of the Syilx/ Okanagan people, whose deep connections with the land continue to this day.

A bit about me...

THE UNIVERSITY OF BRITISH COLUMBIA

- **Program:** Bachelor of Science in Global Health, 3rd year, UBC Vancouver.
- **Region of focus:** Indigenous communities

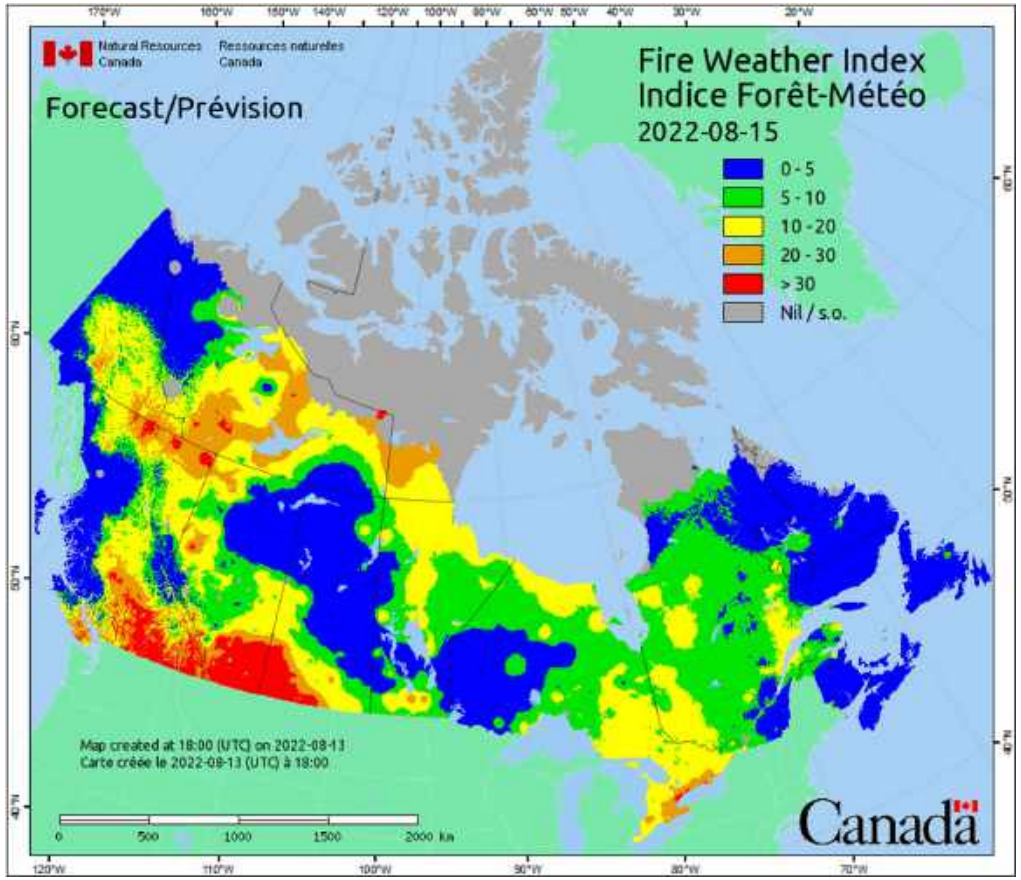
UBC Science Co-op

Interior Health

Presentation Outline

1. **Project Context**: Why this project?
2. **Overview of the Drinking Water Resilience Assessment**:
    a. Phase I: Literature Review.
    b. Phase II: Interviews with Community Members.
        i. Some Learnings and Reflections from these conversations.
3. **Today: Where is the project at?**
    a. Future steps & Timeline.
4. **Questions & Feedback**

1- Project context: Why are we carrying this forward?



Lytton, BC, 2021. Photo credit: Jack Zimmerman, CBC

Credit: Richard Ricciardi via Flickr.

Indirect impacts on water quality

- Trees play an essential role in filtering and capturing water
- Burning vegetation disrupts the water cycle
- Water quality is affected indirectly

Direct impacts on water quality

- Rain washes off contaminants (ash, debris, sediment, nutrients) into the reservoirs
- Known effects from fire retardants contaminating watersheds
- Impacts to drinking water infrastructure
- Water quality is affected directly

ELSEVIER

Science of The Total Environment

Volume 804, 15 January 2022, 149890

Wildfires can increase regulated nitrate, arsenic, and disinfection byproduct violations and concentrations in public drinking water supplies

Michael J. Pennino [a], Scott G. Leibowitz [b], Jana E. Compton [b], Mussie T. Beyene [c], Stephen D. LeDuc [d]

Credit: Donovan Wagner, Hiilite Photography.

Resilience means different things to different people.

We need appropriate and culturally-inclusive criteria to define resilience, and apply it to identify the water systems at most risk of climate change impact.

2- Overview of the “Drinking Water Resilience Assessment”

PROJECT PURPOSE

To build a tool to assess the degree of wildfire resilience of individual water supply systems within the Interior Health region and in consistence with Indigenous ways of knowing.

OBJECTIVES + TIMELINE

Objective 1
Complete a literature search on the existing tools, assessments, and frameworks that determine the resiliency of a water supply system, and the existing pathways of community engagement in the building of these tools.

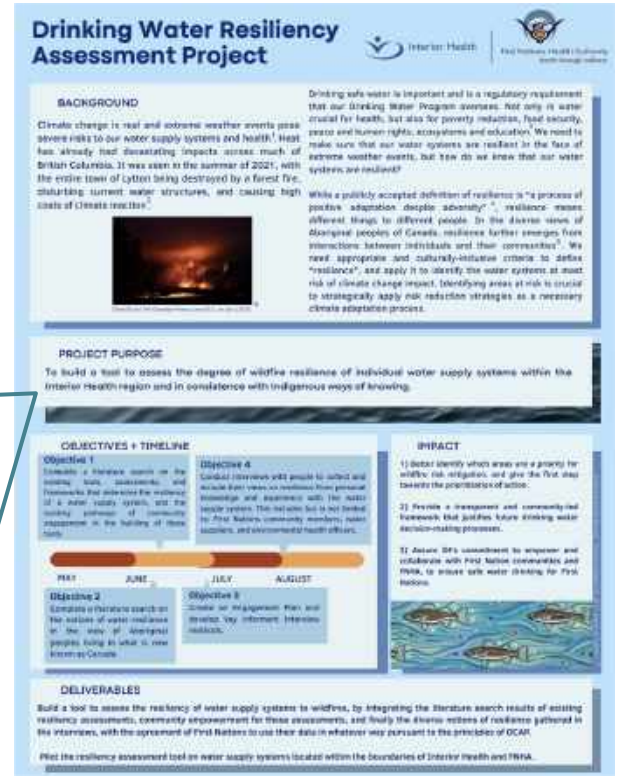
Objective 4
Conduct interviews with people to collect and include their views on resilience from personal knowledge and experience with the water supply system. This includes but is not limited to: First Nations community members, water suppliers, and environmental health officers.

MAY JUNE JULY AUGUST

Objective 2
Complete a literature search on the notions of water resilience in the view of Aboriginal peoples living in what is now known as Canada.

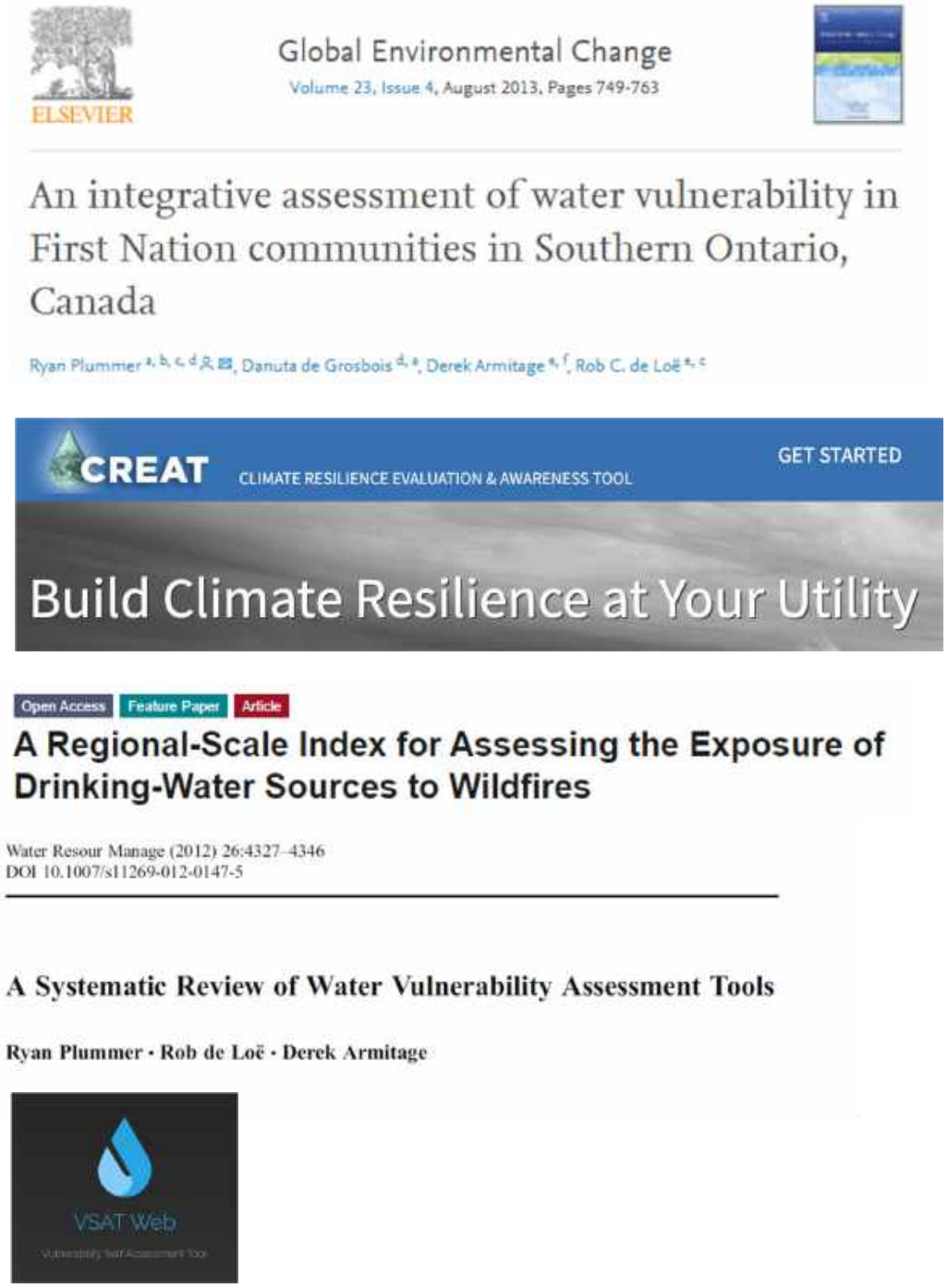
Objective 3
Create an Engagement Plan and develop key informant interview methods.

Project One-pager



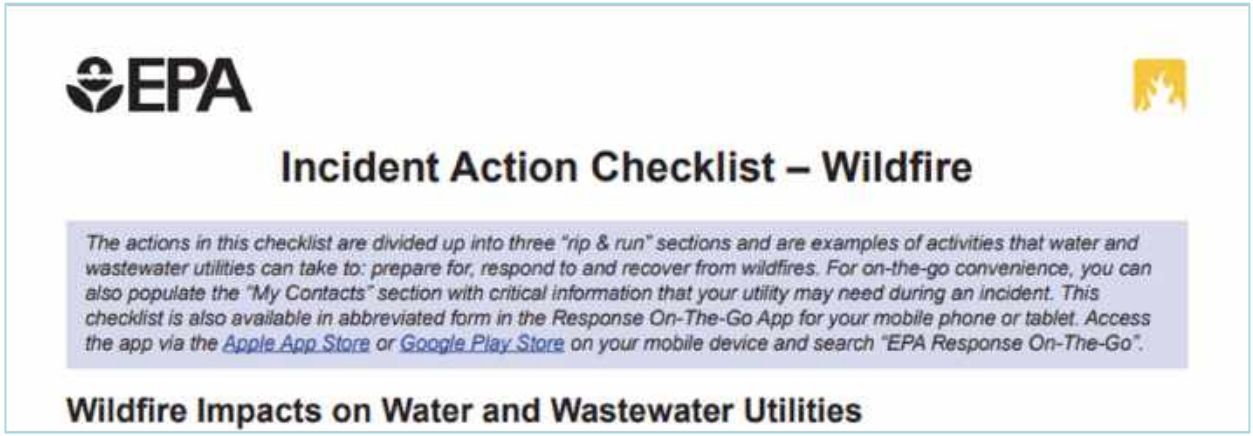
a) Phase I: Literature Review

- **Vulnerability Assessments:** How exposed is a drinking water system to a given threat?
    - Found assessments that had what I was looking for independently
    - Unmanageable to mix them.
- **Best Practices:** What does a resilient system look like in the first place?



a) Phase I: Literature Review, Summary of Results

Best Practices documents: A definition of what a wildfire-resilient drinking water system looks like.

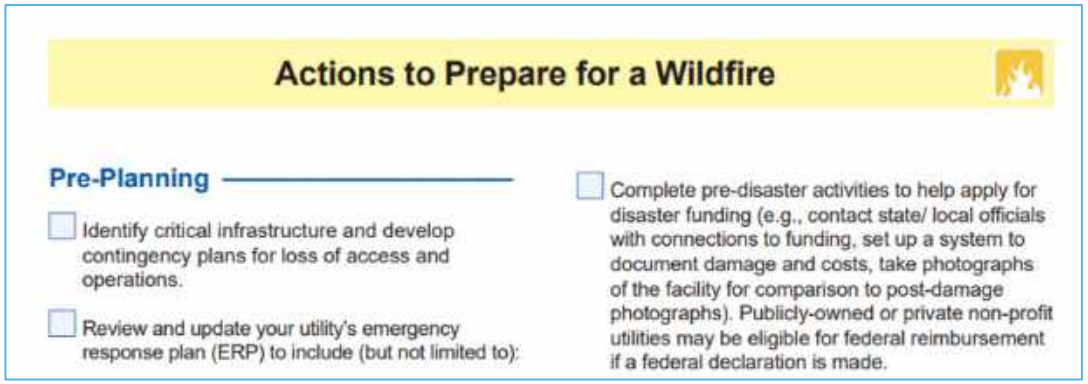


EPA

Incident Action Checklist – Wildfire

The actions in this checklist are divided up into three "rip & run" sections and are examples of activities that water and wastewater utilities can take to: prepare for, respond to and recover from wildfires. For on-the-go convenience, you can also populate the "My Contacts" section with critical information that your utility may need during an incident. This checklist is also available in abbreviated form in the Response On-The-Go App for your mobile phone or tablet. Access the app via the Apple App Store or Google Play Store on your mobile device and search "EPA Response On-The-Go".

Wildfire Impacts on Water and Wastewater Utilities



Actions to Prepare for a Wildfire

Pre-Planning

- ☐ Identify critical infrastructure and develop contingency plans for loss of access and operations.
- ☐ Review and update your utility's emergency response plan (ERP) to include (but not limited to):
- ☐ Complete pre-disaster activities to help apply for disaster funding (e.g., contact state/ local officials with connections to funding, set up a system to document damage and costs, take photographs of the facility for comparison to post-damage photographs). Publicly-owned or private non-profit utilities may be eligible for federal reimbursement if a federal declaration is made.

Water Research Foundation
advancing the science of water

EPA

Effects of Wildfire on Drinking Water Utilities and Best Practices for Wildfire Risk Reduction and Mitigation

A Wildfire-Resilient Drinking Water System Diagram

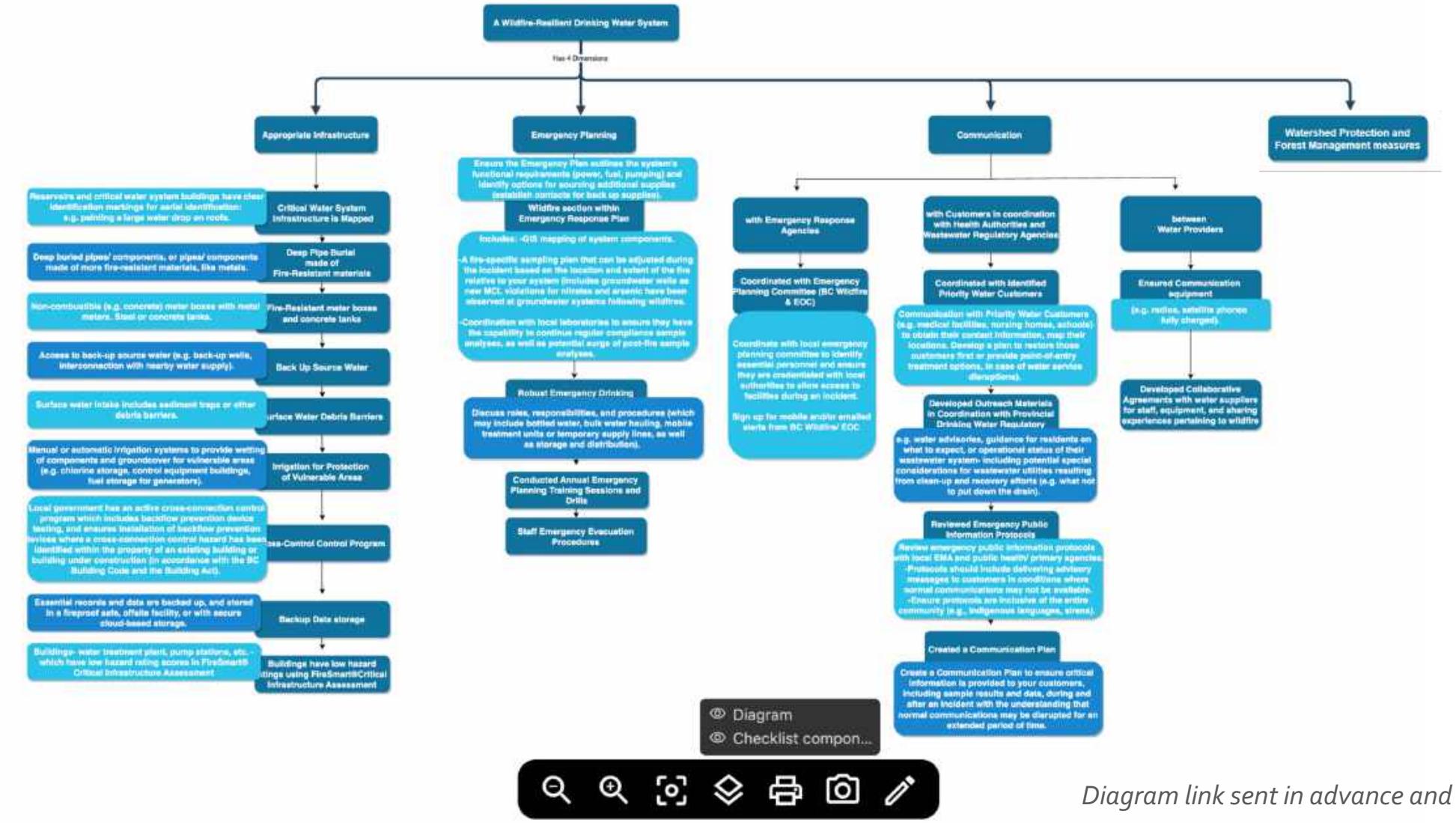
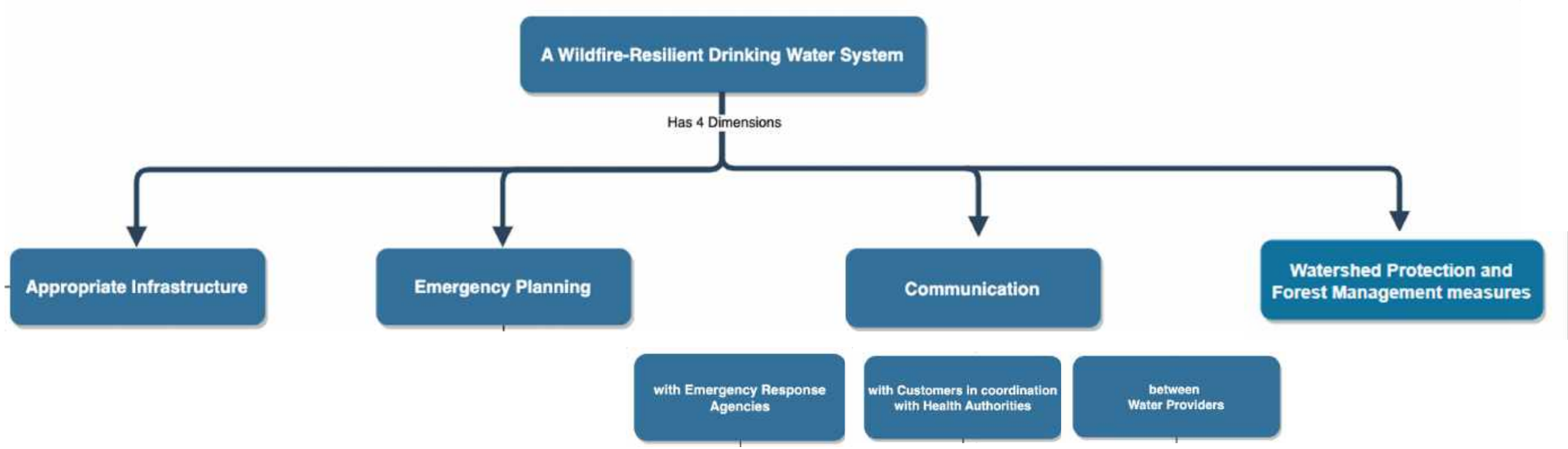


Diagram link sent in advance and on the meeting chat.

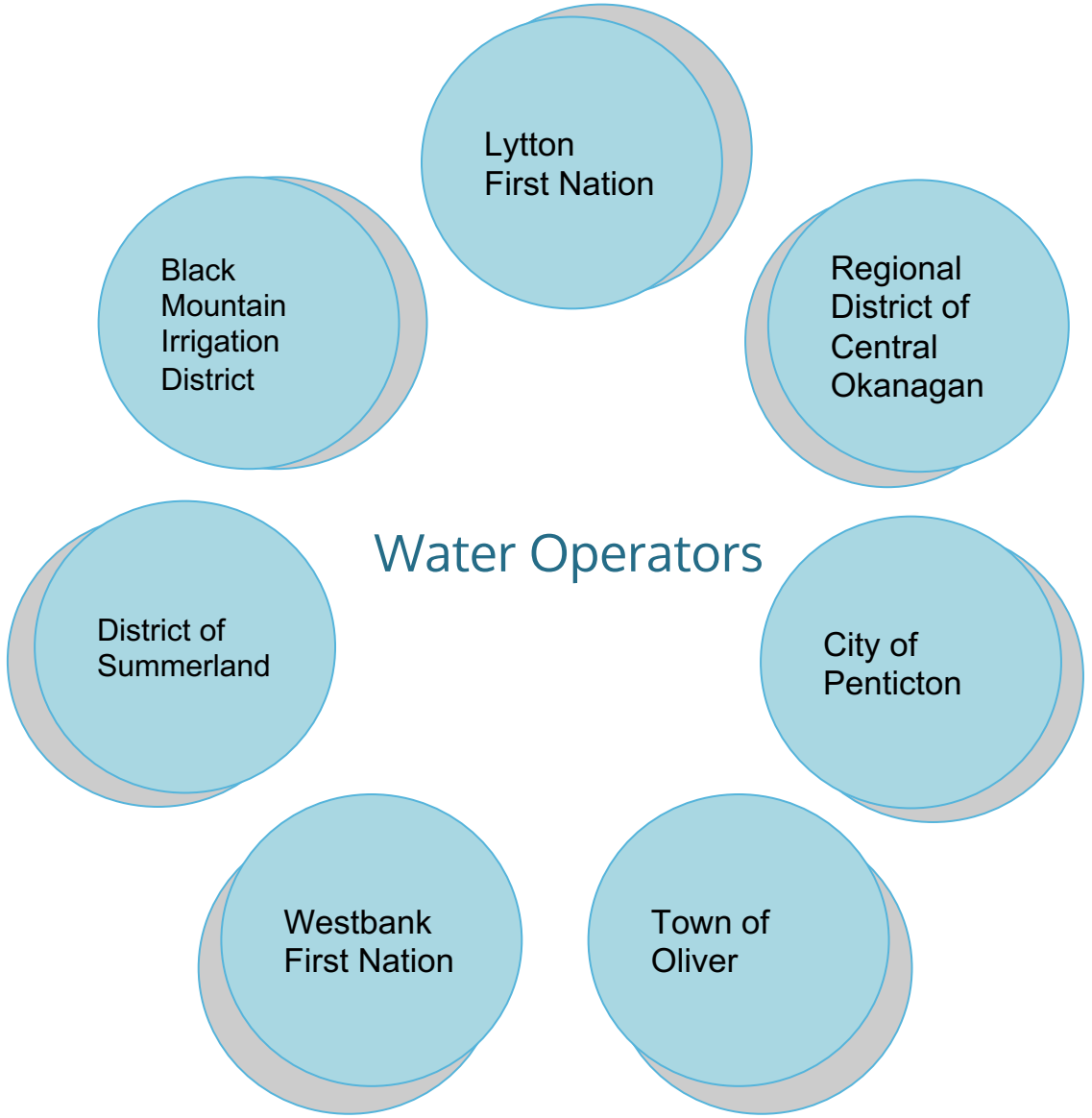

A Wildfire-Resilient Drinking Water System
Has 4 Dimensions
Appropriate Infrastructure
Emergency Planning
Communication
Watershed Protection and Forest Management measures
with Emergency Response Agencies
with Customers in coordination with Health Authorities
between Water Providers

examples:


Irrigation for Protection of Vulnerable Areas
Buildings have low hazard ratings using FireSmart®Critical Infrastructure Assessment
Wildfire section within Emergency Response Plan
Conducted Annual Emergency Planning Training Sessions and Drills
Developed Collaborative Agreements with water suppliers for staff, equipment, and sharing experiences pertaining to wildfire
Hazardous Fuel Reduction
Watershed Rehabilitation after Wildfire event have been performed

b) Phase II: Interviews with Community Members

Key Informant Group	# of people	# of people having experienced wildfires
Water Operators	7	5
Academic Experts	2	0
Leaders	4	1
Emergency Responders	2	1
Government Agencies	10	3



b) Phase II: Interviews with Community Members

Purpose of Phase II: Asking community members, from their personal experiences and cultural knowledge:

Q1: Do you think tool is useful? Feasible?

Q2: What's missing?

Q3: Rank categories from most important to least important.

b) i. Some Learnings and Reflections from the Interview process

1- “One tool can’t be applicable to every single drinking water system in the Interior Region”

The checklist would need to be appropriately scaled for implementation.

Artwork by Christi Belcourt
“Manitou Giigoonh #2, 2017. Acrylic on Canvas”.

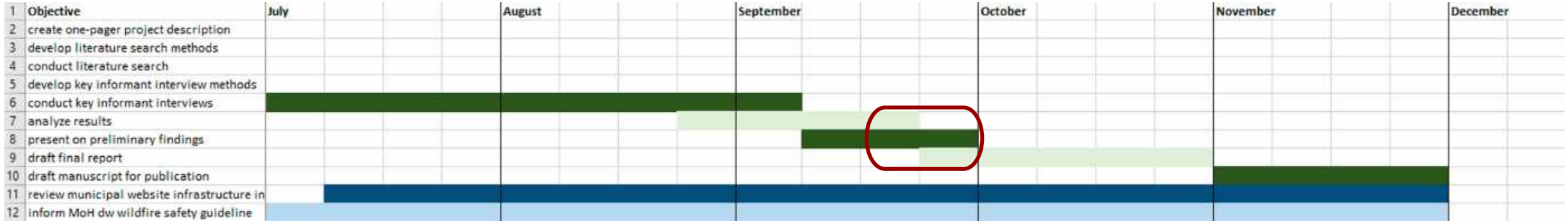
2- “A checklist cannot capture Indigenous ways of knowing and being. It’s about generating discussion between the water operator and the local Indigenous communities”.

In addition to the checklist for engineering and planning purposes, there needs to be dialogue.

- Am I aware of the Indigenous communities in my region?
- Do I have a working relationship with them in regards to managing the water?
- What have I done, as an individual, to be more aware and educated on local Indigenous knowledge pertaining to water in this area?

3- Today: Where is the project at & Future Steps?

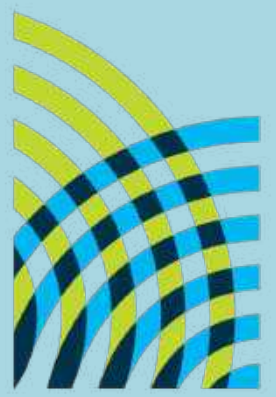
- Now: Phase II, Data Analysis.
- Future Steps: Snapshot of GANTT diagram.



Acknowledgements


Interior Health


First Nations Health Authority


PACIFIC INSTITUTE FOR CLIMATE SOLUTIONS

Thank you for your time and mental space.

I look forward to and genuinely appreciate your feedback and questions.

Deni Olivares: Deni.Olivares@interiorhealth.ca. Cell: (236)-866-3177

Interior Health

References

Bakker, K. & Simms, R. & Joe, Nshemereirwe & Harris, Leila. (2018). Indigenous peoples and water governance in Canada: Regulatory injustice and prospects for reform. 10.1017/9781316831847.013.