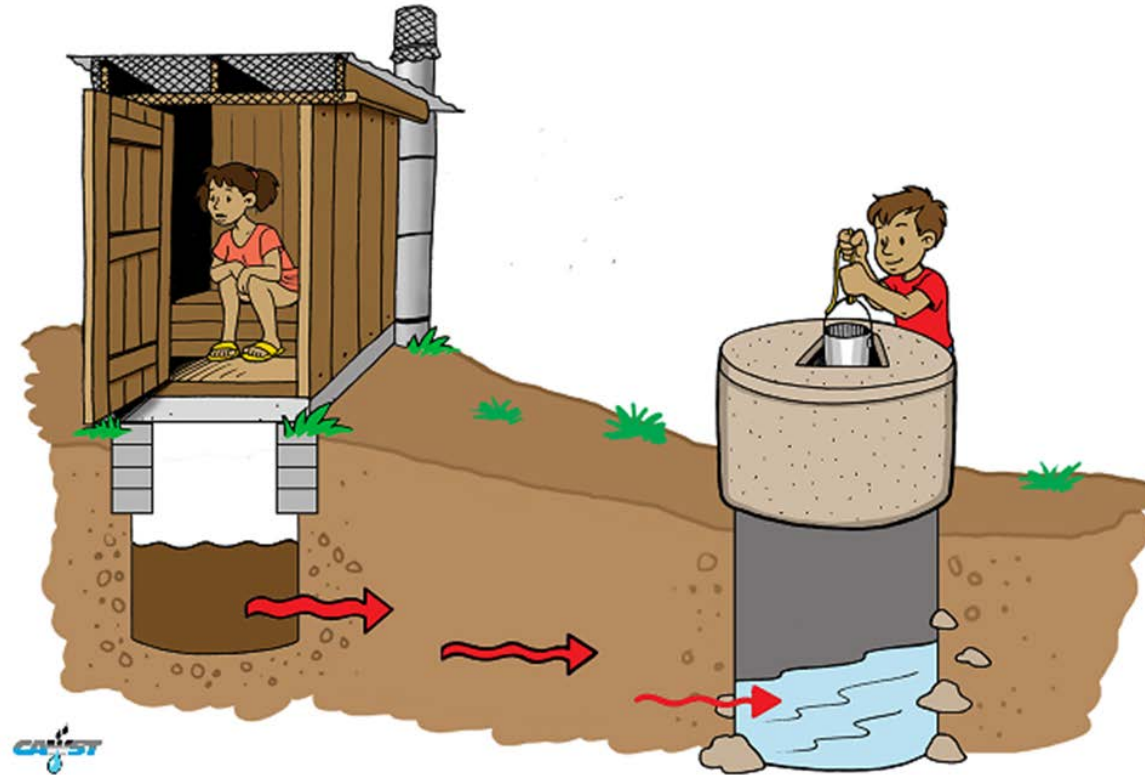


Source Water Protection Planning

June 5, 2018



First picture from NASA of water on Mars



....



http://apod.nasa.gov/apod/image/0504/WaterOnMars2_gcc.jpg

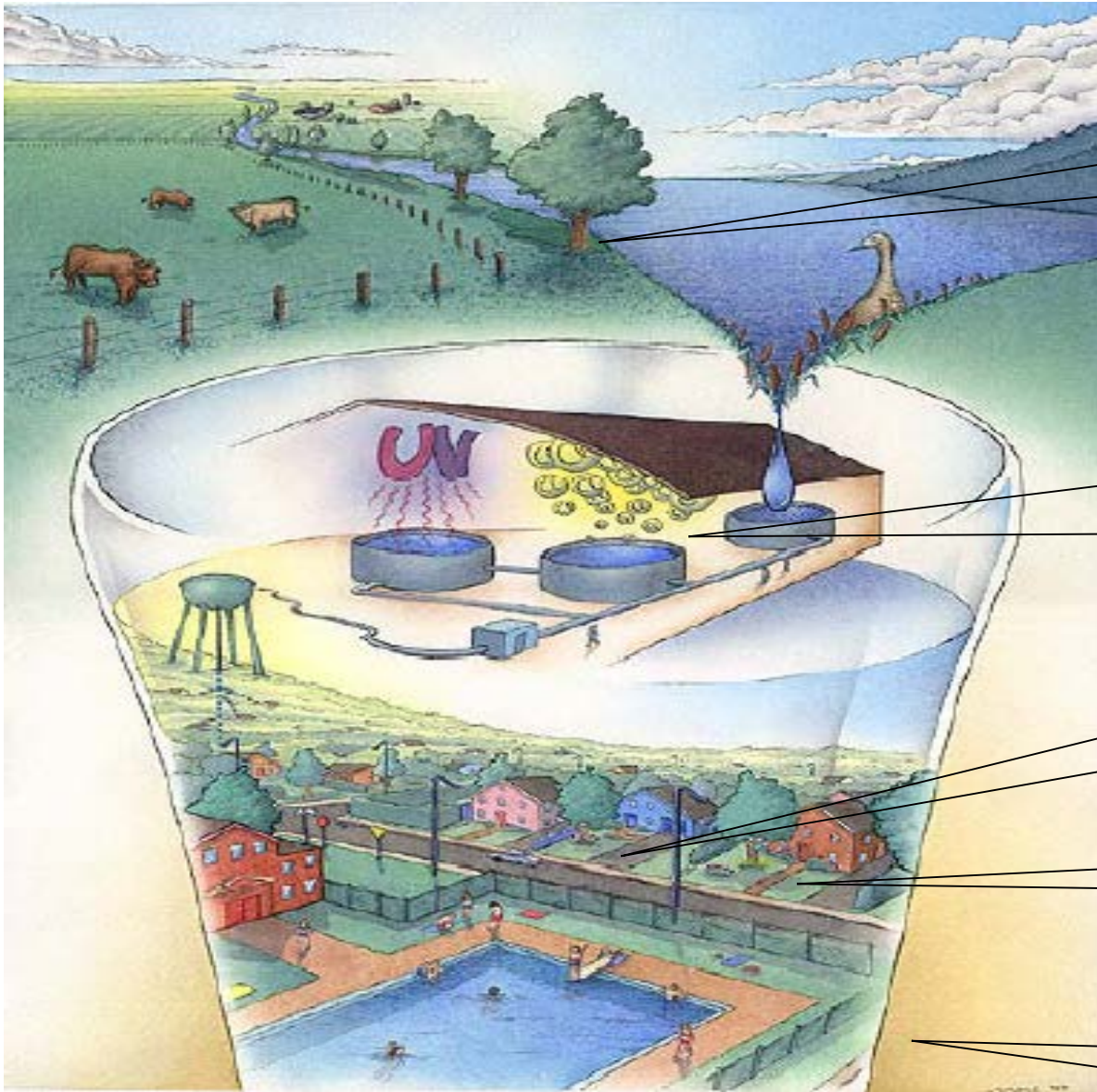
What is Source Water Protection Planning?



Community-based activity aimed at protecting potable water sources (surface and groundwater supplies)

- map water system**
- identify risks to your water system**
- design management actions**
- implement the actions to reduce risks**

Multi-Barrier Approach



1. Source Protection

2. Water treatment

- filtration
- disinfection
- UV

3. Distribution

4. Monitoring

5. Response Plan

Multi-Barrier Approach (First Nation)

From source ...



Well-head

Threats:

- unprotected well heads
- no back-up source
- “Indian lawnmowers”
- agriculture, land uses



Infrastructure



Truck Fill Hose

Threats:

- open access to fill hose
- pipe contamination
- Truck tank disinfection



Water Truck

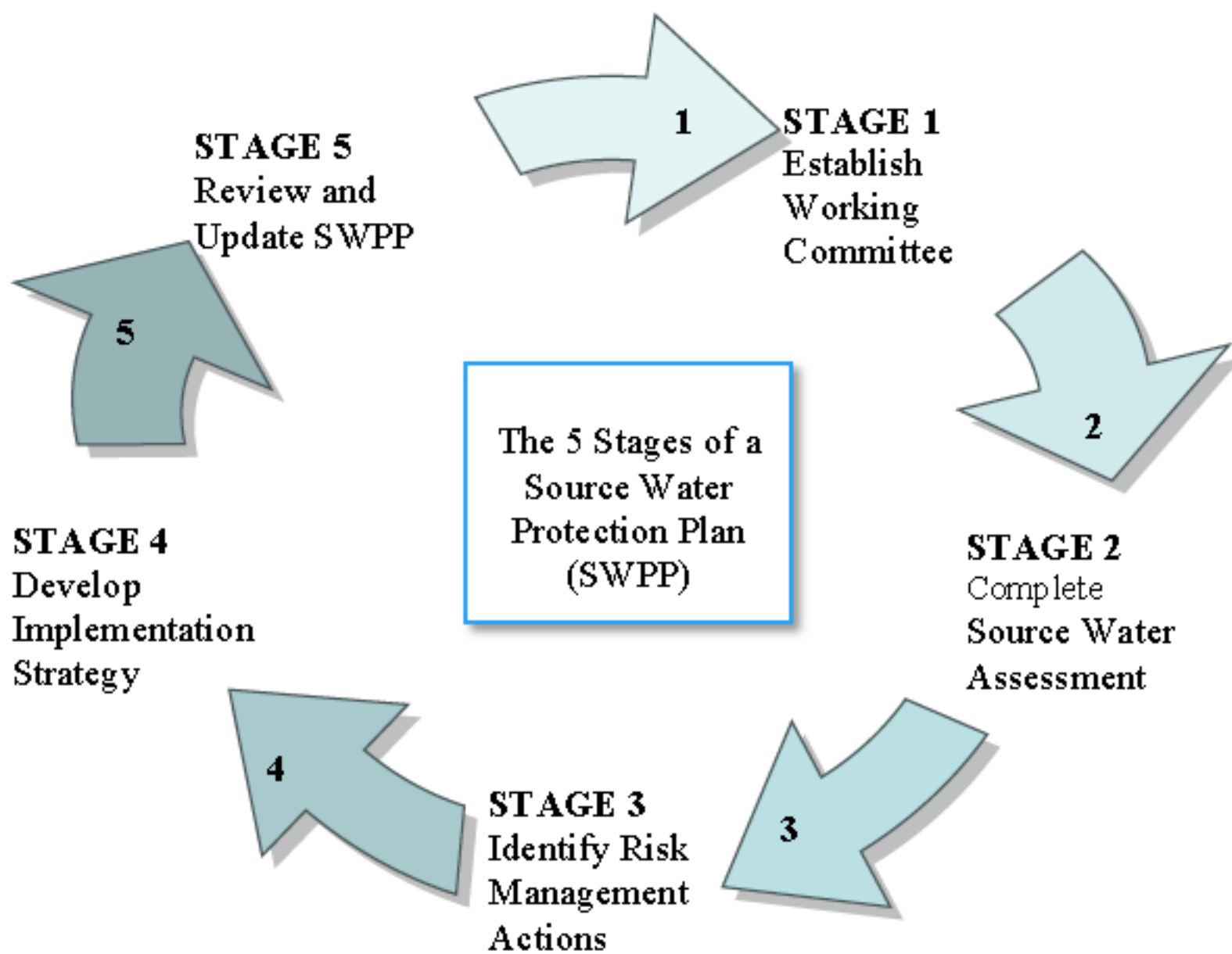
Threats:

- truck hose disinfection
- unsecure cistern cap
- cisterns cracked, contaminated



Water cistern

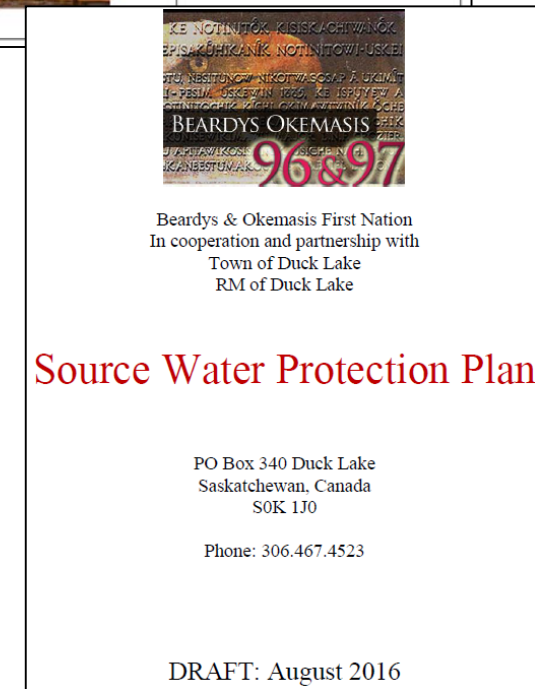
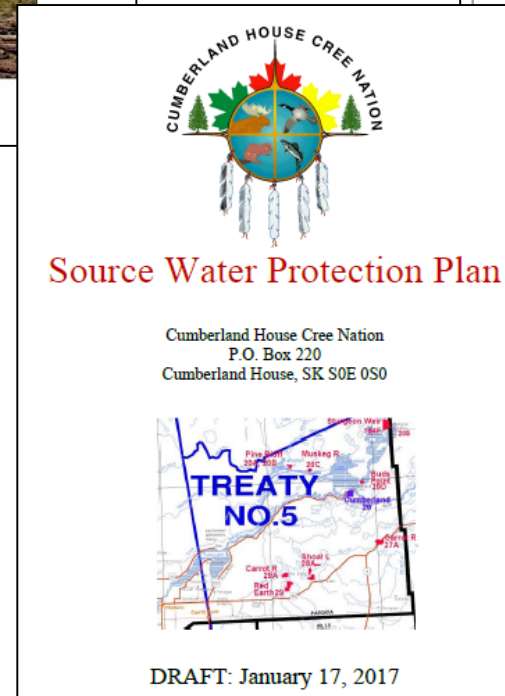
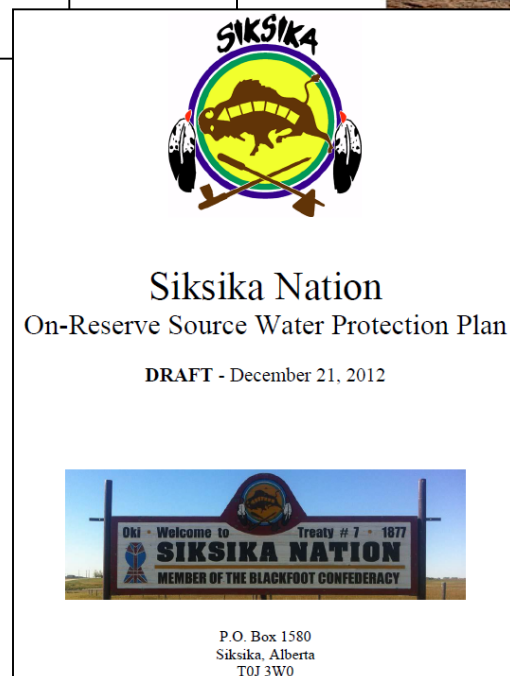
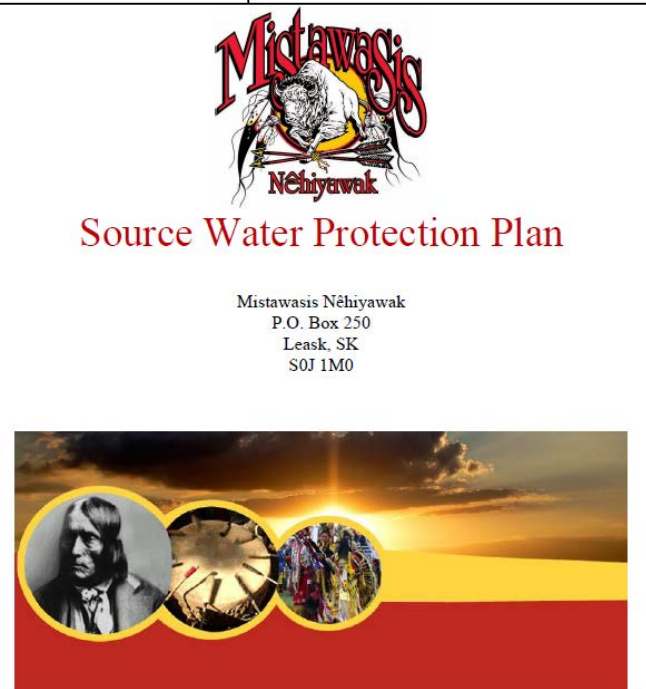
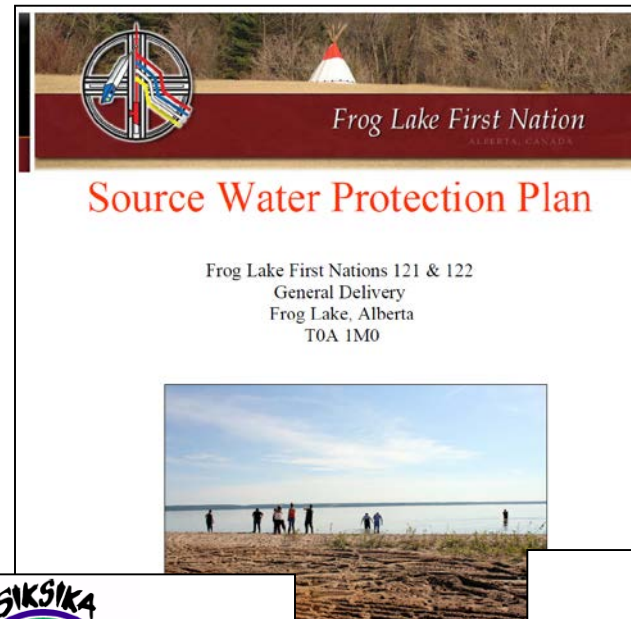
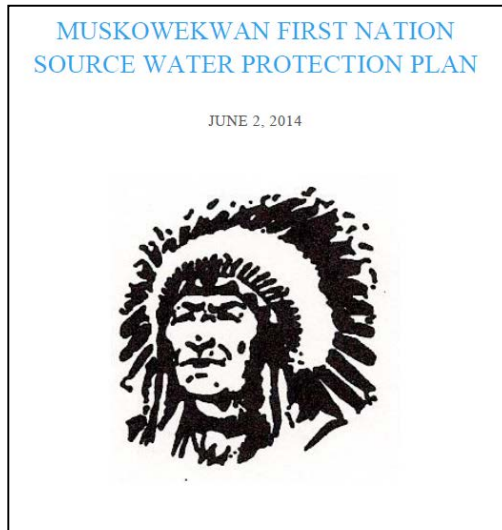
... to tap, almost!



Likelihood **X** Impact = **RISK**

Likelihood of Occurrence	Impact of Occurrence				
	Insignificant 1	Minor 2	Moderate 3	Severe 4	Catastrophic 5
Most Unlikely 1 (in next 4-5 years)	1	2	3	4	5
Unlikely 2 (in next 4-5 years)	2	4	6	8	10
Likely 3 (in next 4-5 years)	3	6	9	12	15
Probable 4 (in next 4-5 years)	4	8	12	16	20
Almost Certain 5 (in next 4-5 years)	5	10	15	20	25

First Nation Source Water Protection Plans



Identify the risk to drinking water source



Barriers of source water protection

- **Human capacity on reserve**
 - Who will be the plan champion?
 - Who will be the implementation champion?
- **Limited control outside reserve boundaries**
 - Agriculture; Rail and road transportation; Airborne contaminants
- **Climate change uncertainty**



Reported highest risks to source water

Sewage lagoons

Illegal dump sites

Uncapped private wells (abandoned)

Agriculture pesticides, fertilizer

Household septic 'shoot-outs'

Cattle/livestock encroaching

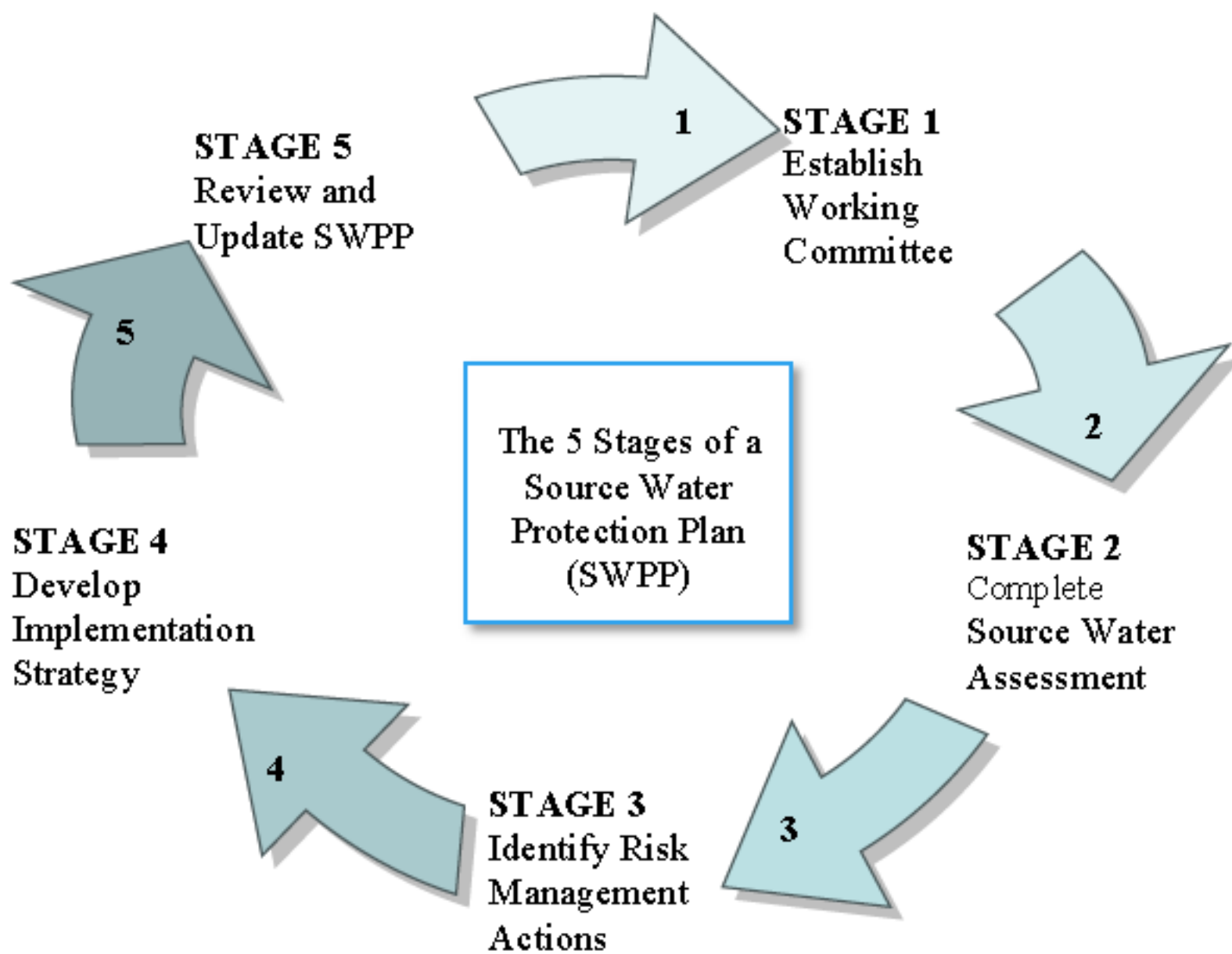
Contaminated industrial land, fuel & material wastes

Solid waste landfills

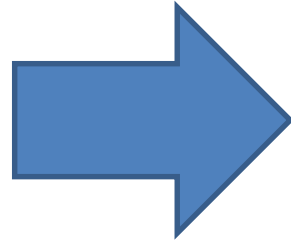
Well-head exposure

Hazardous goods transport

Potable water cisterns



SWP management actions as CC mitigation



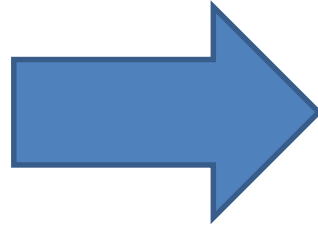
SWP management actions as CC mitigation



SWP management actions as CC mitigation



SWP management actions as CC mitigation



Multi-Barrier Approach (First Nation)

From source ...



Well-head

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Threats:

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Water cistern

... to tap, almost!

“There is no greater medicine than water – it is foundational, our very beginnings, it reminds us where we came from, our first environment in the womb.”

Elder, Chiefs of Ontario 2006

Questions?