

# **Source Water Protection: Implementation Guidelines**



Battle River west of Heisler, AB

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## About This Document

Source water protection is all about protecting our water at the "source". For people living in the Battle River and Sounding Creek watersheds, that means protecting both the quality and quantity of the groundwater that flows beneath our feet and the surface water that flows through the rivers, streams, lakes and wetlands of this region. While engineered solutions such as water treatment are one means of ensuring good water quality in our communities, source water protection moves beyond this to address how our actions on the land impact the quality and quantity of our surface and ground water sources before they even reach our communities.

About 35% of watershed residents rely on surface water sources within the Battle River and Sounding Creek watersheds for their drinking water, while another 35% rely on groundwater sources. The remaining 30% rely on drinking water from outside our watershed, through regional water lines from the Red Deer River and North Saskatchewan River. The BRWA's source water protection efforts will be focused on the 70% of watershed residents who rely on ground and surface water sources within the Battle River and Sounding Creek watersheds.

While source water protection has a major focus on the protection of drinking water sources, we also rely on water for a number of other purposes. Through source water protection, our water sources are also protected for these purposes. And it's not just humans that benefit from the protection of our water sources. The plants, animals and wildlife of our watershed need clean and adequate supplies of water in order to survive, and rivers also require a certain amount of water in order to support healthy aquatic ecosystems. The health of ourselves, our communities, and our watershed as a whole depends on the protection of our water sources.

That is why source water protection is one component of the BRWA's watershed management planning (WMP) process. For more information about this process, see page 20. The following document outlines the BRWA's implementation guidelines for source water protection in the Battle River and Sounding Creek watersheds in Alberta.

This advice was developed with broad input from watershed residents, stakeholders and decision-makers<sup>1</sup>, and is supported by information compiled in the BRWA's *Understanding the Policy Context for Source Water Protection in the Battle River and Sounding Creek Watersheds* report<sup>2</sup>. Reference information from this report is provided for select guidelines on page 18.

## Accompanying Policy Advice

This implementation guidelines document is accompanied by a corresponding policy advice document<sup>3</sup>. Whereas the policy advice document puts forward an overarching policy direction for source water protection, this implementation guidelines document describes options for management strategies aimed at supporting the implementation of that policy direction.

## Guideline Purpose

The purpose of this implementation guidelines document is to provide recommendations for management actions that may be implemented to support the protection of the quality and quantity of source waters in the Battle River and Sounding Creek watersheds.

## Guideline Objectives

This document seeks to support source water protection planning in the Battle River and Sounding Creek watersheds through:

- outlining the steps to be used in developing, implementing, monitoring and evaluating source water protection plans for the region,
- providing guidance on important region and watershed specific considerations to be incorporated into source water protection plans,
- describing areas where further research is required, and
- supporting regulatory discretion and adaptation to local and regional circumstances in source water protection planning

## Guideline Application

These implementation guidelines apply to the Battle River and Sounding Creek watersheds within Alberta, and are intended for all residents, stakeholders and decision-makers within these watersheds. This includes all four orders of government (municipal, provincial, federal and First Nations), urban and rural residents, agricultural producers, business and industry, environmental and community organizations, academia and watershed stewardship groups. See page 21 for a map of these watersheds.

The BRWA's WMP process is non-regulatory. This means that implementation of the policy advice and implementation guidelines developed for each of the BRWA's 12 watershed management priority areas is dependent on the voluntary actions of watershed residents, stakeholders and decision-makers. In addition, implementation of these recommendations is based on an adaptive management approach. The BRWA recognizes that we do not have a complete understanding of the natural and social systems functioning within the Battle River and Sounding Creek watersheds. Implementation actions are viewed as experiments that may or may not result in the desired outcomes; lessons learned through these experiments allow us to collectively improve watershed management approaches over time.

The BRWA will work to support the implementation of policies and management practices that align with the goals and objectives outlined in this document.

## Implementation Guidelines

### 1 Source Water Protection Planning

*Source water protection planning is the key mechanism through which drinking water sources may be protected in the Battle River and Sounding Creek watersheds.*

#### Policy Objective:

Source water protection plans should be developed for the entirety of the Battle River and Sounding Creek watersheds in Alberta, with separate plans being developed for surface water and groundwater.

These plans should:

- protect the quality and quantity of ground and surface water sources
- identify appropriate management actions that should be taken to minimize or eliminate risks identified through source water risk assessments, and
- outline an implementation strategy to support management efforts.

Source water protection planning should be led by a designated lead agency and undertaken as a collaborative effort by all stakeholder groups.

#### Implementation Guidelines:

Guideline	Responsibility
<p><b>1.1:</b> Municipal and First Nations governments should lead source water protection planning efforts in their jurisdictions.</p> <p><i><b>Rationale:</b> Municipal and First Nations governments have an in-depth knowledge of local and regional drinking water systems and associated risks, challenges and opportunities. Source water protection planning is also an important component of municipal Drinking Water Safety Plans.</i></p>	<ul style="list-style-type: none"> <li>• Municipal governments</li> <li>• First Nations governments</li> </ul>
<p><b>1.2:</b> The Battle River Watershed Alliance should support and facilitate source water protection planning efforts in the Battle River and Sounding Creek watersheds.</p> <p><i><b>Rationale:</b> Because source water protection planning may cross jurisdictional boundaries, it is important to have a coordinating body to facilitate collaborative planning efforts in the Battle River and Sounding Creek watersheds. The Battle River Watershed Alliance is well-positioned to fill this role.</i></p>	<ul style="list-style-type: none"> <li>• Battle River Watershed Alliance</li> </ul>

Guideline	Responsibility
<p><b>1.3:</b> Multi-stakeholder working committees should be organized to lead the development of source water protection plans within the Battle River and Sounding Creek watersheds.</p> <p><i><b>Rationale:</b> Multi-stakeholder working committees ensure that the diversity of perspectives of watershed stakeholders are incorporated into source water protection plans.</i></p>	<ul style="list-style-type: none"><li>• Municipal governments</li><li>• First Nations governments</li><li>• Battle River Watershed Alliance</li><li>• Watershed stakeholders</li></ul>

## 2 Geographic Area of Source Water Protection Plans

*An important first step in developing source water protection plans is to delineate the planning boundaries.*

### Policy Objective for Surface Water:

The planning boundaries for source water protection plans focused on surface water should be delineated based on the drinking water intake locations for Wetaskiwin, Camrose, and Wainwright. Planning efforts should focus on the effective drainage area of the watershed.

### Implementation Guidelines for Surface Water:

Guideline	Responsibility
<p><b>2.1:</b> The Battle River and Sounding Creek watersheds should be divided into five surface source water protection planning areas:</p> <ol style="list-style-type: none"> <li>the watershed upstream of Wetaskiwin's drinking water intake,</li> <li>the watershed upstream of Camrose's drinking water intake, excluding the area covered in 1)</li> <li>the watershed upstream of Wainwright's drinking water intake, excluding the area covered in 1) and 2)</li> <li>the watershed downstream of Wainwright's drinking water intake to the Saskatchewan border</li> <li>the Sounding Creek watershed</li> </ol> <p>Surface source water protection efforts will focus on the effective drainage area within these watershed boundaries.</p> <p><b><i>Rationale:</i></b> <i>Wetaskiwin, Camrose and Wainwright are the three communities that draw their water directly from surface water sources within the Battle River watershed. Source water protection plans should consider the entire watershed upstream of the source water intake.</i></p>	<ul style="list-style-type: none"> <li>Battle River Watershed Alliance</li> </ul>
<p><b>2.2:</b> Municipal or First Nations governments may choose to develop surface source water protection plans specific to their community or region. Such plans should be incorporated as sub-regional plans within the broader source water protection planning efforts for the watershed.</p> <p><b><i>Rationale:</i></b> <i>A regional approach may present jurisdictional challenges for municipal and First Nations governments. In addition, some surface water protection effects may be addressed most effectively at the local scale. As such, some groups may prefer to develop a surface source water protection plan specific to their jurisdictional boundaries.</i></p>	<ul style="list-style-type: none"> <li>Municipal governments</li> <li>First Nations governments</li> <li>Battle River Watershed Alliance</li> </ul>



### Policy Objective for Groundwater:

The planning boundaries for source water protection plans focused on groundwater should be delineated according to municipal and First Nations boundaries.

Guideline	Responsibility
<p><b>2.3:</b> All groundwater protection plans should take into consideration:</p> <ul style="list-style-type: none"> <li>a. the Government of Alberta's Aquifer Vulnerability Index,</li> <li>b. Private and public wellhead locations, and</li> <li>c. Significant groundwater recharge and discharge areas</li> </ul> <p>Additional metrics for identifying priority groundwater protection areas may be added as new information becomes available.</p> <p><i><b>Rationale:</b> The Aquifer Vulnerability Index is a province-wide method for assessing the vulnerability of aquifers to surface contaminants. Wellhead protection areas may be utilized to protect individual wellheads. Groundwater recharge and discharge areas are important points of connectivity between ground and surface water.</i></p>	<ul style="list-style-type: none"> <li>• Municipal governments</li> <li>• First Nations governments</li> <li>• Battle River Watershed Alliance</li> <li>• Watershed stakeholders</li> </ul>
<p><b>2.4:</b> Municipal or First Nations governments may choose to develop groundwater protection plans specific to their jurisdictional boundaries, or work collaboratively at a regional scale. Both approaches are acceptable and all plans developed will be incorporated within the broader source water protection planning efforts for the watershed.</p> <p><i><b>Rationale:</b> Some groundwater protection efforts may be undertaken most effectively at the local scale. However, other efforts may benefit from a more collaborative regional approach. Municipal and First Nations governments should be given the flexibility to approach groundwater protection planning in the manner most suitable to their circumstances.</i></p>	<ul style="list-style-type: none"> <li>• Municipal governments</li> <li>• First Nations governments</li> <li>• Battle River Watershed Alliance</li> </ul>



### 3 Source Water Risk Assessments

*A source water risk assessment is a key component of any source water protection plan. First, it is important to have a good understanding of the natural features and hydrology of the watershed, the various land uses and activities taking place within the planning area, and the geographic distribution of these activities. Risks to source waters may then be identified and assessed for their potential impacts.*

#### Policy Objective:

Within each source water protection planning area, the watershed should be characterized, public water sources and systems inventoried, and a risk assessment conducted to assess all risks to source water quality and quantity.

#### Implementation Guidelines:

Guideline	Responsibility
<p><b>3.1:</b> A detailed characterization of each source water protection planning area should be conducted, which may include information on:</p> <ul style="list-style-type: none"> <li>▪ natural regions and subregions,</li> <li>▪ vegetative land cover,</li> <li>▪ effective drainage area of the watershed,</li> <li>▪ environmentally significant areas, parks, and protected areas,</li> <li>▪ water quality of the Battle River and its tributaries,</li> <li>▪ groundwater quality, recharge and discharge areas, recharge rates, and vulnerable areas,</li> <li>▪ distribution and density of oil and gas wells, gravel mines, water wells, freshwater springs,</li> <li>▪ distribution of surface water and groundwater licenses and registrations and volume of water allocated,</li> <li>▪ linear developments (roads, powerlines, pipelines, etc.),</li> <li>▪ urban development (area covered, land uses, stormwater management practices, etc.),</li> <li>▪ agricultural land uses and associated management practices,</li> <li>▪ industrial and commercial land uses,</li> <li>▪ population density and distribution,</li> <li>▪ waste water treatment facilities, and</li> <li>▪ the location of monitoring wells</li> </ul> <p><b>Rationale:</b> Various land use activities may present risks to source waters.</p>	<ul style="list-style-type: none"> <li>• Source water protection working committees, in conversation with the broader watershed community</li> </ul>

Guideline	Responsibility
<p><b>3.2:</b> A detailed inventory of all public water sources and systems should be developed for each source water protection planning area. The inventory may include information on:</p> <p><u>Surface water sources:</u></p> <ul style="list-style-type: none"> <li>▪ the location of the source water, and whether or not a backup source is available</li> <li>▪ intake location, date of construction, frequency of intake inspection</li> <li>▪ whether or not: <ul style="list-style-type: none"> <li>○ intake is screened</li> <li>○ an intake protection zone is in place</li> <li>○ a backup intake is available</li> </ul> </li> <li>▪ population served by source water</li> <li>▪ whether or not raw water is monitored (and if it is, what parameters are monitored, and how frequently?)</li> <li>▪ water treatment type</li> </ul> <p><u>Groundwater sources:</u></p> <ul style="list-style-type: none"> <li>▪ well details, including: well depth, whether water is from a confined or unconfined aquifer, depth to bedrock, depth of casing</li> <li>▪ whether or not: <ul style="list-style-type: none"> <li>○ wellhead seal is secure and in good condition</li> <li>○ wellhead access is controlled (via well house, fence, locked cap, or otherwise)</li> <li>○ wellhead is enclosed by a well house <ul style="list-style-type: none"> <li>▪ if not, is there a permanent grass buffer at least 3 meters around well?</li> </ul> </li> <li>○ surface water pools around well</li> <li>○ well casing extends at least 0.3 meters above ground</li> <li>○ there is hazardous material stored in the well house</li> <li>○ a wellhead protection zone is in place</li> </ul> </li> </ul> <p><b><i>Rationale:</i></b> A detailed understanding of water sources and systems is required to adequately protect those sources and systems.</p>	<ul style="list-style-type: none"> <li>• Source water protection working committees, in conversation with the broader watershed community</li> </ul>

Guideline	Responsibility
<p><b>3.3:</b> Risks to source water should be identified within each source water protection planning area. Important considerations include:</p> <ul style="list-style-type: none"> <li>▪ potential impact of drought on water supply</li> <li>▪ potential impact of climate change on water supply</li> <li>▪ the extent of ground and surface water allocations in the watershed and potential effect of current and future water use on water supply</li> <li>▪ connectivity between ground and surface water, and the potential for surface water to contaminate groundwater (and vice versa)</li> <li>▪ vulnerable areas (<i>see related recommendation 3.4</i>)</li> </ul> <p>Key considerations for potential contamination sources include:</p> <ul style="list-style-type: none"> <li>▪ abandoned oil and gas wells</li> <li>▪ abandoned water wells</li> <li>▪ waste water treatment plants, sewage lagoons, sewage outfall locations, and private septic systems</li> <li>▪ landfills and other waste deposits</li> <li>▪ agricultural activities</li> <li>▪ erosion, flooding and other natural factors</li> <li>▪ industrial and commercial land uses</li> <li>▪ urban development and associated stormwater runoff</li> </ul> <p><b><i>Rationale:</i></b> When risks to source water are identified, management actions may then be taken to manage those risks.</p>	<ul style="list-style-type: none"> <li>• Source water protection working committees, in conversation with the broader watershed community</li> </ul>
<p><b>3.4:</b> In addition to risks identified for the general source water protection planning area, source water risks should be identified within these specific vulnerable areas: wellhead protection areas, intake protection zones, highly vulnerable aquifers, significant groundwater recharge areas, and the effective drainage area of the watershed.</p> <p>General definitions of these areas are outlined below. A detailed process for delineating these areas should be developed. The Government of Ontario's <i>Technical Rules: Assessment Report</i><sup>4</sup> may provide a valuable resource in undertaking this work.</p> <p><i>Wellhead protection areas:</i> area around water wells where particular source water protection management actions are undertaken. Size of wellhead protection area will be</p>	<ul style="list-style-type: none"> <li>• Source water protection working committees, in conversation with the broader watershed community</li> </ul>

Guideline	Responsibility
<p>dependent on a number of factors, including surface water flow in the vicinity of the well, population served by well, etc.). Additional research is required to identify appropriate wellhead protection areas for groundwater wells in the Battle River and Sounding Creek watersheds.</p> <p><i>Intake protection zones:</i> area around surface water intake locations where particular source water protection management actions are undertaken. Size of intake protection zone will be dependent on a number of factors, including the location and type of intake and surface water flow in the vicinity of the intake location. Additional research is required to identify appropriate intake protection zones for the types of intakes utilized in the Battle River and Sounding Creek watersheds.</p> <p><i>Highly vulnerable aquifers:</i> aquifers that fall within the “high” vulnerability category of the Government of Alberta’s Aquifer Vulnerability Index for the Agricultural Area of Alberta</p> <p><i>Significant groundwater recharge areas:</i> recharge areas where the distance of the potentiometric surface above the land surface is greatest (additional groundwater mapping is required to define the distance above which a recharge area is considered “significant”). Recharge rates should also be taken into consideration in identifying significant recharge areas.</p> <p><i>Effective drainage area:</i> that portion of the watershed that might be expected to entirely contribute runoff to the main stream during a flood with a return period of two years.</p> <p><b><i>Rationale:</i></b> Vulnerable areas may require additional management actions in order to adequately protect source water.</p>	

Guideline	Responsibility
<p><b>3.5:</b> Once risks are identified, a risk matrix should be used to assign risk scores representing the likelihood and impact of each risk occurring. Risk scores should be assigned according to the values used in the Government of Alberta's Drinking Water Safety Plan risk matrix template. See reference information on page 18 for a detailed description of this template.</p> <p><i><b>Rationale:</b> Risk matrices are valuable in determining the relative risk of each potential threat to source water. Management actions may then be prioritized accordingly. By using the same valuation system as that used in Alberta's Drinking Water Safety Plans, synergies between these two initiatives may be realized.</i></p>	<ul style="list-style-type: none"> <li>• Source water protection working committees, in conversation with the broader watershed community</li> </ul>
<p><b>3.6:</b> Source water protection actions should be identified to manage each risk identified through the risk assessment.</p> <p><i><b>Rationale:</b> These management actions comprise the Source Water Protection Plan for a given planning area.</i></p>	<ul style="list-style-type: none"> <li>• Source water protection working committees, in conversation with the broader watershed community</li> </ul>
<p><b>3.7:</b> Source water risks and associated management actions identified through municipal Drinking Water Safety Plans should be incorporated into Source Water Protection Plans.</p> <p><i><b>Rationale:</b> Drinking Water Safety Plans provide valuable information about local source water risks and place-based management solutions.</i></p>	<ul style="list-style-type: none"> <li>• Municipal governments</li> </ul>

## 4 Implementation of Source Water Protection Plans

*Implementation of source water protection actions is the primary goal of source water protection planning efforts.*

### Policy Objective:

Once source water protection plans are developed, the lead agency and regional Watershed Planning and Advisory Council should support stakeholders in implementing management actions identified in the plans.

Guideline	Responsibility
<p><b>4.1:</b> The implementation strategy developed to lead source water management efforts should outline: the stakeholders involved in completing each management action, the timeline within which each action should be completed, and resources required to implement each action.</p> <p><i><b>Rationale:</b> Outlining who is responsible for management actions and the time frame in which those actions should occur is essential to the successful implementation of source water protection plans.</i></p>	<ul style="list-style-type: none"> <li>• Source water protection working committees, in conversation with the broader watershed community</li> </ul>
<p><b>4.2:</b> Management actions for high priority risks should focus on ensuring that the risk to source waters is reduced or eliminated. Management actions for medium to low priority risks should focus on ensuring that those risks do not become a more significant threat to source waters. Management actions may also include a focus on education, outreach and incentive programs designed to bring attention to potential risks to source water and encourage actions that minimize these risks.</p> <p><i><b>Rationale:</b> A range of different management actions are required to address the variety of source water risks that exist.</i></p>	<ul style="list-style-type: none"> <li>• Source water protection working committees, in conversation with the broader watershed community</li> </ul>
<p><b>4.3:</b> Educational efforts should be undertaken to raise awareness about source water protection, source water protection planning efforts, local and regional risks to water sources, and management actions that may be taken to minimize those risks.</p> <p><i><b>Rationale:</b> Education is important in increasing knowledge about source water protection. When people are more aware of risks to water sources in their region, they are better equipped to undertake actions to minimize those risks.</i></p>	<ul style="list-style-type: none"> <li>• Environmental educators and organizations</li> <li>• Battle River Watershed Alliance</li> <li>• Municipal, provincial, federal and First Nations governments</li> </ul>

Guideline	Responsibility
<p><b>4.4:</b> Source water protection efforts should utilize and build upon existing programs that encourage source water protection in Alberta (e.g. Working Well program, the Alberta Environmental Farm Plan, Growing Forward 2).</p> <p><i><b>Rationale:</b> Many local, regional and provincial initiatives are already working towards source water protection in Alberta, whether it be through education, incentive programs, or otherwise. These initiatives should be utilized to achieve the goals set out in source water protection plans in the Battle River and Sounding Creek watersheds of Alberta.</i></p>	<ul style="list-style-type: none"> <li>• Implementers of source water protection actions</li> </ul>

Any number of management actions may be undertaken to reduce risks to source water. The following list provides a preliminary overview of management actions that may be beneficial in the Battle River and Sounding Creek watersheds:

- Vulnerable areas should be identified and special management actions undertaken in these areas. Vulnerable areas may include: groundwater recharge areas, natural springs, highly vulnerable aquifers, and areas around wellheads and surface water intake locations.
- Unmaintained or poorly constructed water wells should be upgraded or decommissioned.
- Active oil and gas wells should be adequately maintained, and abandoned wells should be properly decommissioned.
- Private sewage disposal systems should be inspected and maintained on a regular basis and repaired or upgraded as necessary. Where regional waste water systems are available, residents should be required to connect to these systems. The BRWA has also developed additional recommendations for management of private septic systems<sup>5</sup>.
- Potential improvements to urban wastewater treatment should be explored.
- The provincial government should ensure that there are no impacts to drinking water sources as a result of resource extraction activities (especially related to open pit mining and hydraulic fracturing)
- Urban and rural beneficial management practices (BMPs) to reduce non-point source (NPS) pollution should be undertaken. The BRWA has developed detailed implementation guidelines for NPS pollution management<sup>5</sup>.



## 5 Monitoring and Evaluation

*Actions implemented as a result of source water protection plans must be monitored and evaluated in order to determine their effectiveness in achieving the desired outcomes.*

### Policy Objective:

A monitoring and evaluation program should be developed in order to evaluate the effectiveness of all source water protection plans developed.

### Implementation Guidelines:

Guideline	Responsibility
<p><b>5.1:</b> Once a source water protection plan is completed, it should be reviewed on a regular basis (every 5 years) to ensure that the recommendations are still relevant and appropriate.</p> <p><i><b>Rationale:</b> Some recommendations may prove to be inappropriate or inadequate to deal with source water risks. New developments may present new risks to source water. It is important to keep source water protections plan up-to-date to account for new information and lessons learned through plan implementation.</i></p>	<ul style="list-style-type: none"> <li>Source water protection working committees, in conversation with the broader watershed community</li> </ul>
<p><b>5.2:</b> Progress in implementing the management actions laid out in the plan should be monitored.</p> <p><i><b>Rationale:</b> It is important to ensure that management actions are carried out in the specified time frame. Where implementation is slow or stalled, additional resources or actions may be required to support plan implementation.</i></p>	<ul style="list-style-type: none"> <li>Source water protection working committees</li> </ul>
<p><b>5.3:</b> Management actions that have been implemented should be evaluated for their effectiveness in minimizing risks to source water. Where management actions prove ineffective, alternative actions should be applied in order to achieve the desired outcomes.</p> <p><i><b>Rationale:</b> It is important to recognize when management actions are not achieving the desired outcomes so that alternative approaches may be implemented to ensure source water protection.</i></p>	<ul style="list-style-type: none"> <li>Source water protection working committees</li> </ul>

## 6 Research for Source Water Protection Planning

*Additional research is required in order to strengthen source water protection planning efforts in the Battle River and Sounding Creek watersheds.*

### Policy Objective:

Research should be undertaken in order to support the development of source water protection plans in the Battle River and Sounding Creek watersheds.

Research needs include delineating groundwater aquifer boundaries, gathering data required to characterize the planning area and conduct risk assessments, and increasing understanding of regional groundwater systems and their interactions with surface water systems.

### Implementation Guidelines:

Guideline	Responsibility
<p><b>6.1:</b> Research should be undertaken to delineate the boundaries of groundwater aquifers in the Battle River and Sounding Creek watersheds.</p> <p><i><b>Rationale:</b> A more in-depth understanding of groundwater aquifer boundaries will support the development of source water protection plans that fully take into consideration groundwater systems.</i></p>	<ul style="list-style-type: none"> <li>Government of Alberta</li> </ul>
<p><b>6.2:</b> Research should be undertaken to identify groundwater recharge and discharge areas and determine groundwater recharge rates in the Battle River and Sounding Creek watersheds.</p> <p><i><b>Rationale:</b> Groundwater recharge and discharge areas are important points of connectivity between ground and surface water systems. An understanding of groundwater recharge rates is essential to determining the sustainable use of groundwater and the location of significant groundwater recharge areas.</i></p>	<ul style="list-style-type: none"> <li>Government of Alberta</li> </ul>
<p><b>6.3:</b> Data-sharing (especially of GIS data layers) should be encouraged in order to support source water protection planning efforts in the Battle River and Sounding Creek watersheds.</p> <p><i><b>Rationale:</b> Access to a number of data sets is essential to the characterization of source water protection planning areas in the Battle River and Sounding Creek watersheds. Appropriate management actions are dependent on this detailed understanding of the various factors at play in the planning area.</i></p>	<ul style="list-style-type: none"> <li>Any organization/institution with relevant watershed data</li> <li>Battle River Watershed Alliance</li> <li>Municipal, provincial, federal and First Nations governments</li> <li>Industry</li> </ul>

## Reference Information for Select Guidelines

The following table outlines reference information for select guidelines. All reference information is found in the BRWA report: *Understanding the Policy Context for Source Water Protection in the Battle River and Sounding Creek Watersheds*<sup>2</sup>.

Guideline	Reference Information
1.1, 1.2: Lead agency designation 1.3: Working committee designation	Section 5.1 (page 12-13)
2.1, 2.3: Source water protection planning areas 2.2, 2.4: Sub-regional source water protection plans	Section 5.2 (page 13-18)
3.1: Watershed characterization 3.2: Inventory of drinking water sources and systems 6.1: Delineating boundaries of groundwater aquifers 6.2: Identifying groundwater recharge and discharge areas and groundwater recharge rates	Section 5.3.1 (page 19-21)
3.3: Identifying risks to source water 3.4: Identifying risks within vulnerable areas 3.5: Utilizing a risk matrix to assess relative risk	Section 5.3.2 (page 21-26)
3.7: Drinking Water Safety Plans 4.1: Source water protection plan implementation strategy 4.2: Management actions for high, medium and low priority risks	Section 5.4 (page 27)
5.1: Source water protection plan review 5.2: Management action progress 5.3: Management action effectiveness	Section 5.5 (page 27-29)
4.4: Existing source water protection programs	Section 6.1.1 (page 29-31)

## About the Battle River Watershed Alliance

The Battle River Watershed Alliance (BRWA) was created in 2006 as a non-profit society. Shortly after its formation, the BRWA was selected by Alberta Environment, under *Water for Life: Alberta's Strategy for Sustainability*<sup>6</sup>, as the designated Watershed Planning and Advisory Council (WPAC) for the Battle River and Sounding Creek watersheds within Alberta. See page 21 for a map of the Alberta portions of these watersheds.

Under Alberta's *Water for Life* strategy, WPACs have a role to report on the state of the watershed, lead in watershed planning, develop best management practices, educate users of the water resource and foster stewardship activities within the watershed.

The BRWA works in partnership with communities, individual watershed residents, watershed stewardship groups, all four orders of government (municipal, provincial, federal and First Nations), industry, academia, and environmental organizations to promote the health and sustainable management of the land and water resources of the Battle River and Sounding Creek watersheds using the best science and social science available.

We exist to have a watershed that sustains all life by using sound knowledge, wisdom, and wise actions to preserve our watershed for future generations.

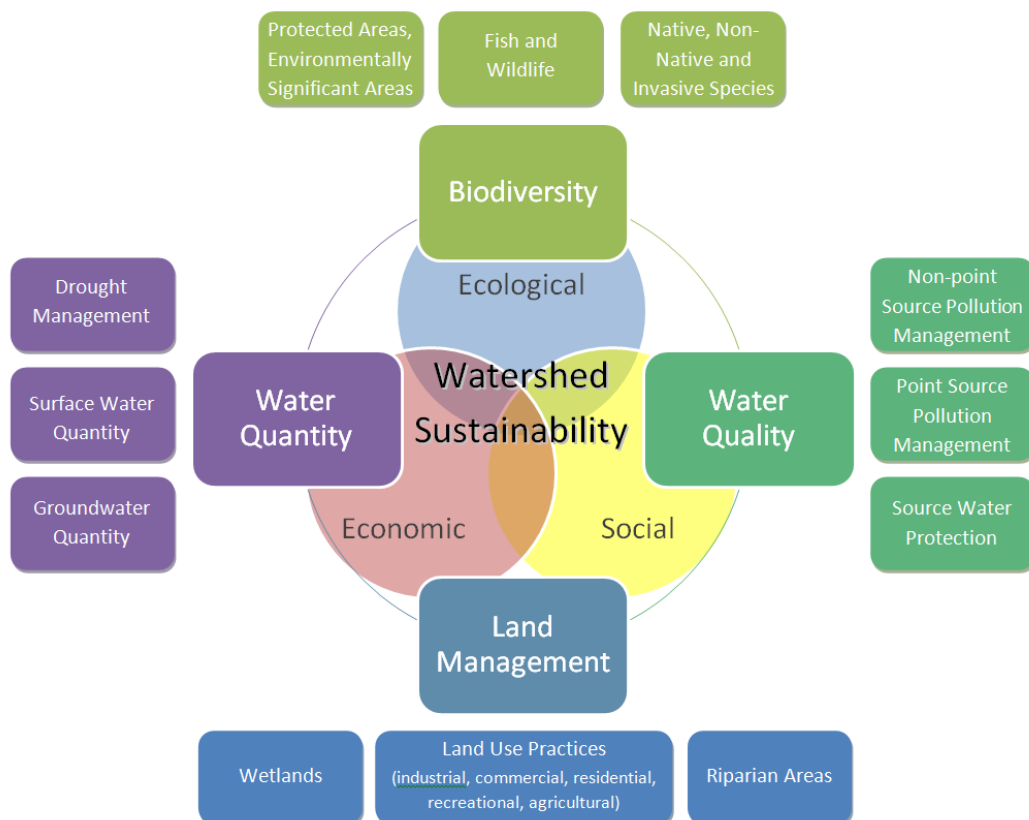
## About BRWA's Watershed Management Planning Process

As the provincially designated Watershed Planning and Advisory Council (WPAC) for the Battle River and Sounding Creek watersheds within Alberta, the BRWA has a role to lead in watershed planning.

The BRWA's Watershed Management Planning Process was initiated in 2011. This planning process will ultimately result in a comprehensive Watershed Management Plan for the Battle River and Sounding Creek watersheds in Alberta, and is guided by the *Battle River Watershed Management Planning Process Phase Two Terms of Reference*<sup>7</sup>.

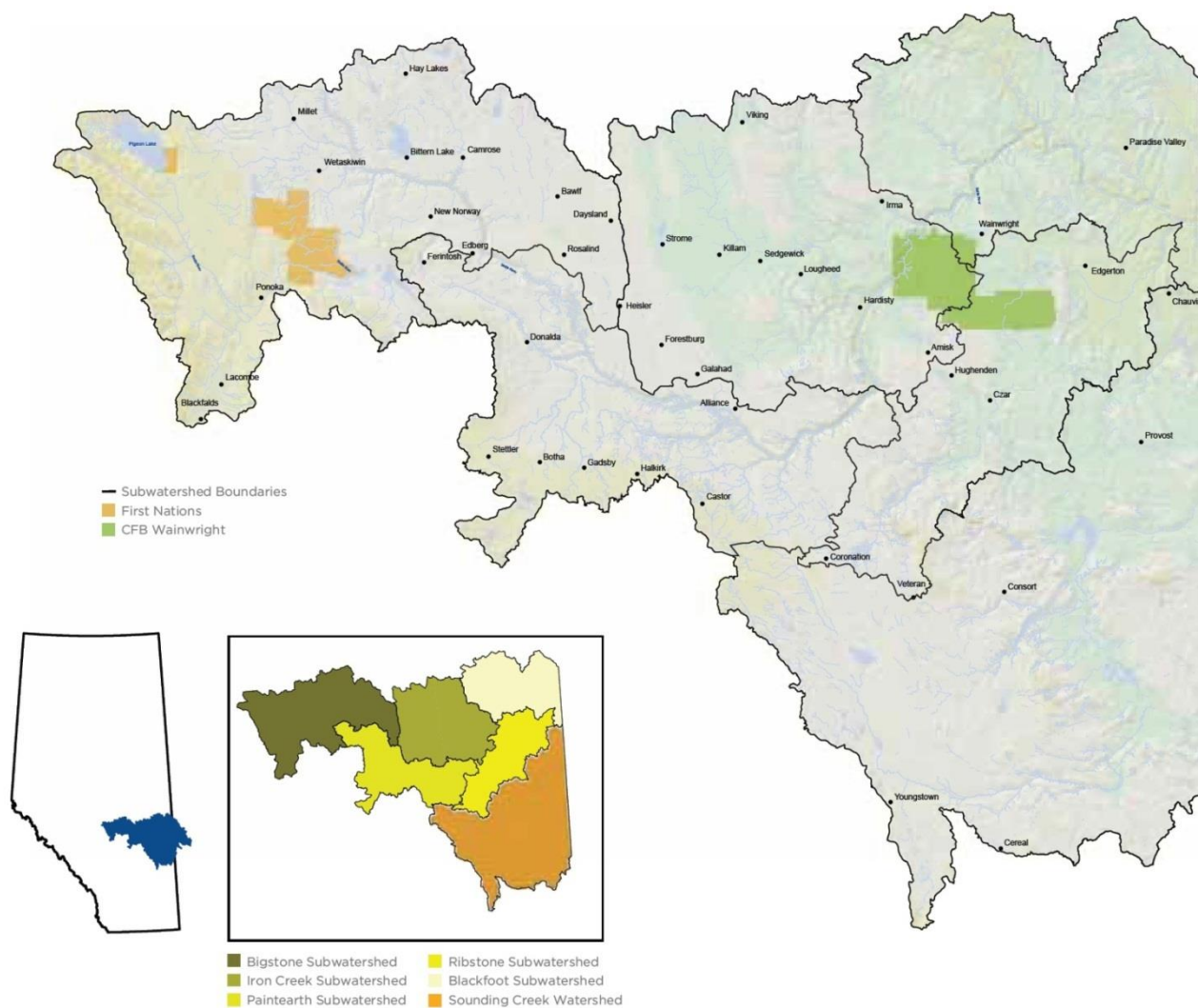
The Watershed Management Planning Process will address a number of watershed management priorities that have been identified through the BRWA's 2011 State of the Watershed Report<sup>8</sup> and extensive public engagement. These priorities are outlined in the figure below.

Policy advice and implementation guidelines will be developed for each of these priority areas. These documents will comprise the Watershed Management Plan for the Battle River and Sounding Creek watersheds in Alberta.



**Key components of the BRWA's Watershed Management Planning Process**

## Battle River and Sounding Creek Watersheds within Alberta



## Endnotes

- <sup>1</sup> Battle River Watershed Alliance (BRWA). 2014a. *Source Water Protection: What We Heard*. BRWA Public Engagement Report, 27 pages.
- <sup>2</sup> Battle River Watershed Alliance (BRWA). 2014b. *Understanding the Policy Context for Source Water Protection in the Battle River and Sounding Creek Watersheds*. BRWA Watershed Planning Document, 42 pages.
- <sup>3</sup> Battle River Watershed Alliance (BRWA). 2014c. *Source Water Protection: Policy Advice*. BRWA Watershed Planning Document, 10 pages.
- <sup>4</sup> Government of Ontario. 2009. *Technical Rules: Assessment Report (Clean Water Act, 2006)*. 65 pages.
- <sup>5</sup> Battle River Watershed Alliance (BRWA). 2013. *Non-point Source Pollution Management: Implementation Guidelines (Nutrient Management Focus)*. BRWA Watershed Planning Document, 31 pages.
- <sup>6</sup> Government of Alberta. 2003. *Water for Life: Alberta's Strategy for Sustainability*. 31 pages.
- <sup>7</sup> Battle River Watershed Alliance (BRWA). 2012. *Battle River Watershed Management Planning Process Phase Two Terms of Reference*. Battle River Watershed Alliance Watershed Planning Report, 36 pages.
- <sup>8</sup> Battle River Watershed Alliance (BRWA). 2011. *State of the Battle River and Sounding Creek Watersheds Report 2011*. Battle River Watershed Alliance, 64 pages.



**This is our battle: the watershed we all share, and the fight to maintain a healthy environment, vibrant communities and a stable economy.**

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**Connecting People to Place for Action**



Tipis at the Battle Lake 4H Centre