8. Stakeholder Engagement

Stakeholder engagement is an essential part of water stewardship, because it involves reaching beyond the fence-line of the site and understanding the concerns, needs and interests of the stakeholders in the area. Stakeholders of the implementers site are groups or entities of people that can be affected by the implementer's activities.

8.1 Identifying Stakeholders

This section addresses AWS Criterion 1.2 "*Understand relevant stakeholders, their water-related challenges, and the site's ability to influence beyond its boundaries."*

Indicators for Criterion 1.2 considered in this section include*:*
"1.2.1: "Stakeholders and their water-related challenges shall be identified. The process used for stakeholder identification shall be identified."
"1.2.2: "Current and potential degree of influence between site and stakeholder shall be identified, within the catchment and considering the site's ultimate water source and ultimate receiving water body for wastewater."

The most relevant stakeholders for water stewardship activities are individuals, groups, and entities that share the same water sources. Many issues are interlinked, such as environmental health, community wellbeing, local economy, and the organization's reputation. This means that stakeholder will not be exclusively water users upstream or downstream from the implementer.

It is valuable to understand the water-related challenges from the stakeholders because it can inform the types of stewardship activities that will be beneficial to the catchment and the local communities. It can also help align the implementer with stakeholders to form partnerships for water stewardship work.

Stakeholder: Any organization, group or individual that has some interest or 'stake' in the implementing organization's activities, and that can affect or be affected by them. The four main categories of stakeholder are: (1) Those who impact on the organization; (2) Those on whom the organization has (or is perceived to have) an impact; (3) Those who have a common interest; (4) Neutral - those with no specific link, but with whom it is relevant to inform. Of most relevance to water stewardship are stakeholders associated with water use and dependency, but engagement should not be limited to these. (Alliance for Water Stewardship, 2019)

The stakeholders were identified in an iterative process of thinking through which organizations are connected to Cavendish in terms of water-related activities, and then which individual for each organization could be contacted. The entity that supplies water, and the entity that processes wastewater for the site were added to the list, any major entity that shares the same source of water was considered in terms of the potential impact from the site, and the organizations that are connected through

management of water that is used by the site were considered. Then organizations were added to the list of stakeholders based on the fact that the overall watershed health and water supply were identified as shared water challenges, and also based on what potential water-related risks and impacts from the site were identified. There were also organizations added to the list of stakeholders simply based on their already being engaged as part of the project Working Group.

8.2 Stakeholder Engagement Tracking

This section addresses AWS Criterion 1.6 "*Understand current and future shared water challenges in the catchment, by linking the water challenges identified by stakeholders with the site's water challenges."*

Indicators for Criterion 1.6 considered in this section include*:*
"1.6.1 - Shared water challenges shall be identified and prioritized from the information gathered." and "1.6.2 - Initiatives to address shared water challenges shall be identified."

As stakeholder engagement is essential for water stewardship and is best done in an iterative process, Cavendish engaged in four different engagement formats with a variety of stakeholder groups. This included Working Group meetings, an in-person focus group, an online discussion via Microsoft Teams, and emailed questions. The objectives of each engagement were to provide understanding for stakeholders to be able to answer questions, understand their perspectives on water-related concerns, and hear suggestions for implementable water stewardship actions that could mitigate those concerns.

Working Group meetings

Four Working Group meetings were held for the Agricultures Water Future project. The meetings included various discussions of the risks, opportunities, actions, and progress around the Cavendish Farms Lethbridge site water stewardship planning. The Working Group meetings were held October 26th 2021, January 20th 2022, April 12th 2022, and October 19 2022.

The Working Group included representatives from the following organizations:

- Cavendish Farms
- St. Mary River Irrigation District
- Nutrien
- Alberta Irrigation Districts Association
- Potato Growers of Alberta
- Agriculture and Agri-Food Canada
- University of Lethbridge
- Lethbridge College
- City of Lethbridge
- Prairies Economic Development Canada
- Alberta Innovates

- Oldman Watershed Council
- Alberta Agriculture and Forestry
- Lethbridge Economic Development
- Ducks Unlimited
- SCS Global Services
- Canola Council of Canada
- Eastern Irrigation District
- Crop Sustainability Working Group
- Ag for Life
- ARECA

Focus Group

A focus group was held in Lethbridge on March 3, 2022, to bring together stakeholders of the Lethbridge Cavendish processing plant. The stakeholders in this session included:

- Cavendish Farms
- SMRID
- Alberta Irrigation Districts Association
- Alberta Agriculture, Forestry and Rural Economic Development
- Alberta Conservation Association
- The Municipal District of Taber
- Potato Growers of Alberta
- City of Lethbridge
- Lethbridge County

This stakeholder group highlighted several key water-related concerns, the first being a reduction in government support and funding to support water quality and monitoring. Government responsibility in water quality monitoring has decreased over the last few years, as they used to take samples and provide administration and analysis. Much of this responsibility now lies within irrigation districts and AIDA, yet the agricultural sector feels that the government must be more involved to secure public confidence in the data. A second key concern is invasive species within upstream reservoirs, as stakeholders indicated that the boat cleaning and mussel program needs to evolve so there are other stakeholders that can be bonified inspectors. Further concerns include impacts of climate change on water availability and water quality impacts of upstream users (i.e., impacts of upstream coal mining).

This focus group then brainstormed and prioritized potential actions to address water stewardship and sustainability. The actions, prioritized from high to low, include:

1. Leveraging government support and funding for water quality and quantity monitoring.

2. Creating and formalizing opportunities for communication regarding water stewardship and water management in agriculture.
3. Communicating, and educating on, farm level best management practices.
4. Working with end users to develop standards and to communicate the credibility of these standards publicly.
5. Companies to develop pages on their websites that specifically address sustainability and stewardship practices.
6. Collaboratively agree on one climate change projection model for planning purposes.
7. Buyers need to implement and support standard methods for purchase.
8. Implementing regional data collection to report on the big picture.
9. Improving inspection program for upstream reservoirs.

Online Meeting

An online meeting was held on March 31 via Microsoft Teams for those who could not make it to the focus group, and it included two stakeholder organizations. Stakeholders identified water related concerns to be enough water supply for all users, especially enough to support fish and other aquatic species in the river. Actions identified to address these concerns included ensuring river instream flow objectives, wetland restoration and conservation, improving water use efficiency, defining sustainability, and encouraging more collaborative discussions regarding the balance of agriculture and environmental protection. A key action to addressing instream needs is improving water use efficiency, which includes irrigation moving towards high- and low-pressure pivots, producers diversifying their crops, and instrumentation that allows producers to understand exactly when to irrigate.

Email Correspondence

Several stakeholder groups were invited over email to provide their perspectives to the same questions of water related concerns and potential mitigation actions. On March 28, 2022, the following groups were contacted:

- Raymond Irrigation District
- Lethbridge North Irrigation District
- Trout Unlimited
- Pulse Growers of Alberta
- Alberta Wheat Commission
- Alberta Sugar Beet Growers
- Government of Alberta (a Fisheries Biologist)
- Town of Taber

Four stakeholder organizations responded to the outreach email, providing their responses to the questions and highlighting their concerns. **[Include a summary of the points from the email responses]**

9. Shared water challenges

This section addresses AWS Criterion 1.6 "*Understand current and future shared water challenges in the catchment, by linking the water challenges identified by stakeholders with the site's water challenges.*"

Indicators for Criterion 1.6 considered in this section include*:*
"1.6.1 - Shared water challenges shall be identified and prioritized from the information gathered," and "1.6.2 - Initiatives to address shared water challenges shall be identified."

As is identified in Appendix A: Watershed Context, the Oldman River Watershed experiences high water demands relative to the annual volume of water naturally available. For years when there is less precipitation than usual and lower natural water supply, there may not be sufficient water for all water users to withdraw their full amount. Water use is managed by the provincial government through a water licencing system that uses priority numbers, the more senior licences have prior right to withdraw their water allocation when there is water scarcity. The relative demand in the Oldman River Watershed is high and the government no longer accepts applications for new surface water licences. The most commonly discussed shared water challenge is water scarcity or drought.

Much of the geographic region of the Oldman River Watershed is arid and experiences hot, dry summers (see Appendix A: Watershed Context). Most of the agricultural water users in the region are experienced in managing limited water availability and changing their operations in drier years, however economic impact is still felt and there is still significant concern about extreme events and multi-year droughts as these have very significant negative impacts.

The stakeholder engagement process identified a variety of shared water challenges. The following are the primary shared water challenges:

Impact of climate change on water availability. Changing timing and volume of water available due to changes in natural precipitation (snow and rain).

Impact of climate change and the high water demands compounding stress on the ecosystems. There are concerns that climate change may create additional challenges for meeting instream flow and water quality needs for southern Alberta rivers, and therefore the health of river ecosystems (and connected ecosystems) will be negatively impacted.

Reduced government support for water quality monitoring. Lack of government support for streamflow monitoring stations and water quality monitoring programs results in very limited data for all forms of planning and water management.

Oldman watershed closed to new licences. The fact that the basin is overallocated and there

are no more surface water licences being issued is a shared water challenge.

Threat of invasive species. Invasive species can cause significant damage to ecosystems, native species populations, irrigation infrastructure, water treatment infrastructure, recreation, etc.

Water quality impacts of upstream users. Increasing sedimentation, contaminants, or factors that increase water temperature upstream negatively impact downstream uses.

Wetland restoration and conservation. Wetlands are considered valuable natural areas providing many services and loss of these areas is an ongoing challenge in the watershed.

Meeting instream objectives in the river and ensuring water in the river for ecosystem needs. There are minimum flow objectives for the Oldman River and its tributaries that are not always met, which is a challenge for aquatic and riparian ecosystems and species.

Increase of organics in water, and algae blooms. Increasing nutrients and organics in the water bodies leads to water quality problems, including algae blooms, which are difficult to manage.

9.1 Opportunities and actions

The stakeholder engagement focus group (March 3rd) discussed shared water challenges, then they identified the opportunities and actions to respond to those challenges, and then voted on the ideas list to prioritize them. The focus group brainstormed and prioritized actions to address water stewardship and sustainability. Table 7 below captures the results of that exercise.

Table 7. Stakeholder focus group prioritized actions to address water stewardship and sustainability.

Priority items	Government and Municipal	Industry Associations	Conservation Groups	Implementers
Leveraging government support and funding for water quality and quantity monitoring	**2 votes**	**2 votes**	**1 vote**	**1 vote**
Creating and formalizing opportunities for communication regarding water stewardship and water management in agriculture	**3 votes**		**1 vote**	**1 vote**
Communicating, and educating on, farm level best management practices		**2 votes**		**2 votes**
Working with end users to develop standards and to communicate the credibility of these standards publicly	**2 votes**	**1 vote**		
Companies to develop pages on their websites that specifically address sustainability and stewardship practices (e.g., "Sustainability FAQ")	**1 vote**		**1 vote**	
Collaboratively agree on one climate change projection model for planning purposes	**1 vote**			**1 vote**
Buyers need to implement and support standards methods for purchase		**1 vote**		**1 vote**
Implementing regional data collection to report on the big picture		**2 votes**		
Improving inspection program for upstream reservoirs (i.e., modernise inspection program)		**1 vote**		

10. Important Water-Related Areas

This section addresses AWS Criterion 1.3 "*Gather water-related data for the site, including: water balance; water quality, Important Water-Related Areas, water governance, WASH; water-related costs, revenues, and shared value creation.*"

Indicators for Criterion 1.3 considered in this section include:
"1.3.6: On-site Important Water-Related Areas shall be identified and mapped, including a description of their status including Indigenous cultural values."

Please see Appendix A: Watershed Context (page 15) for an introduction to Important Water-Related Areas (IWRAs), and the definition according to AWS.

Site:

The Cavendish Farms Lethbridge Site does not have any natural water bodies on the site itself. The description of Important Water-Related Areas in the Alliance for Water Stewardship Standard was used to determine if the nearby and onsite water bodies qualify as Important Water-Related Areas. It was determined that the pipeline carrying the SMRID lateral canal underground beneath the Cavendish Farms Site (Figure 7) is of economic importance and is linked to many other water users, therefore it is an Important Water-Related Area. The other water features on site are drainage ditches and a stormwater pond which are not considered of significant environmental, cultural, economic or community value and are therefore not Important Water-Related Areas.

Figure 7 Map showing approximate location of underground SMRID water pipeline.

Project Geographic Area:

The IWRAs in the Project Geographic Area were identified through research and stakeholder engagement. Research into ecologically important areas in the Oldman River watershed was done by examining the state of the Watershed Report, provincial government maps of ecologically sensitive areas, and the maps of parks and conservations areas. A published study specifically on Indigenous history and values and the Traditional Knowledge and uses for areas in the City of Lethbridge was reviewed (The Blackfoot Confederacy of Alberta in association with Arrow Archaeology Ltd., 2017). See Appendix A: Watershed Context for more details on the research results.

The Working Group members were asked to identify IWRAs that they were aware of on the site, in the bigger Project Geographic Area, as well as the Oldman Watershed as a whole. The Working Group identified the following list of IWRAs (note some of these are duplications or overlap due to the way responses were submitted):

- Castle Provincial Park
- Cottonwood forests
- Chin Reservoir
- All AEP reservoirs
- All Irrigation District reservoirs
- Eight Mile lake
- Oldman River
- Saint Mary River
- Saint Mary reservoir
- Hellen Schuler Nature Reserve
- Henderson Lake
- City of Lethbridge water treatment facilities
- Lethbridge Coulee
- Park Lake
- Raymond Reservoir
- Northeast reservoir

The report “Traditional Knowledge and Use Assessment, City of Lethbridge” included the following maps identifying historical site locations and select plant locations identified in the assessment (The Blackfoot Confederacy of Alberta in association with Arrow Archaeology Ltd., 2017). These maps clearly show that the river valley and coulees of the Oldman River as it goes through Lethbridge are important for local Indigenous Peoples. The majority (but not all) of the historical sites are in the river valley, and the important plants that are specified in the map are primarily located along the river or in the coulees.

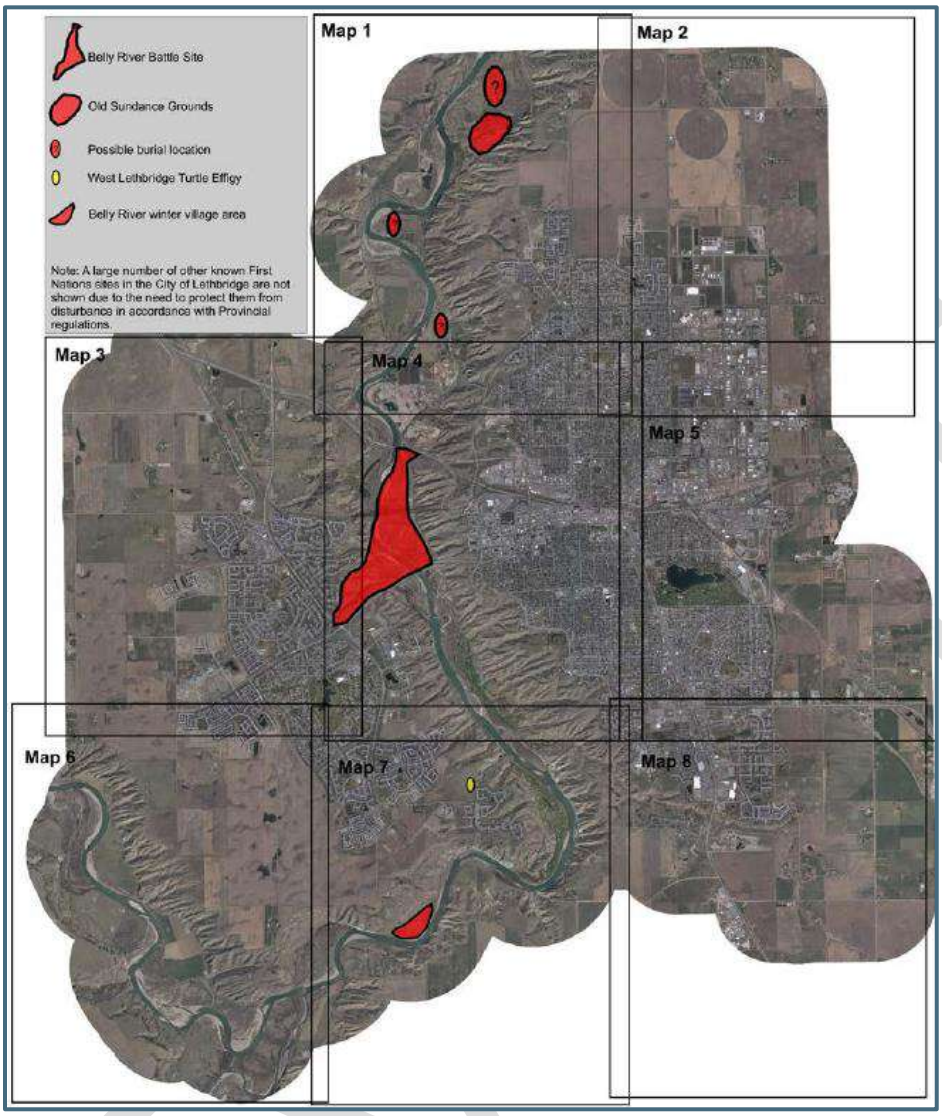

Figure 8 Historical site locations from the Traditional Knowledge and Use Assessment, City of Lethbridge (The Blackfoot Confederacy of Alberta in association with Arrow Archaeology Ltd., 2017).

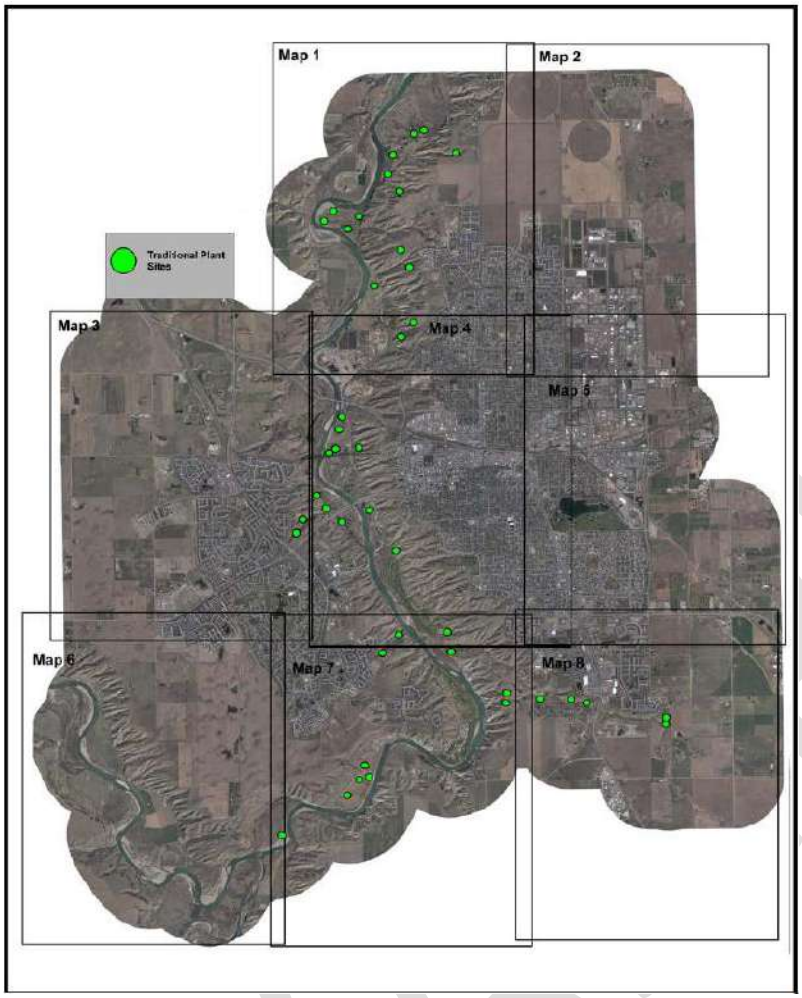

Figure 9 Select plant locations from the Traditional Knowledge and Use Assessment, City of Lethbridge (The Blackfoot Confederacy of Alberta in association with Arrow Archaeology Ltd., 2017).

A GIS map of the local parks was acquired an overlaid on the Project Geographic Area map () to highlight where there are IWRAs within the boundary of the Project Geographic are, and how close they are to the Implementers sites.

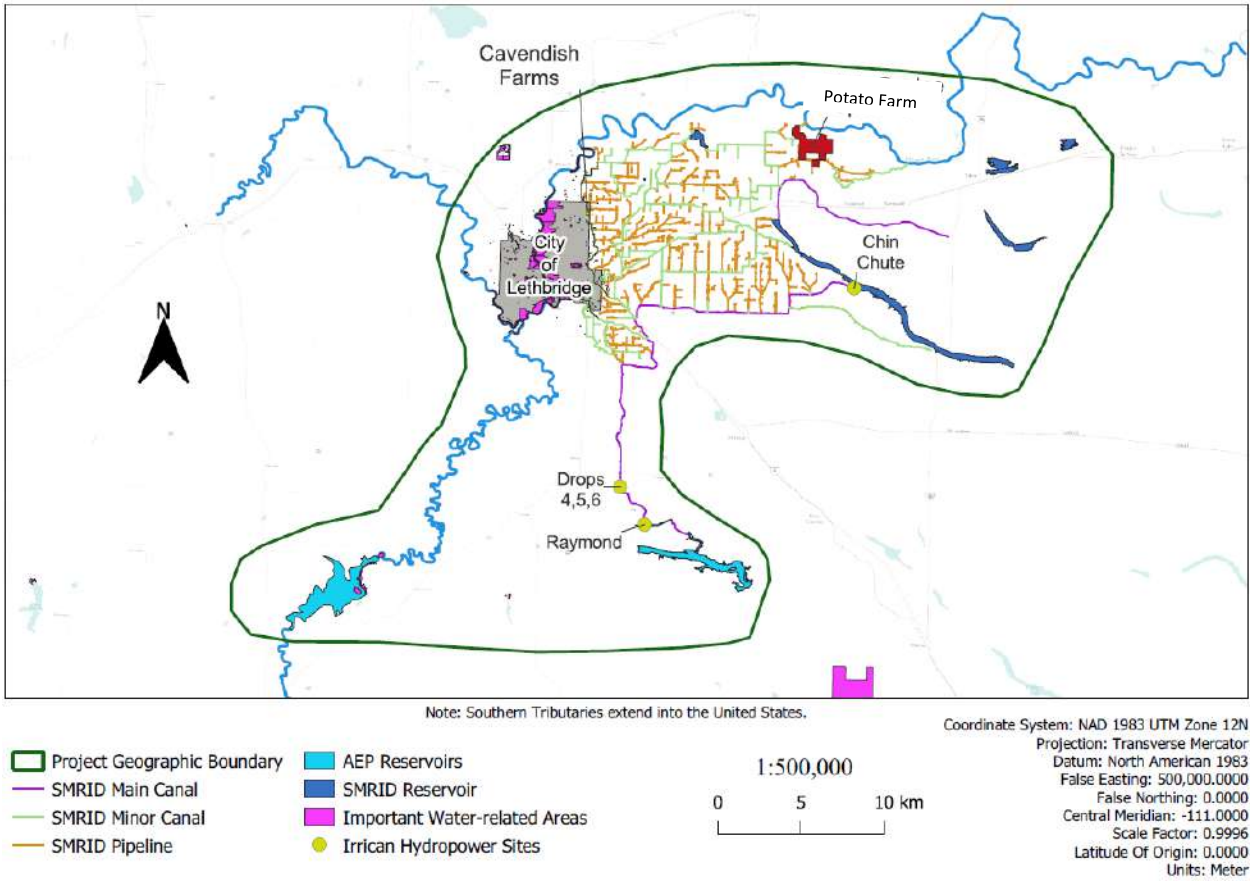

Figure 10 Map displaying the defined Project Geographic area and the Important Water-related Areas in pink colour.

The following is the list of IWRAs within the Project Geographic Area:

Name of IWRA and description	Location	Value or factors of importance	Status	Any water-related risks
Oldman River		Community, economic, environmental	Fair[1]	
St. Mary River		Community, economic, environmental	Fair[1]	

[1] From the Oldman River State of the Watershed Report (Oldman Watershed Council, 2010)

St. Mary Reservoir	Upstream water source for SMRID	Community, economic, environmental	Good	
City of Lethbridge water treatment and wastewater treatment facilities	Lethbridge	Community, economic, environmental	Good working order	
Lethbridge Coulee	Lethbridge	Community, economic, environmental	Fair	
Hellen Schuler Nature Reserve	Lethbridge	Community, economic, environmental	Good	
Henderson Lake	Lethbridge	Community, economic	Good	
Park Lake	North-west of Lethbridge	Community, economic, environmental	Good	
Cross Coulee Reservoir	Irrigation reservoir	Economic value	Good working condition	Invasive species, riparian damage and sedimentation
Raymond Reservoir	Irrigation reservoir	Economic value	Good working condition	Invasive species, riparian damage and sedimentation
North-East Reservoir	Irrigation reservoir	Economic value	Good working condition	Invasive species, riparian damage and sedimentation
Chin Reservoir	Irrigation reservoir	Economic value	Good working condition	Invasive species, riparian

				damage and sedimentation
Stafford Reservoir	Irrigation reservoir	Economic value	Good working condition	Invasive species, riparian damage and sedimentation

11. Indirect Water Use by site

This section addresses AWS Criterion 1.4 "*Gather data on the site's indirect water use, including: its primary inputs; the water use embedded in the production of those primary inputs the status of the waters at the origin of the inputs (where they can be identified); and water used in out-sourced water-related services.*"

Indicators for Criterion 1.4 considered in this section include:
"1.4.1 - The embedded water use of primary inputs, including quantity, quality and level of water risk within the site's catchment, shall be identified."
"1.4.2 - The embedded water use of outsourced services shall be identified, and where those services originate within the site's catchment, quantified."

The AWS Standard directs water stewards to think through and begin to understand the reliance on water quality and quantity that arises in their suppliers and key input products. The indirect water use is referring to water used in the creation, processing and transportation of goods and services supplied to the site. It is increasingly recognized as good practice for an operation to understand their indirect water use to some extent, and the importance of water through the agriculture supply chain is a central principal for the AWF project overall. Involving multiple, connected supply chain members as implementers in water stewardship within the project inherently incorporates indirect water use.

Indirect Water Use: Water used in a site's supply chain representing that used in the manufacturing and provision of all products and services, excluding water used on site. In effect, it is the sum of 'embedded water' of all products and services (Alliance for Water Stewardship, 2020).

Primary Input: The materially important products or services that a site consumes to generate the products or services it provides as its primary function (Alliance for Water Stewardship, 2019). A larger component of materials, ingredients or services used at the site to produce its principal outputs (products or services). It does not include supplies for 'one-off' constructions or services such as for infrastructure or buildings (Alliance for Water Stewardship, 2020).

AWS guidance suggests that primary inputs should include any externally procured goods or services that account for over 5 per cent of the total weight of the goods generated, or 5 per cent of the costs of a site (Alliance for Water Stewardship, 2020).

The list of primary inputs to the Cavendish Farms Lethbridge site is below:

- **[list of primary inputs and relevant details]**

12. Implementation Plan

Cavendish Farms Lethbridge site is committed to responsible water use, has already taken into consideration water use efficiency on the site and has engaged in some water stewardship activities as a company. The site uses water management systems, including for efficient water reuse, which are at the forefront of the potato processing industry. Additionally, the operations management personnel have particular awareness of, and focus on, improvement in water use efficiency and conserving water in the processing line. Specific actions that have been done to date or are ongoing are listed in Table 8.

Many diverse water stewardship actions were identified through the AWF project work, see section 12.1 for a description of how they were identified. The water stewardship actions have been sorted into those that are already ongoing as part of SMRID operation (Table 8), and the short-term and long-term actions for the future (Table 9 and Table 10).

Throughout this section the water stewardship actions are categorized in alignment with the four water stewardship objectives The summary table below (Table 1) captures the commitment, objectives, and intended outcomes for water stewardship.

Table 1 Water stewardship summary of commitment statement, objectives and outcomes. As well, each action has one or more potential metrics identified. These metrics have been developed from a preliminary brainstorming process only. If Cavendish chooses to conduct monitoring and reporting on their water stewardship actions, internally or externally, they will likely determine the exact metrics to be used through an internal, strategy-based decision-making process.

The last column in each of Table 8, Table 9, and Table 10 links to Section 7: Site water risks and opportunities of this document. The process of identifying and ranking the water-related risks and opportunities for Cavendish Farms Lethbridge site enables the implementation actions to be chosen based on their ability to mitigate risks or leverage opportunities. The 'Risks and Opportunities' column in the tables supports that consideration.

Table 8 Water stewardship to date and ongoing activities

Identifier	Action	Status	Water Stewardship Objectives	Metrics and target	Costs	Benefits	Risks and Opportunities
Current Action 1	Cavendish is an active member in the Potato Sustainability Alliance (PSA). The PSA hears from potato-growers about on-farm practices, encouraging on-farm improvements, and defining metrics that demonstrate sustainability for potatoes. Some farm level Best Management Practices related to water stewardship have been identified by the PSA, including having a whole farm soil and water management	Ongoing	Watershed Context and External Engagement	Metrics: - PSA meetings attended each year, **[insert target]**. - Number of producers Cavendish spoke with regarding BMPs related to water, **[insert target]**.	Membership fee, time required for participation.	Members of the PSA are committed to advancing a common vision of potato sustainability and delivering economic, environmental, and social outcomes at scale. Farm level BMPs and water stewardship activities are observed	Risk 2 Table 5 and Opp B Table 6

Identifier	Action	Status	Water Stewardship Objectives	Metrics and target	Costs	Benefits	Risks and Opportunities
	plan and minimizing nutrient and pesticide runoff through timing and location of application.					throughout the supply chain, which can be demonstrated in marketing activities.	
Current Action 2	The Lethbridge site uses water management systems in its operation, including water reuse, to improve water use efficiency. A significant amount of water is reused daily, resulting in measurable cost savings.	Ongoing	Operational Resilience Internal Collaboration	Metrics: - Average volume of water reused each day **[insert target]**.	Minimal costs as this is based on the facility design.	Cost savings related to water reuse efficiency.	Risk 9 and 7, Table 5
Current Action 3	Key operations personnel at the Lethbridge site have taken initiative regarding improvements in water use efficiency and water conservation in the process line. For example, by turning off specific water sprayers and turning down the rate of water at points in the process line where less water performs the same function.	Ongoing	Operational Resilience Internal Collaboration	Metrics: - Water use per unit product produced, **[insert target]**. - Volume of water saved each day based on small processing line efficiencies, **[insert target]**.	Minimal costs.	Cost savings related to water use efficiency and water conservation.	Risk 9, Table 5
Current Action 4	As a member of the PSA, Cavendish Farms actively supports extensive research and development work into varieties of potatoes that are optimally water efficient.	Ongoing	Watershed Context and External Engagement Operational Resilience	Metrics: - Dollars spent annually on this type of R&D, **[insert target]**.	Time and costs associated with research and development support.	Water conservation throughout the supply chain, which can be demonstrated in marketing activities.	Risk 1, Table 5
Current	Cavendish Farms have established the use of key performance indicators (KPIs) on	Ongoing	Internal Collaboration	Metrics: - Water use per	Minimal cost.	Provides data and information regarding	Risk 9, Table 5

Identifier	Action	Status	Water Stewardship Objectives	Metrics and target	Costs	Benefits	Risks and Opportunities
Action 5	water use. Water use per unit of finished product is reported internally by each facility, on a monthly basis.			unit product produced, **[insert target]**.		water use, which can be used as a basis for water efficiency.	
Current Action 6	Cavendish Farms maintains ongoing relationships with various levels of governments (local, domestic and foreign), promoting the ability of irrigation and agriculture to improve the provincial and national GDP of Canada.	Ongoing	Watershed Context and External Engagement Impact Mitigation	Metrics: - Number of email/phone or meetings with government representatives in a year **[insert target]**.	Time associated with building relationships.	Improving economic opportunities for ag and agri-food sector in Alberta.	Opp 16, Table 6
Current Action 7	Have the water quality of municipal water entering the plant tested and reported annually in compliance with the food safety program.	Ongoing	Impact Mitigation	Metrics: - Annual water quality reports produced, **[insert target]**.	The cost of testing and analysis.	Better understand water quality in the facility.	Risk 10, Table 5

12.1 Process of identifying implementation actions

Cavendish Farms identified water-related risks to their operation through a brainstorming process with the support of stakeholders and other experts through a Working Group session. This process took into consideration the watershed context and potential direct and indirect impacts to Cavendish's water supply, and the impacts the Cavendish Farms site could have on other users. With this same group of people, Cavendish brainstormed opportunities for improvements and partnerships related to water. The identified risks and opportunities were combined and listed in Table 5 Risks identified for Cavendish, with priority score and ranking. Table 5 and Table 6 (see section 7, Site water risks and opportunities), because in many instances an identified risk had a corresponding opportunity already articulated. The list of risks and opportunities was reviewed, refined and streamlined to ensure that the way each was articulated was clear and relevant to Cavendish operations.

The list of risk and opportunities was used to identify actions, which would be the basis for this implementation plan. One, or a series of, action(s) was identified for each risk and opportunity, which formed a large list of potential actions that address water stewardship and sustainability. For each potential water stewardship action, a high-level assessment of costs and benefit was completed. The cost and benefits were added to the list of actions, to enable some comparison between the actions. The actions list was sorted by the timeline of feasible implementation. The immediate and short term actions are listed in Table 9 below, and long-term actions are in section 12.3, Roadmap for future water stewardship actions.

12.2 Implementation actions

The list of actions in Table 9 will be implemented by Cavendish as part of this water stewardship initiative.

Table 9. Short term implementation actions

Identifier	Action	Status	Water Stewardship Objectives	Metrics and target	Costs	Benefits	Start and End Date	Risks and Opportunities
Short Term 1	Build a relationship between Cavendish and the City of Lethbridge around water stewardship interest and collaboration.	Cavendish and the City had an initial meeting. Need to continue discussions.	Watershed Context and External Engagement	Metrics: - Emails and phone calls exchanged by the right people in both organizations, **[insert target]**. - Number of meetings held, target **[insert target]**.	The costs will depend on what types of collaboration and opportunities are identified. (e.g. collaboration on a public campaign will take staff time and advertising money).	A stronger relationship with City of Lethbridge (benefits in opportunities). Positive image amount the public of Lethbridge, recognition as a responsible and good corporate citizen. Reduced cost of water.	**[insert start and end date]**	Risk 6, Table 5
Short Term 2	Cavendish receives a proposal and supports a local watershed non-profit group to do an upstream watershed stewardship project such as riparian restoration.	Not started	Watershed Context and External Engagement	Metrics: - number of riparian areas restored, **[insert target]**. - number of non-profit partners, **[insert target]**.	The funding amount provided based on the proposal received. Potentially time associated with being involved.	Demonstrate a commitment to the aquatic ecosystem and water stewardship overall. Improve water quality in the watershed. Build relationships within the watershed.	**[insert start and end date]**	Risk 5, Table 5
Short Term 3	Designate a staff position at Cavendish Farms Lethbridge that has ownership over actively improving water use efficiency and promote successes.	Planned for his year – The Billion Litre Project will be moving forward with this designated staff position	Operational Resilience	Metrics: - number of staff positions designated, **[insert target]**.	The cost of staff time/position focused on water use efficiency and promotion activities.	Having one individual dedicated to water use efficiency would ensure targets are met and momentum is maintained to drive the associated actions forward.	**[insert start and end date]**	Risk 9, Table 5
Short	Switch from municipal	Initiated, in	Operational	Metrics:	Possible cost for	Switch to using SMRID	**[insert start**	Risk 3,

Identifier	Action	Status	Water Stewardship Objectives	Metrics and target	Costs	Benefits	Start and End Date	Risks and Opportunities
Term 4	water supply to SMRID water to irrigate the Cavendish Farms Lethbridge facility lawn. Reduce the overall cost of water use on site.	the preliminary design and pricing stage within Cavendish	Resilience	- percent of water for irrigating the lawn supplied by SMRID, **[insert target]**.	minimal diversion infrastructure/pump, contracting time for the agreement between parties	water saves costs because the water per unit volume is cheaper (this would be direct dollar cost saving).	**and end date]**	Table 5
Short Term 5	Engage in and support discussions regarding watershed stewardship and planning.	Planned for this year – Engage in an annual stakeholder meeting and the SSROM project.	Watershed Context and External Engagement	Metrics: - number of watershed engagement meetings attended each year, **[insert target]**.	The time associated with engaging in water management discussions. The financial cost will depend on what form of engagement is determined to be valuable.	Demonstration of commitment to the community. Improve water security.	**[insert start and end date]**	Risks 11 and 1, Table 5

12.3 Roadmap for future water stewardship actions

The list of actions in Table 10 are the water stewardship actions that will not be completed within the short-term, but are being considered in multi-year planning and budgeting process.

Table 10 Long-term implementation actions.

Identifier	Action	Status	Water Stewardship Objectives	Metrics and target	Costs	Benefits	Risks and Opportunities
Long Term 1	Offer support (e.g., financial, training, etc.) to producers for specific BMPs related to water stewardship.	Not started	Watershed Context and External Engagement	Metrics: - Average water use and nutrients applied per unit of potatoes received, **[insert target]**.	This will depend on what types of financial support or training would be offered. The cost and time associated with developing one or more training programs, promoting and offering it on an ongoing basis. The cost of offering financial support would include the money itself as well as the administration of applications and dispersing funds, and any promotion	This is one of the most likely actions to achieves bottom-up sustainability from the producer level. Cavendish is more likely to be able to advertise their product ethical sourcing if they support their producers.	Opp 13, Table 6
Long Term 2	Participate in a public education campaign telling the Southern Alberta agriculture story, partner with other organizations to extend the reach of the campaign. Specifically communicating what is already being done, responsible water use and water stewardship	Not started	Watershed Context and External Engagement	Metrics: - number of public engaged (web view etc.), target **[insert target]**. - number of organization partners, **[insert target]**.	Time associated with participating in a public education campaign.	Improving public trust in agriculture. Improving relationships with other organizations. More public recognition of Cavendish as a responsible and good corporate citizen.	Opp 15, Table 6

Identifier	Action	Status	Water Stewardship Objectives	Metrics and target	Costs	Benefits	Risks and Opportunities
	throughout the supply chain, and collaborative planning for water scarcity.						
Long Term 3	Set up a water quality monitoring system or process at the Cavendish facility. Water quality of municipal water entering the plant, and wastewater quality leaving the plant.	Not started	Impact Mitigation	Metrics: - frequency of water monitoring, **[insert target]**. - amount of TSS in wastewater, **[insert target]**.	The cost of setting up the equipment and resources required to monitor water quality. If the equipment is all in place already, then the only cost is staff time to develop the process and monitor/data management regularly.	Better understand water quality changes in the facility. Able to report on water quality for water stewardship initiatives.	Risk 10, Table 5
Long Term 4	Create a wastewater treatment process on site for water being sent to City of Lethbridge.	Not started	Impact Mitigation	Metrics: - percent of wastewater treated, **[insert target]**. – amount of TSS in wastewater, **[insert target]**.	Cost of investing in water treatment process and operation.	$ savings for the wastewater treatment (costs paid to City of Lethbridge). Improve the water quality that is being sent to the City of Lethbridge. Improve relationship with City of Lethbridge.	Risk 7, Table 5
Long Term 5	Look at and continue assessment of alternate approaches to use the lawn space which demonstrate water conservation.	Not started	Operational Resilience	Metric: - Cubic meters of water conserved, target **[insert target]**.	Costs dependent on the form this action takes, could be only the capital cost of replacing the lawn with preferred.	Not watering the lawn saves costs ($ for 34,500m3 water), eliminates cost of paying person to mow the lawn, reduces water use (being water	Risk 3, Table 5

Identifier	Action	Status	Water Stewardship Objectives	Metrics and target	Costs	Benefits	Risks and Opportunities
						conscious), and improves public image of not wasting water. Convert lawn area to natural wastewater treatment saves costs of water and also wastewater ($ paid to Lethbridge), and improves public image of not wasting water (if public communication makes it clear).	
Long Term 6	Evaluate the stormwater impacts of the Cavendish Farms Lethbridge site. Based on the evaluation results, identify and implement beneficial stormwater management actions. This may link with another action.	Not started	Impact Mitigation Operational Resilience	Metrics: - Change in water quality parameter of interest over time due to change in practice , **[insert target]**.	The cost and time associated with developing a stormwater management plan. The potential capital costs of stormwater infrastructure if identified in the plan.	Better management of stormwater quantity and quality concerns. Benefits will be observed by Cavendish and also downstream water users that collet stormwater (e.g. SMRID)	Risk 5, Table 5
Long Term 7	Evaluate what water-related incident response plans do not yet exist for the Cavendish Farms Lethbridge site and	Not started	Impact Mitigation Operational Resilience	Metrics: - number of incident risk scores reduced through planning, **[insert target]**.	Minimal cost.	Meet the AWS criteria, and know which incident response plans are not on hand.	Risk 5, Table 5

Identifier	Action	Status	Water Stewardship Objectives	Metrics and target	Costs	Benefits	Risks and Opportunities
	develop them.						
Long Term 8	Achieve AWS certification as a means of demonstrating to buyers that good stewardship is being done	Application not yet submitted, but review of water stewardship is started through this project/report.	Internal Collaboration	Metric: - AWS Standard certification achieved, **[insert target]**.	The cost of one or more staff responsible for documentation of meeting the criteria of the AWS standard. This would likely be a permanent position because maintaining AWS certification requires annual monitoring and reporting.	Benefits associated with water stewardship should be naturally observed. Certification by an internationally recognized standard can be used in marketing activities to demonstrate commitment to sustainability.	Risk 2, Table 5
Long Term 9	Document and share best practices of water use efficiency, wastewater treatment, and water reuse across all Cavendish facilities	Connected to the Billion Litre Project.	Internal Collaboration	Metric: - Percent of Cavendish site locations engaged and receiving BMP documents, **[insert target]**.	Very low cost, it just takes the time for staff to prepare the document and send it and then for the rest of staff to read it or have a 'lunch and learn' or something.	Benefit is that water management best practices (e.g. water savings) enjoyed at Lethbridge facility can translate to savings for other facilities	Risk 8 and 9, Table 5

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14. Appendix A: Watershed Context

waterSMART
Water Management Solutions

Agriculture's Water Future

Appendix A: Watershed Context
Appendix to the Water Stewardship Plan

Submitted by:
WaterSMART Solutions Ltd.

Appended on:
February 15 2023

Contents

Document purpose

This document supports a pilot study of implementing water stewardship across an agri-food supply chain. It is the third phase of work for the Agriculture's Water Future project, which is referred to as the AWF project throughout this document.

Setting the watershed context is the beginning of the Agriculture's Water Future (AWF) process. This step involves developing and documenting the characteristics of the watershed where the implementer operates, including water availability, water quality, water source reliability, local stakeholders, current water management, stewardship and governance. This requires research and compiling data and information about the area where the implementer's site is located. The watershed context fits closely with the information gathered about the implementer's site and operations. Together this information is the basis for planning and implementing water stewardship. Further details on the background of the Agriculture's Water Future project can be found in the AWF Phase II report: *A business case blueprint and framework for providing value to the agri-food supply chain through water stewardship* (WaterSMART Solutions Ltd. 2019).

The watershed context is intended to be a tool for creating the water stewardship plans. It provides the information necessary to understand the current state of the watershed (e.g., hydrological, social and economic aspects related to water and the sector of interest), and how a site (e.g., farm, processing facility) interacts with the watershed.

Understanding and documenting the watershed context aligns with the first steps for the with Alliance for Water Stewardship (AWS) Standard (Alliance for Water Stewardship 2019). The information that meets specific criteria for the AWS standard are identified through this document in the blue pop-out boxes.

Geographic context

This section addresses **a portion of** AWS Criterion 1.1 "*Gather information to define the site's physical scope for water stewardship".*

Indicators for Criterion 1.1 include:
"1.1.4: The catchment(s) that the site affect(s) and upon which it is reliant."

A key component to the AWS Standard is defining the physical scope of the site where water stewardship is being implemented. The AWS Standard is a site-based certification system, and the 'site' is defined as the physical area that is owned or directly managed by the implementing organization, and where they carry out their principal activities (Alliance for Water Stewardship 2019). The 'site' can be considered the area within the fence line. Water stewardship requires understanding impacts and planning stewardship actions that extend beyond the fence line. Implementers identify the physical scope for their water stewardship as the site itself and the land and water areas around the site that are impacted by, or have

an impact on, the site. The physical scope is defined by each entity implementing the AWS Standard and is dependent on many factors including the local geography, the size of the site, the wastewater produced on the site, and the source of water used by the site.

The AWF project involves two implementers: the St. Mary River Irrigation District (SMRID) and Cavendish Farms (Lethbridge Site) and one producer advisor. Each implementer has their site and defined physical scope. See Figure 2 for a map of the sites and Figure 3 for a map of the physical scope for the implementers. The implementers are part of the same agri-food supply chain and are located in the same watershed, reliant on essentially the same source water. Therefore, the geography of focus for the AWF project is the area that captures all three implementers. This will be referred to as the project geographic area. Figure 4 shows the defined project geographic area. The definition of project geographic area has been adapted from the definition of *Physical Scope* from the Alliance for Water Stewardship Standard version 2.0, as seen below:

> **Project geographic area**: The land area relevant to the supply chain's water stewardship actions and engagement. It should incorporate all or part of the relevant catchment(s) but may extend to relevant political or administrative boundaries. It is typically centered on the supply chain, but may include separate areas where the origin of water supply is more distant. (Alliance for Water Stewardship 2019)

The project geographic area that is the focus for the AWF project is located within the Oldman River watershed (also referenced as the catchment or the basin). This section of the report will introduce the larger scale context, and then go into detail on the project geographic area.

The Oldman River is a sub-basin of the South Saskatchewan River Basin (SSRB), which eventually flows into Hudson Bay. The implementers participating in the AWF project all source their water from the Oldman River watershed. The Oldman River watershed is predominantly in Alberta, but a small portion originates in Northern Montana, flowing north into Alberta. The area of the watershed within Alberta is approximately 23,000 km^2 (Oldman Watershed Council 2010). Figure 1 (below) is a map of the Oldman River watershed, detailing the major sub-basins of the Oldman watershed.

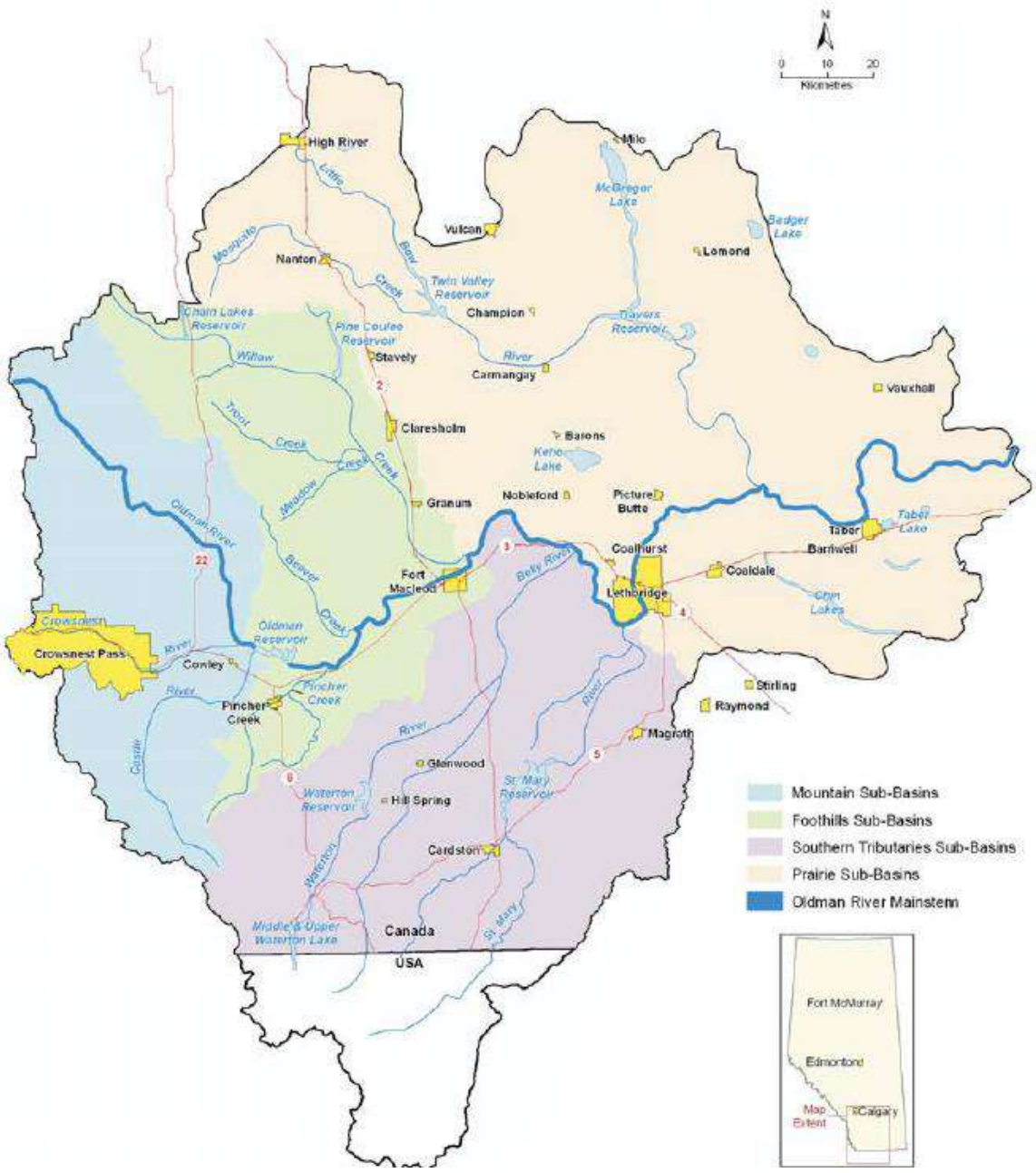

Figure 1: Map of the Oldman River watershed (Oldman Watershed Council 2010)

About 90% of the streamflow in the South Saskatchewan River Basin (SSRB), including the Oldman River watershed, is generated from snow and glacier melt in the Rocky Mountains (WaterSMART Solutions Ltd. 2019).The majority of the Oldman River watershed receives little precipitation throughout the year, and therefore downstream portions of the basin are heavily reliant on precipitation and snowmelt from the Rocky Mountain headwaters for streamflow. A system of major reservoirs and diversions regulates river flows and diverts water to areas of high demand.

The project geographic area of three AWF project implementers is located in the downstream portion of the Oldman River watershed. Figure 2 below shows the locations of the implementers' sites (SMRID and

Cavendish Farms Lethbridge Site), as well as the producer advisor's operation. All are within the Oldman River watershed, which is outlined in black. The SMRID is spread over a large geographic area, and extends beyond the Oldman River watershed into additional areas of the greater SSRB. The original source point of water for all areas of the SMRID is the same upstream reservoir within the Oldman River Watershed.

The map in Figure 2Figure 1 also divides the Oldman River watershed into level 8 scale basins, as defined by the Hydrological Unit Code (HUC). The HUC 8 watershed boundaries are in dark blue.

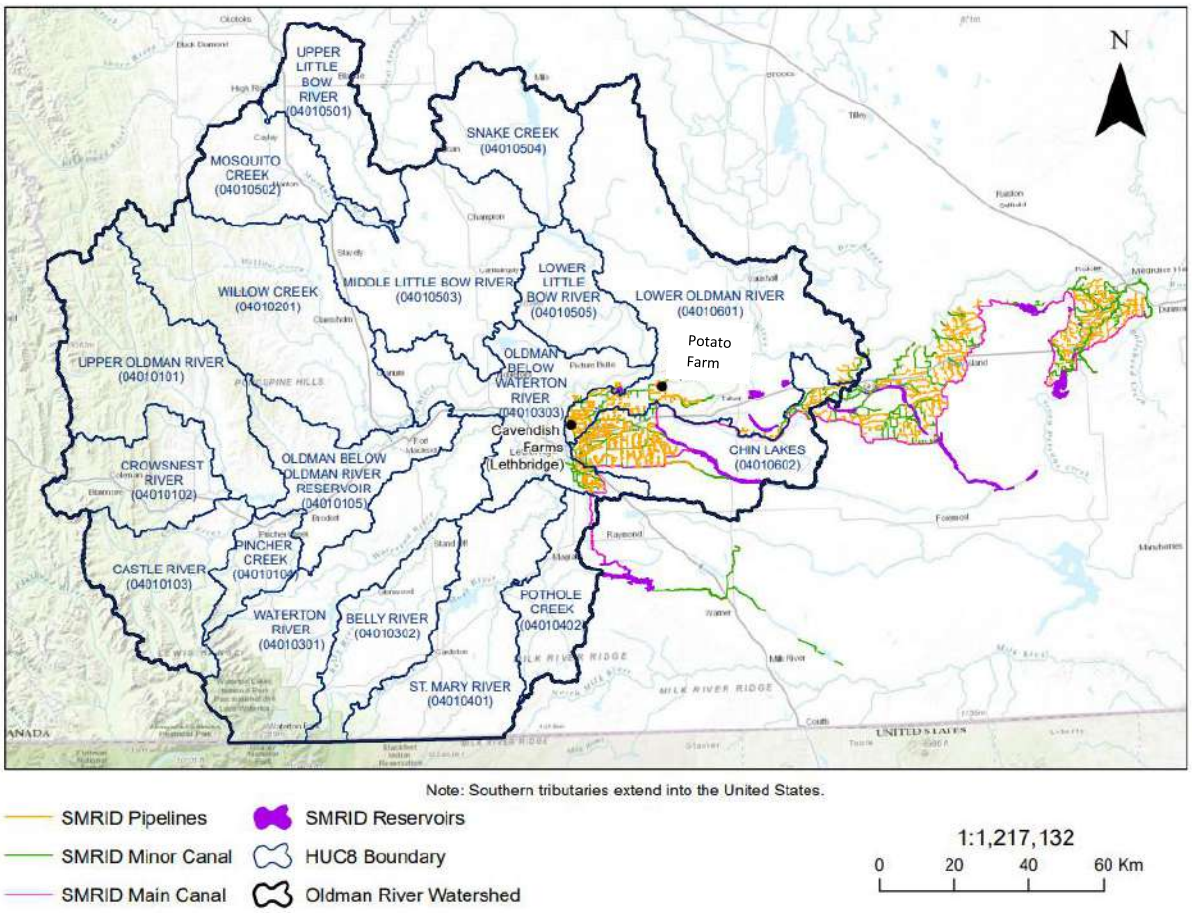

Figure 2: Map showing the locations of the implementers: the SMRID and Cavendish Farms, and the producer advisor's operation.

The physical scope (area beyond the fence line) of each of the AWF project Implementers and producer advisor are shown in Figure 3. The physical scope of each is shaded in a different colour; the SMRID in blue, Cavendish Farms Lethbridge Site in purple, and the potato farm in green. The physical scope of each extends over multiple HUC 8 scale watersheds.

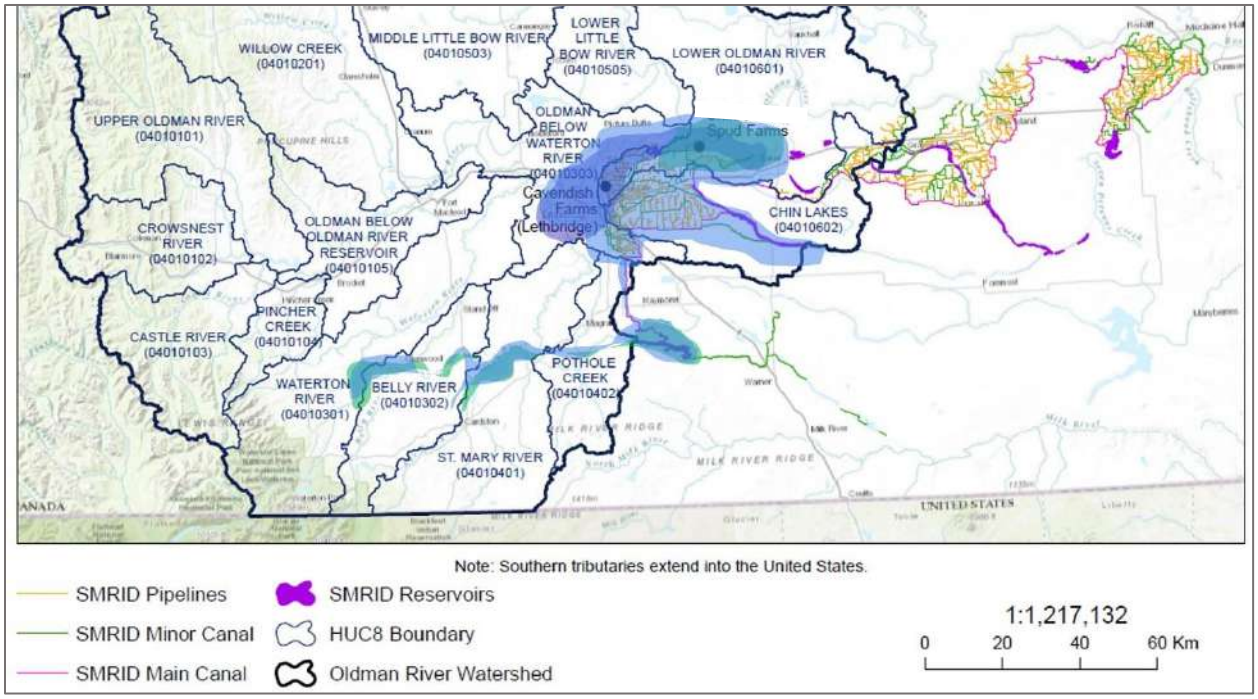

Figure 3: The physical scopes of the two Implementers and the producer advisor are overlaid to show the areas of overlap.

The project geographic area is the focus for watershed stewardship by all three AWF project implementers. The project geographic area is shown in Figure 4.

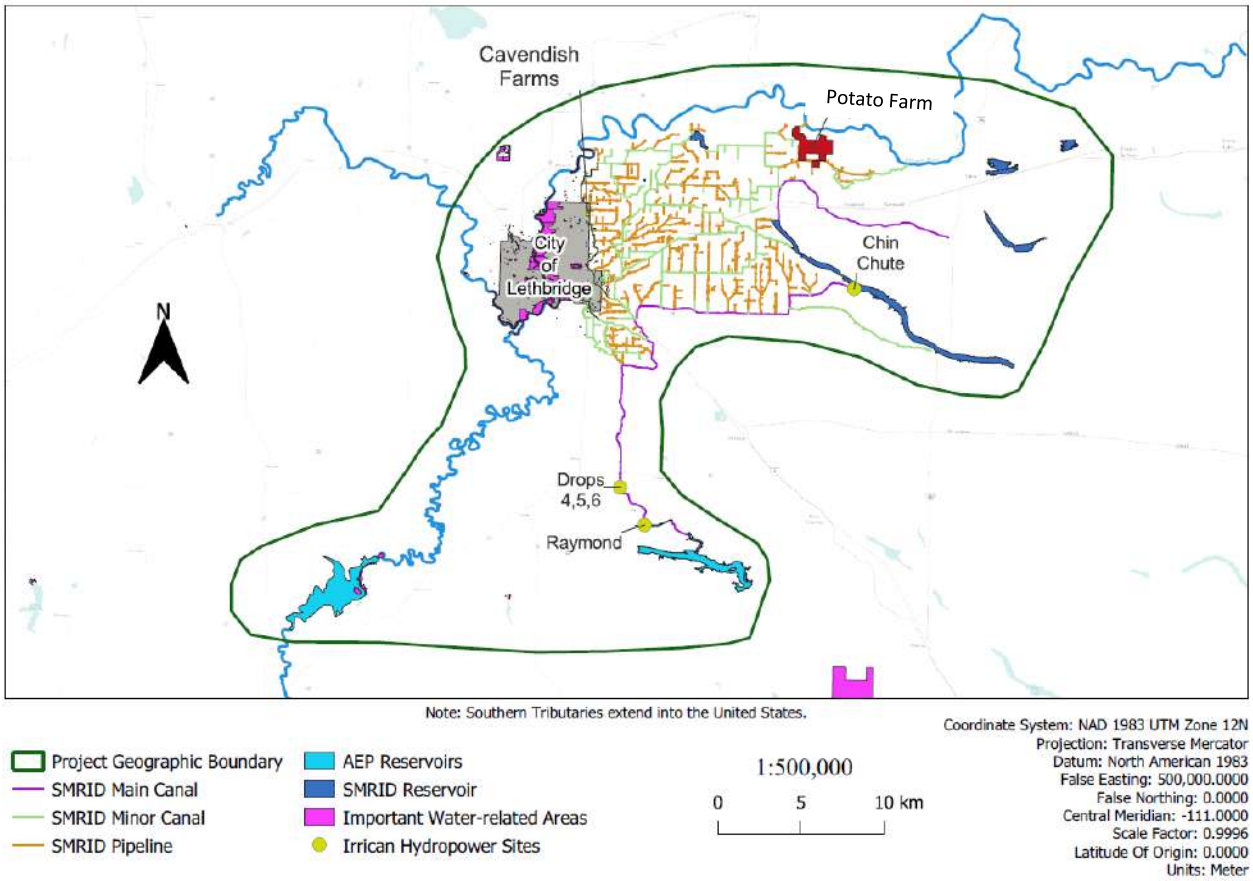

Figure 4: Map displaying the defined project geographic area for the AWF project.

Water quantity

This section addresses **a portion of** AWS Criterion 1.5 "*Gather water-related data for the watershed.*"

Indicator for Criterion 1.5 **that is addressed** is:
"*1.5.3 - The catchment water-balance, and where applicable, scarcity, shall be quantified, including indication of annual, and where appropriate, seasonal, variance.*"

Water Quantity Context of the Oldman River

Both surface water and groundwater can be evaluated for water quantity and availability. In the Oldman River watershed, surface water is the predominant water source for human uses, with less than 1% of the total water license allocations in the basin issued for groundwater (Government of Alberta 2021). For the AWF project, groundwater is not considered because the AWF implementers rely on surface water.

As noted above, the naturally available water in the Oldman River is mainly determined by the amount of snowmelt and precipitation in the headwaters, which is the area of the watershed with the greatest amount of precipitation (Oldman Watershed Council 2010). Therefore, flow in the Oldman River is naturally highest in the spring, due to snowmelt runoff, and lowest in the late summer.

The St. Mary, Waterton, and Belly rivers are three of the main tributaries to the Oldman River. The headwaters of these three rivers are located in Glacier National Park, Montana (Oldman Watershed Council 2010).

The water quantity in the Oldman River watershed is highly managed, with several major reservoirs capturing snowmelt and releasing it through the year based on the needs of downstream water users. The Oldman River basin has a variety of human water users, including irrigation, industry and municipal use. The differences in allocation for each water use can be seen in Figure 5.

The reservoirs are managed so that water is available for users through the naturally low flow times of the year. If precipitation and snow melt are minimal over multiple years, the reservoirs may not have enough water to meet all water user's demands resulting in challenging drought conditions. The Oldman River watershed has experienced severe drought and flooding events in the past, and the reservoirs play a key role in mitigating both (Oldman Watershed Council 2010).

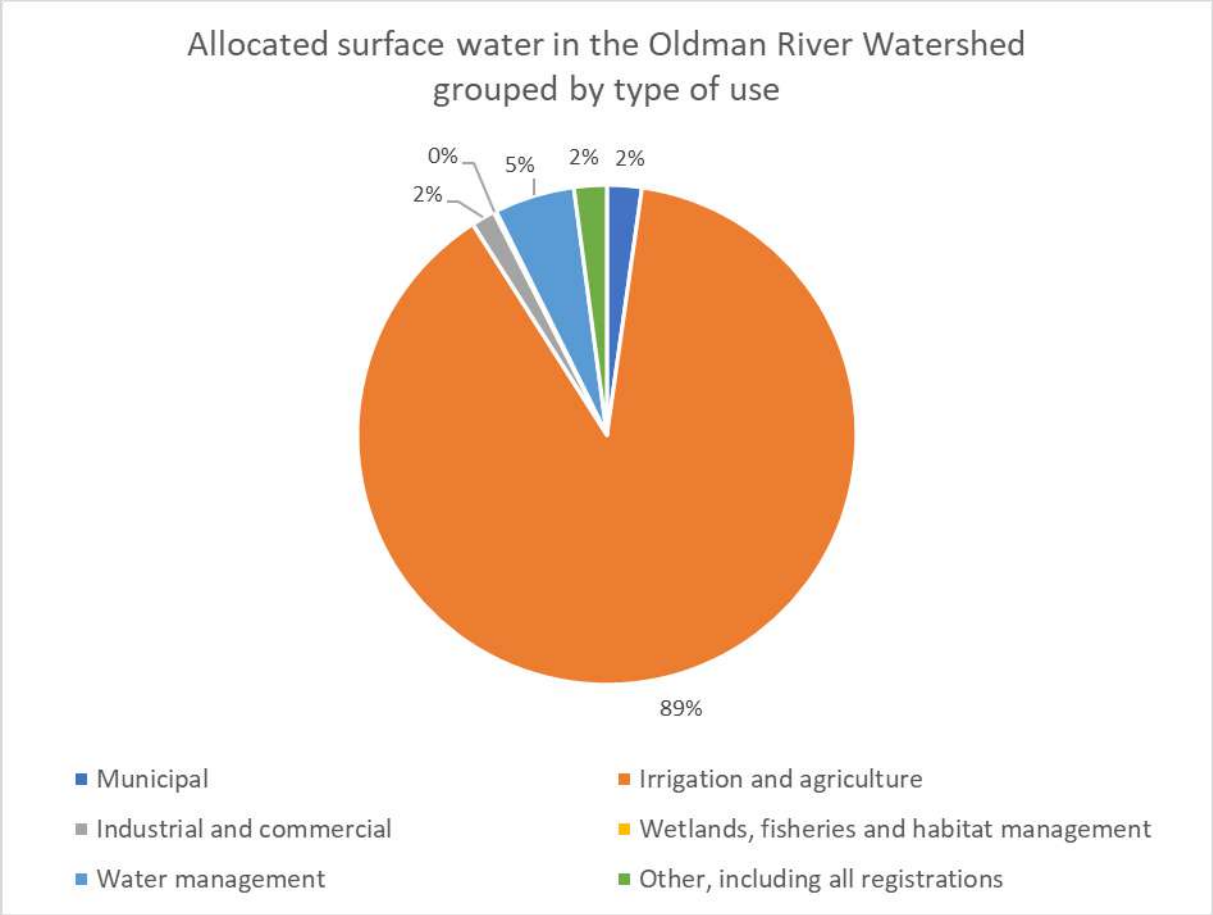

Figure 5. Allocated surface water in the Oldman River watershed grouped by type of use (data source (Government of Alberta 2021)

The total licensed volume in surface water licenses for the Oldman River watershed is 2.25 billion m^3/year (Government of Alberta 2021), which means that approximately 66% of the naturally available water is allocated for users in the watershed.

Because the project geographic area is in the downstream portion of the watershed, water available for human use and instream flows for the environment is largely dependent on how water is managed upstream on the Oldman River mainstem and its major tributaries. This section focusses on key upstream factors at a high-level, as well as the project geographic area specifically.

Project Geographic Area context

Water availability in the AWF project geographic area (Figure 4) is ultimately determined by the snowmelt at the headwaters of the Oldman River. Specifically, water quantity in the AWF project geographic area is determined by the water held in and released from the reservoirs upstream. Reservoirs upstream of the project geographic area of note include the St. Mary Reservoir, the Waterton Reservoir, and Ridge Reservoir. The St. Mary Reservoir and Waterton Reservoir are operated by the Government of Alberta, while the diversion gates from the Ridge Reservoir are operated by the SMRID.

The climate in this region is significantly drier than the upstream areas of the watershed, with between 300mm and 450mm of precipitation per year in different parts of the region (Oldman Watershed Council 2010). The temperatures vary significantly through the year, and frequently windy conditions can also contribute to loss of moisture. Summers are sunny, hot, and dry, with three to four months of growing season. Rich soils make for good agricultural growing conditions, with water as a limiting resource (Oldman Watershed Council 2010). The mean annual natural discharge of the Oldman River measured near Lethbridge from 1912-2001 is 3.4 billion m^3 (Oldman Watershed Council 2010).

Though the Oldman River mainstem at Lethbridge has no significant trends in changes to natural flow (Oldman Watershed Council 2010), simulated climate and streamflow models for the Oldman River indicate lower annual flows and a greater probability of extreme low flows in the future. Projections for the period of 2025-2054 found that there is a 60% chance that daily stream flow will not exceed 104.4 m^3/s. This projected flow is significantly lower than the historical period of 1912-2009, where there was a 60% chance that daily stream flow did not exceed 116.4 m^3/s (WaterSMART Solutions Ltd. 2014).

Climate change projections anticipate that precipitation events in the Basin are likely to become more variable and unpredictable in the future, leading to events such as floods, droughts, and wildfires (Durack, Wijffels and Matear 2012). A striking example is the catastrophic flood events of June 2013, which cost an estimated $6 billion, and in economic terms was considered the worst natural disaster in Alberta's history (McClure 2015). Additionally, projections indicate that summer flows are expected to decrease due to an increase in winter snowmelt (Western Economic Diversification Canada 2020). These changes within the basin will have implications for reservoir and irrigation management (Stewart, Cayan and Dettinger 2005). The Oldman River Basin therefore needs to be resilient and adaptable in responding to a wide range of future climate and stream flow variability.

Within the project geographic area, the Oldman River has a Water Conservation Objective (WCO) in place. The WCO is a regulatory tool that ensures a minimum amount of water in the river for environmental needs, and it requires water to be released from upstream reservoirs to support this minimum flow. See the section in this report titled *Regulatory system and water management authorities* for more information about the WCO for the Oldman River mainstem.

Multi-year droughts have had significant impacts on the region in the past, which have resulted in the implementation of water sharing agreements. For example, a large number of water users committed to sharing the available water during a multi-year drought in 2000-2001. Additionally, irrigation water users

in the area have an established system of sharing water through the irrigation districts who supply available water to their members.

Catchment Water Balance

The AWS Standard requires understanding the catchment water balance as a way to help identify increasing water scarcity. The water balance is an assessment of inflows and outflows, as well as storage in the system over a period of time (Alliance for Water Stewardship 2020). The equation defined by the AWS Standard is simplified, especially for the system of an entire catchment. Additional factors such as evaporative losses and consumptive water use can be included. As the name suggests, the equation should balance at least approximately. The catchment water balance is defined by the equation:

(Water outflow) = (Water inflow) + (Change in storage volume)

The estimated naturalized annual flow in the Oldman River is 3.5 billion m^3/year (Government of Alberta 2004). This is a long-term average calculated based on the data recorded since 1914 and adjusted to account for the effects of licensed diversions and reservoirs. The reservoirs in the Oldman River watershed (including the St. Mary, Waterton, and Oldman reservoirs) provide control over the river flow and mitigate drought and flooding. The reservoirs also increase the surface area of water and therefore increase evaporative losses, reducing the total volume of water available over the year. The recorded data shows a decrease in the annual flow volume over time compared to the naturalized series. This can be attributed to the increased consumption and water infrastructure operations upstream of Lethbridge (Government of Alberta 2004).

The authority governing water balance by managing the infrastructure is Alberta Environment and Parks (AEP). Snow and streamflow monitoring is done by AEP using monitoring stations placed on the major rivers and their tributaries. Current water availability data is provided by AEP to its licensed users, as well as predictions of availability for the coming season. These data can also be accessed publicly from Alberta Rivers (Alberta Environment and Parks), which are updated on a monthly basis. See the *Regulatory system and water management authorities* section for further explanation of AEP and regulatory mechanisms for water management in Alberta.

Water source reliability

Water is provided for the Oldman River at the headwaters in the Rocky Mountains, while the headwaters of the Waterton, Belly and St. Mary rivers are in Montana (Oldman Watershed Council 2010). Water availability in Alberta is determined through monitoring by the Government of Alberta.

Water availability of sources originating in the USA, such as the Belly, Waterton and St. Mary rivers, is governed by international agreements between the USA and Canada. These agreements are the Boundary Waters Treaty of 1909 and the International Joint Commission (IJC) Order of 1921, which apportion water from transboundary water bodies between the two nations (Government of Alberta 2020). The IJC is an international organization with representation from the United States and Canada that works to “provide direction on measurement and apportionment” for transboundary waters between the two countries (International Joint Commission 2020). As mandated by the IJC Order of 1921, the Water Survey of Canada and the United States Geological Survey monitor flow volume every 15 days (Government of Alberta 2020). Typically, more water is received in Canada than is strictly required based on the agreements for these transboundary waterways.

Water quality

This section addresses **a portion of** AWS Criterion 1.5 "*Gather water-related data for the watershed.*"

Indicator for Criterion 1.5 **that is addressed** is:
"*1.5.4 - Water quality, including physical, chemical, and biological status, of the catchment shall be identified, and where possible, quantified. Where there is a water-related challenge that would be a threat to good water quality status for people or environment, an indication of annual, and where appropriate, seasonal, high and low variances shall be identified.*"

Water quality at the headwaters

Water quality in the headwaters of the Oldman River is generally high, with the majority of headwater stream flow sourced from snow or glacier melt. The headwaters region in the Oldman River has limited impacts from urban and industrial activities, due to low levels of development in those areas. Additionally, several areas of the headwaters are protected from many activities and forms of future development by national or provincial park designations.

General water quality in the region

Though the water is of high quality at the headwaters of the Oldman River, water quality tends to degrade in the lower reaches of the river due to the impacts of municipal, agricultural and industrial land use. Phosphorus and nitrogen concentrations have been shown to increase in the main stem of the Oldman as the river passes through agricultural regions (Howery 2010). While these major indicators continue to be monitored, monitoring has shown that nitrogen and phosphorous concentrations in the Oldman River mainstem are within provincial water quality guidelines (Oldman Watershed Council 2010). Fecal coliforms and E. Coli were also shown to increase near grazed lands, and more significantly when water samples were taken immediately after larger rainfall events (Hyland, et al. 2003). While there have been fecal coliform guidelines exceedances in the Oldman River mainstem, these events are uncommon (Oldman Watershed Council 2010).

Watershed stakeholders

This section addresses AWS Criterion 1.2 *"Identify stakeholders and their water-related challenges".*

Indicators for Criterion 1.2 include:
"1.2.1: Stakeholders and their water-related challenges shall be identified. The process used for stakeholder identification shall be identified.
1.2.2: Current and potential degree of influence between site and stakeholder shall be identified, within the catchment and considering the site's ultimate water source and ultimate receiving water body for wastewater."

Relevant stakeholders for water stewardship are determined by the implementer, their location, and their impacts. For this watershed context, the initial screening level list of stakeholders captures those who are potentially relevant for the three AWF project implementers. This list of stakeholders is based on the

physical location of the project geographic area, and the water users sharing the same source of water as the implementers.

Stakeholders and water related challenges

In any agri-food supply chain, there are a number of individuals and/or organizations that are relevant stakeholders to the water stewardship of the supply chain. However, stakeholders have different levels of interest and influence, depending on their involvement in the supply chain and their power within society. Table 1 (below) is a starting point list of stakeholders that are relevant in the Oldman River Watershed and water stewardship practices. This list is refined further for each implementer specific to their operation, location, and the potato supply chain, which is the focus of the AWF project. The list in Table 1 is not exhaustive but provides the reader with an understanding of the number of potential players that should be engaged when considering water stewardship for an agri-food supply chain.

Stakeholders were suggested using the matrix shown in Figure 6 (below), which considers stakeholder influence, interest and engagement in the given region.

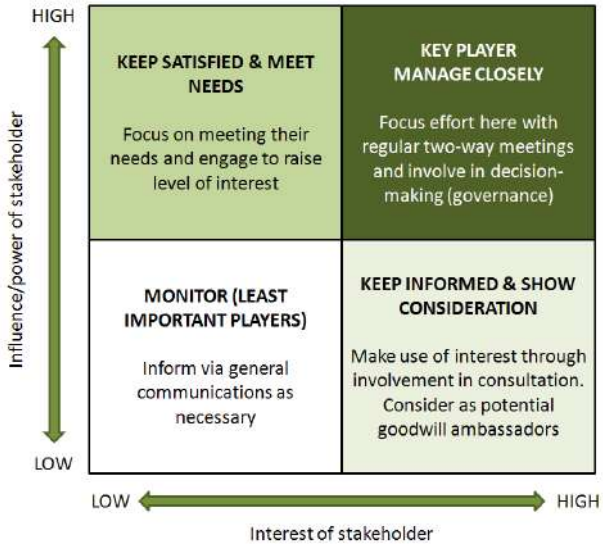

Figure 6: Stakeholder power, interest and engagement matrix (Alliance for Water Stewardship 2020).

Table 1: Starting point list of relevant stakeholders in the Oldman River Watershed for the AWF project

Potential Stakeholder
Alberta Agriculture and Forestry - Provincial Government Department
Alberta Environment and Parks - Provincial Government Department
Alberta Tourism and Rec - Provincial Government Department
Alberta Irrigation District Association
Alberta Conservation Association
Alberta Wheat Commission
BASF (Canola)
Blood Tribe no. 148
Canadian Food Inspection Agency
Cardston County

Cavendish Farms
City of Lethbridge
Ducks Unlimited
Lethbridge County
Lethbridge Fish and Game
Lethbridge North Irrigation District
Magrath Irrigation District
Municipal District of Taber
Newell County
Oldman River Chapter of Trout Unlimited
Oldman Watershed Council
Potato Growers of Alberta
Pulse Growers of Alberta
Raymond Irrigation District
Restaurant buyers
Retail buyers
SMRID
SMRID (western portion) members/rate payers
SMRID central and east members/rate payers
Taber Irrigation District
Town of Taber
Vulcan County
Warner County

Shared water challenges

This section addresses AWS Criterion 1.6 *"Understand current and future shared water challenges in the watershed"*

Indicators for Criterion 1.6 include:
"1.6.1: Shared water challenges shall be identified and prioritized from the information gathered.
1.6.2: Initiatives to address shared water challenges shall be identified."

There are several water-related challenges that are common among water users in the Oldman River basin. The previous sections that discuss the basin's geographic context, regional water quality and water quantity provide background and research on the shared water challenges that will be discussed in this section. Shared water challenges are defined by AWS as challenges that are "shared by the site and one or more relevant stakeholders" (Alliance for Water Stewardship 2020). There may be additional challenges identified through the stakeholder engagement process.

As the Oldman River basin is in an arid region, water must be carefully managed to ensure there is enough for people, for the environment and for a successful economy. Due to the amount of water already allocated for use in the region, the Oldman River and its tributaries are closed to new surface water licence applications. Best water management practices are key to the success of the region.

Table 2 below is a draft list of water challenges shared by multiple users in the Oldman River watershed. This table will be updated and refined to reflect the challenges and concerns that are identified through the stakeholder engagement process of the AWF project. These shared challenges will inform the water stewardship implementation actions of the AWF project implementers.

Table 2: Shared water challenges in the Oldman Basin identified in the initial research of the AWF project

Priority	Challenge	Catchment-level management
	Water security	- Drought response approach in the South Saskatchewan River Basin Water Management Plan - Water sharing agreements during times of drought (Water Act, section 33)
	Water quality	- Stream flow monitoring, the Water Conservation Objective and Instream Flow Needs - Oldman River Basin Water Quality Initiative
	Declining ecological health	- Instream flow needs (IFN) - Whirling disease and invasive species - Monitoring westslope cutthroat trout population in upper reach of Oldman River - Operations of the Oldman River Dam (ORD)
	Adapting to Hotter and Drier Future	- Simulation modelling
	Contaminants	- Emerging Contaminants of Concern

Important water-related areas

This section addresses **a portion of** AWS Criterion 1.5 "*Gather water-related data for the watershed.*"

Indicator for Criterion 1.5 **that is addressed**:
"1.5.5: Important Water-Related Areas shall be identified, and where appropriate, mapped, and their status assessed including any threats to people or the natural environment, using scientific information and through stakeholder engagement."

This section identifies the Important Water-Related Areas (IWRAs) that fall within the project geographic area. The site-specific IWRAs, if applicable, are dealt with in the Watershed Stewardship Plan document for each implementer.

The area must link to water in some way to be considered an IWRA. An IWRA is defined as an area or feature that, if impaired or lost, would adversely impact the environmental, social, cultural or economic benefits derived from the catchment in a significant or disproportionate manner. Although the term 'important' is subjective, the IWRAs are identified through research and engagement with local stakeholders. The term 'water-related' is intentional and it refers not only to areas that contain a natural

waterbody, but also areas that rely on water for their condition and protection, but which may be dry for much of the year.

The most obvious IWRAs for this project are the original water diversion points for the water sources of the implementers. Those diversion points are the Ridge Reservoir and the intake for the City of Lethbridge municipal water treatment plant. These two locations provide water to numerous other water users in addition to the implementers.

The Oldman River Valley from Lethbridge to the confluence with the Little Bow River is deeply cut below the Prairie plain and has deep coulees running down to the river. That area falls within the project geographic area and is recognized as an environmentally significant area. The coulee ecosystems and riparian areas are key nesting places for birds, including prairie falcons, golden eagles and ferruginous hawks (Oldman Watershed Council 2010).

There are multiple areas within the City of Lethbridge that have been identified as culturally significant by the Blackfoot Confederacy. The Indian Battle Park, Bull Trail Park, Popson Park, Pavan Park, the Turtle Effigy located on the West Lethbridge Prairie upland, and many other sites within the City of Lethbridge are identified in the 2017 report "Traditional Knowledge and Use Assessment, City of Lethbridge" by the Blackfoot Confederacy Nations of Alberta in association with Arrow Archeology Ltd. (The Blackfoot Confederacy of Alberta in association with Arrow Archaeology Ltd. 2017).

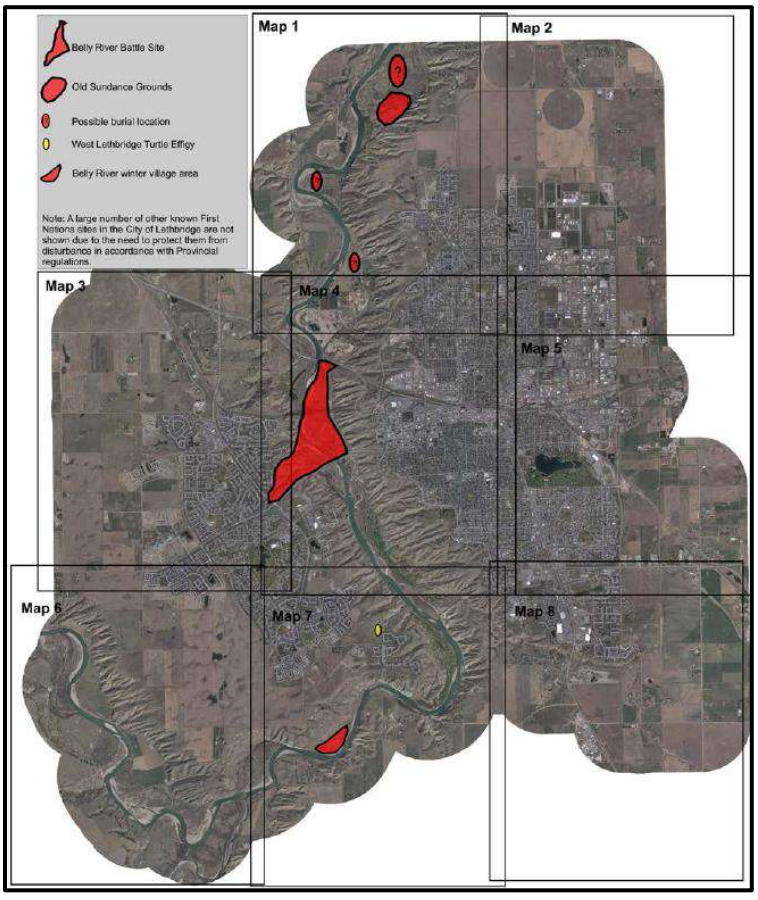

Figure 7. Historical site locations from the Traditional Knowledge and Use Assessment, City of Lethbridge (The Blackfoot Confederacy of Alberta in association with Arrow Archaeology Ltd. 2017).

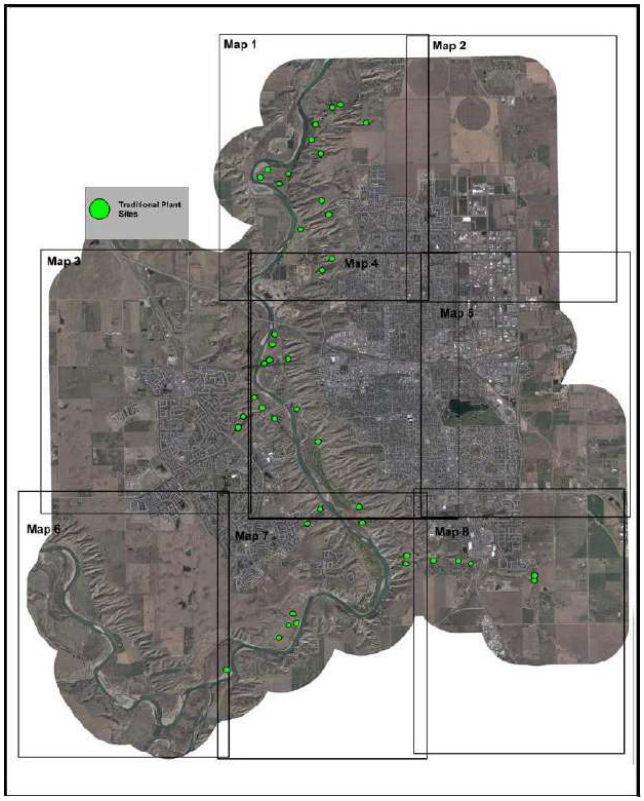

Figure 8. Select plant locations from the Traditional Knowledge and Use Assessment, City of Lethbridge (The Blackfoot Confederacy of Alberta in association with Arrow Archaeology Ltd. 2017)

Within the City of Lethbridge there is a network of connecting city parks that protect much of the river valley and riparian areas through the city limits. Several of these are designated as protected parks because of their ecosystem services. The Elizabeth Hall Wetlands and the Hellen Schuler Nature Reserve are two examples. See Figure 4 earlier in this report for an indication of where these parks are located, in the map legend the parks are referred to as Important Water-Related Areas, identified in pink.

Regulatory system and water management authorities

This section addresses **a portion of** AWS Criterion 1.5 "*Gather water-related data for the watershed.*"

Indicators for Criterion 1.5 **that are addressed** include:
"1.5.1: Water governance initiatives shall be identified, including catchment plan(s), water-related public policies, major publicly-led initiatives under way, and relevant goals to help inform site of possible opportunities for water stewardship collective action.
1.5.2: Applicable water-related legal and regulatory requirements shall be identified, including legally-defined and/or stakeholder-verified customary water rights."

The *Water Act* is the central piece of legislation governing water in the province of Alberta. The *Water Act* provides tools, orders and authority for management of water resources. It supports and promotes water

conservation and management of water through the use and allocation of water. Alberta Environment and Parks (AEP) delivers the *Water Act* mandate, manages reservoir ownership and operations, and regulates impacts to water quality under the *Environmental Protection and Enhancement Act* (EPEA), for all water matters not associated with oil, gas, coal and pipelines.

In addition to the *Water Act*, numerous policies and other pieces of legislation provide direction and limit activities related to water. Below are descriptions of several of them. The *Approved Water Management Plan for the South Saskatchewan River Basin* (2006) made various recommendations including to close the Bow, Oldman and South Saskatchewan River sub-basins to new applications and to designate WCOs on the mainstem rivers and their tributaries. The *Bow, Oldman, and South Saskatchewan River Basin Allocation Order* was issued in 2007 as a regulation under the Water Act that implemented the recommendations of the *Approved Water Management Plan*.

Water Conservation Objectives (WCOs) are established under the *Water Act* as a regulatory tool for balancing human and environmental needs for water flows. Water allocation licenses can include conditions that determine minimum flows that must be present before water can be diverted in order to protect the aquatic ecosystem. WCOs affect flows by governing the amount of water that must be released from a dam, when a license holder can divert water, and by guiding government officials on decisions about when water can be allocated, and the amount of water needed for flow restoration.

WCOs do not guarantee the designated WCO volume of water remains in the water course, as some licensees are not subject to a WCO condition and may withdraw water when a WCO threshold is surpassed. There are WCOs for the SSRB, recommended as part of the *Approved Water Management Plan for the South Saskatchewan River Basin*. For the Oldman River mainstem below the Oldman River Dam to the confluence with the Bow River, the WCO is either 45% of the natural flow or the existing instream objective increased by 10%, whichever is greater at any point in time. For the headwater reaches of the Oldman River, the existing instream objective is the WCO (Alberta Environment and Parks, 2019).

Another key legislative piece is the Master Agreement on Apportionment (1969), which outlines how the governments of Alberta, Saskatchewan, Manitoba and Canada share the waters of eastward flowing interprovincial streams. The agreement requires that at minimum 50% of the annual flow by volume of the headwaters of the eastward-flowing provincial watercourses must be passed from Alberta to Saskatchewan.

Water for Life strategy and action plan (2003) affirmed Alberta's commitment to the wise management of the province's water resources for the benefit of all Albertans.

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Appendix F: Framework for the AWS Standard

Site Water Stewardship Framework Guidance

A guidebook to water stewardship for an agri-food processor site, irrigation district, and other operations in the ag and agri-food supply chain.

Rationale for water stewardship

Water stewardship is the use and safeguarding of fresh water that is socially equitable, environmentally sustainable, and economically beneficial.

Being a better water steward requires understanding the context for the water your site uses, and taking action based on that.

<u>Why pursue water stewardship?</u>

- Prepare for and manage risks to your operation
- Demonstrate sustainable resource management to your buyers
- Build beneficial relationships and trust with your local community
- Strengthen relationships with regulatory agencies
- Save money

What does water stewardship entail?

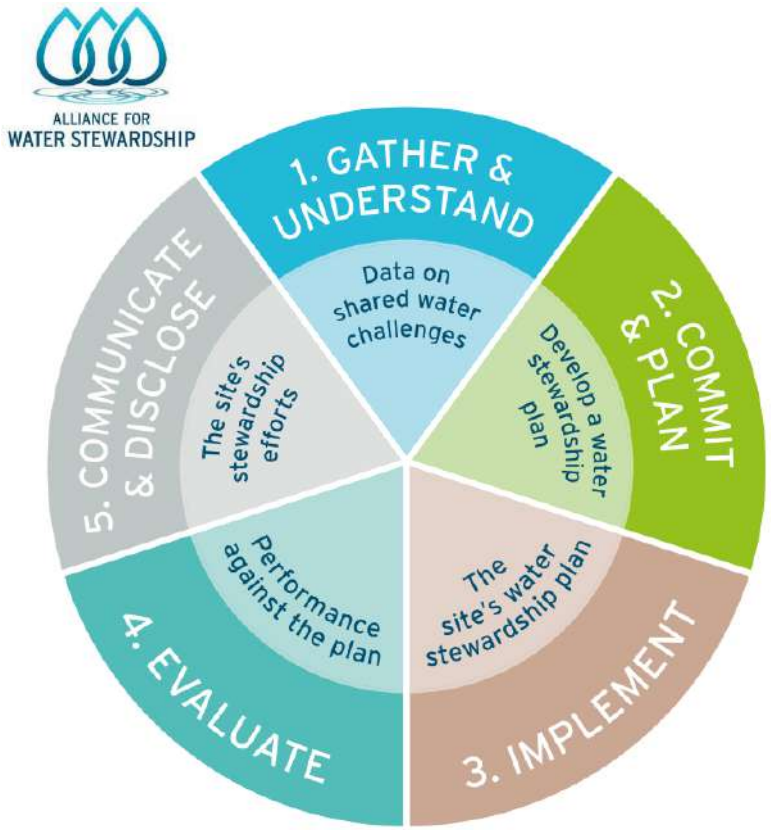
Water stewardship is based on five objectives;

1. Good water governance
2. Responsible water use
3. Good water quality
4. Healthy sensitive areas like wetlands (Important Water-related Areas)
5. Safe water, sanitation and hygiene for all

- The Alliance for Water Stewardship (AWS) has worked to describe the steps to good water stewardship in detail
- AWS has produced an internationally recognized standard of water stewardship, which includes many criteria to follow
- You do not have to meet all the criteria to be a water steward
- Selecting a subset of AWS criteria can still be beneficial for your operation and the watershed

A framework based on the Alliance for Water Stewardship Standard

The AWS standard framework includes 5 key steps[1], which align with ISO 14001[2], etc.



2

ENVIRONMENTAL MANAGEMENT SYSTEMS

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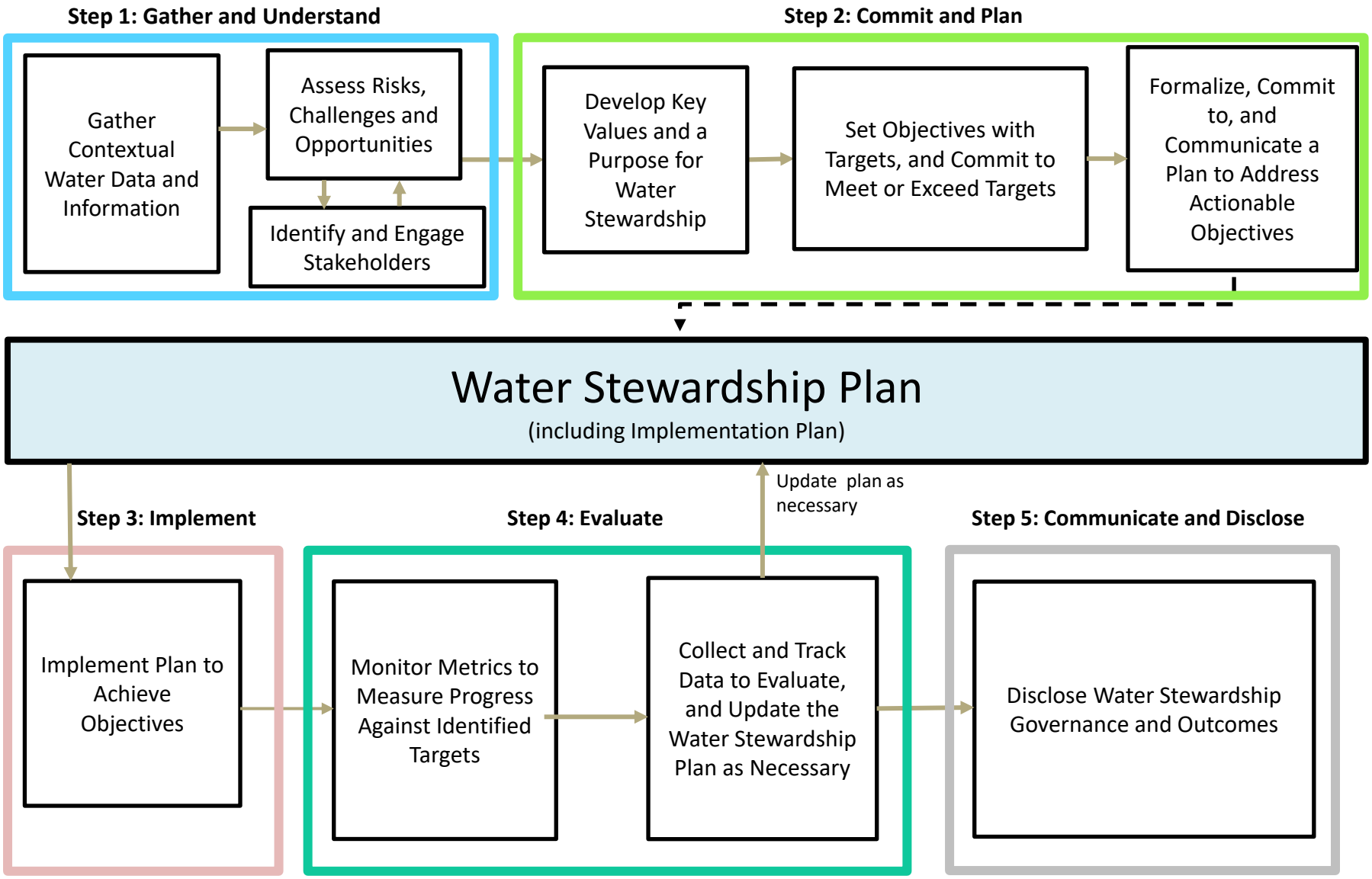
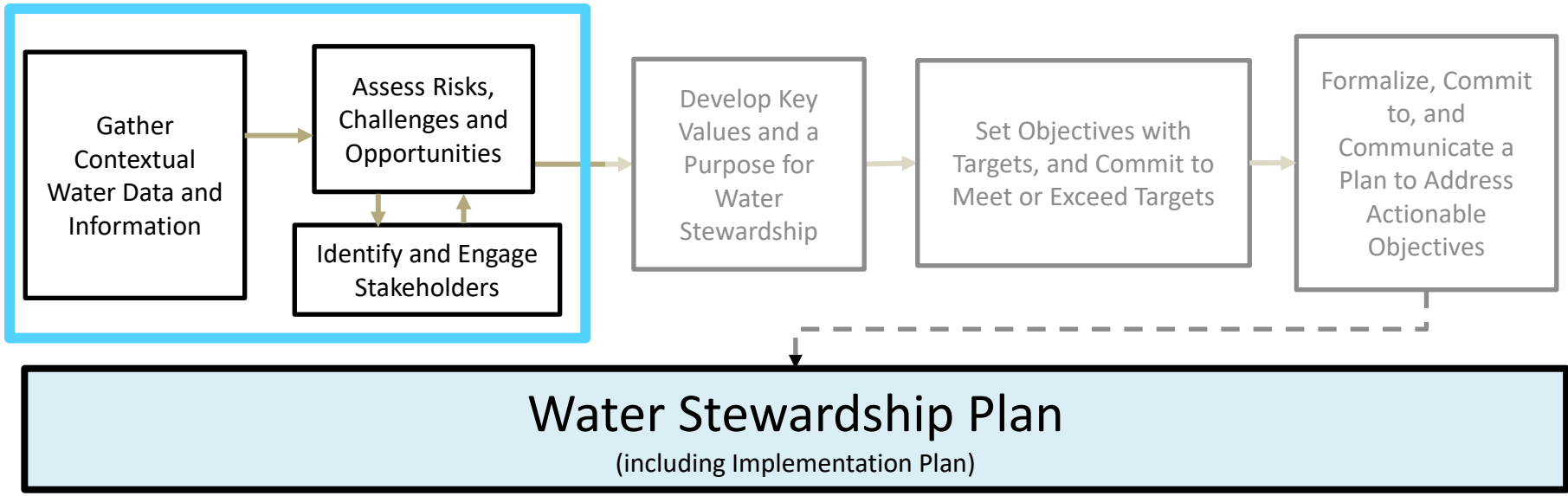
Process Diagram for Water Stewardship



Gather and Understand



- Gather contextual water information about the site's water use and water on-site (water quality, quantity, challenges, and governance for the site)
- Understand the watershed context including geography, water quality, quantity, challenges and governance
- Identify and engage relevant stakeholders to understand their water concerns and the potential impacts and opportunities within the watershed
- Assess risks, challenges and opportunities (which can be associated with water supply, watershed health, corporate image, etc.)

Components of the water stewardship plan

- **Watershed context report**
- **Stakeholder engagement**
- **Risks and Opportunities table**

Gather and Understand

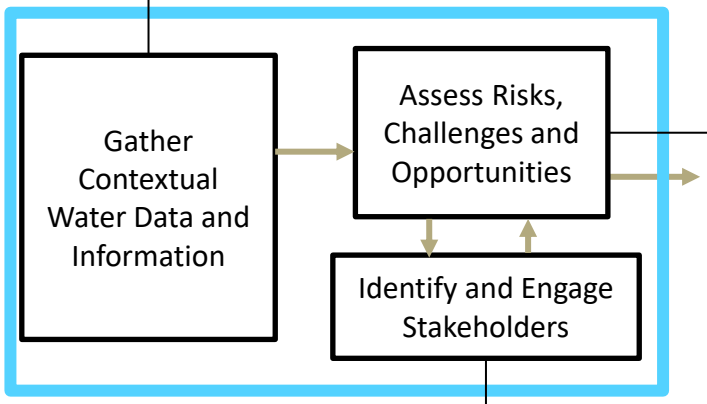
Process recommendations and learnings

Setting up realistic expectations

- Recommendations
  - Use existing maps and site plans as much as possible
  - Start with some of the stakeholders and then contact additional stakeholders after the first round, not all need to be identified and contacted all at once
  - Identifying site risks and opportunities should be an iterative process
  - Think about the site risks, opportunities and implementation actions all together, document them in a way that shows the links/connections between them
  - If not pursuing full conformance to AWS Standard, document information you have directly against the selected criteria
  - If opting to follow the AWS Standard then document information you have directly against all the AWS criteria

- Time and resourcing requirements
  - This part of the water stewardship standard process is time consuming
  - Someone needs to have ownership over the process of compiling information and becoming familiar with the AWS Standard criteria and guidelines

Gather and Understand



Gather Contextual Water Data and Information

AWS Criteria Met

1.1 (1.1.1, 1.1.2, 1.1.3, 1.1.4)

1.3 (1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 1.3.7, 1.3.8)

1.4 (1.4.1, 1.4.2)

1.5 (1.5.1, 1.5.2, 1.5.3, 1.5.4, 1.5.5, 1.5.6, 1.5.7)

1.8 (1.8.1, 1.8.2, 1.8.3, 1.8.4, 1.8.5)

Identify and Engage Stakeholders

AWS Criteria Met

1.2 (1.2.1)

2.1.1.3

Assess Risks, Challenges and Opportunities

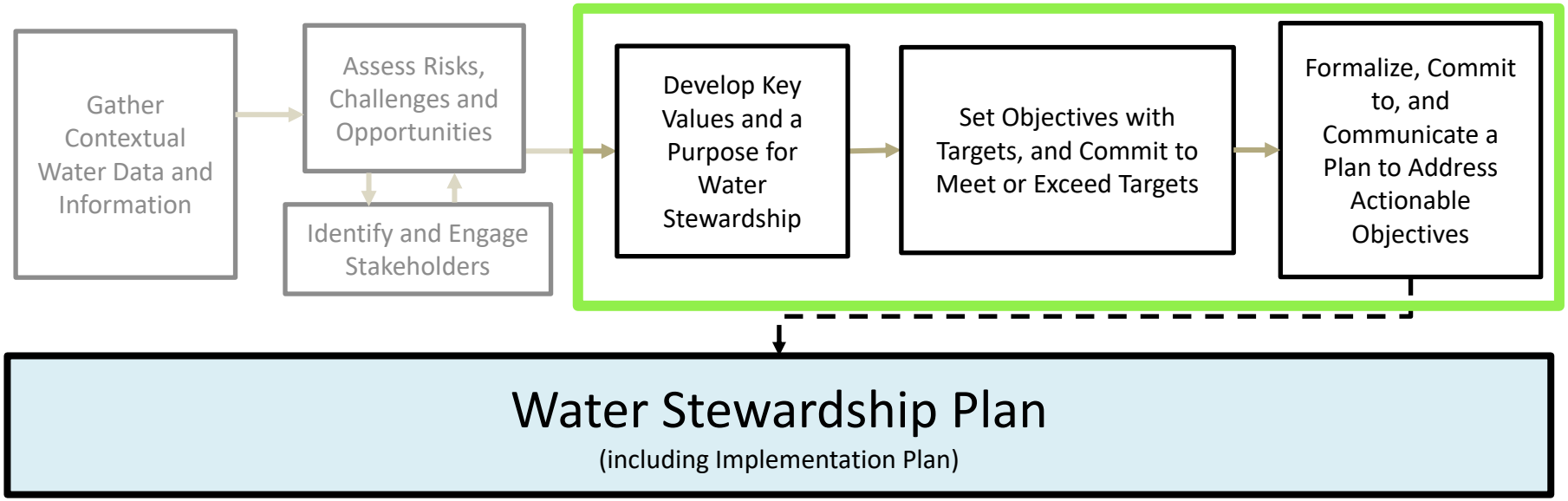
AWS Criteria Met

1.6 (1.6.1, 1.6.2)

1.7 (1.7.1, 1.7.2)

This fully covers the criteria in Step 1 of the AWS Standard.

Commit and Plan

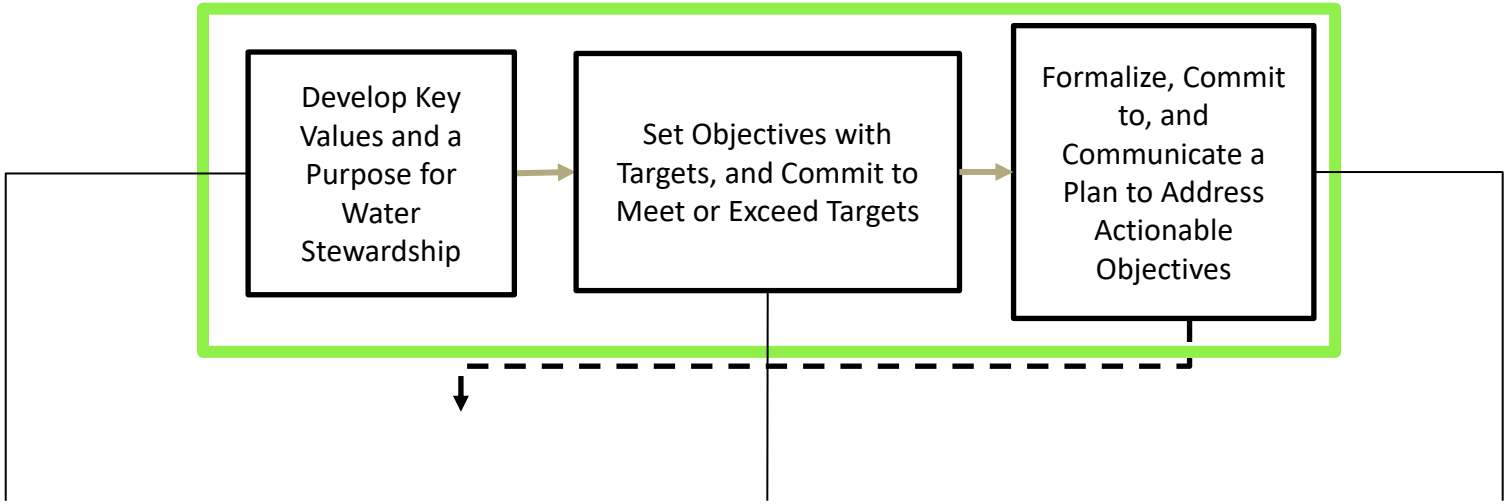


- Define and commit to water stewardship through a purpose statement – an over-arching statement on water stewardship that aligns with the company's core values
- Define the objectives, actions and outcomes of your water stewardship plan based on the understanding of the contextual information gathered
- Develop and formalize the Water Stewardship Plan with implementation actions identified

Components of the water stewardship plan

- **One-page summary**
- **Implementation Plan**

Commit and Plan



Develop Key Values and a Purpose for Water Stewardship

AWS Criteria Met

2.1 (2.1.1, 2.1.2)

Set Objectives with Targets, and Commit to Meet or Exceed Targets

AWS Criteria Met

2.2 (2.2.1)

Formalize, Commit to, and Communicate a Plan to Address Actionable Objectives

AWS Criteria Met

2.3 (2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5)

2.4 (2.4.1, 2.4.4)

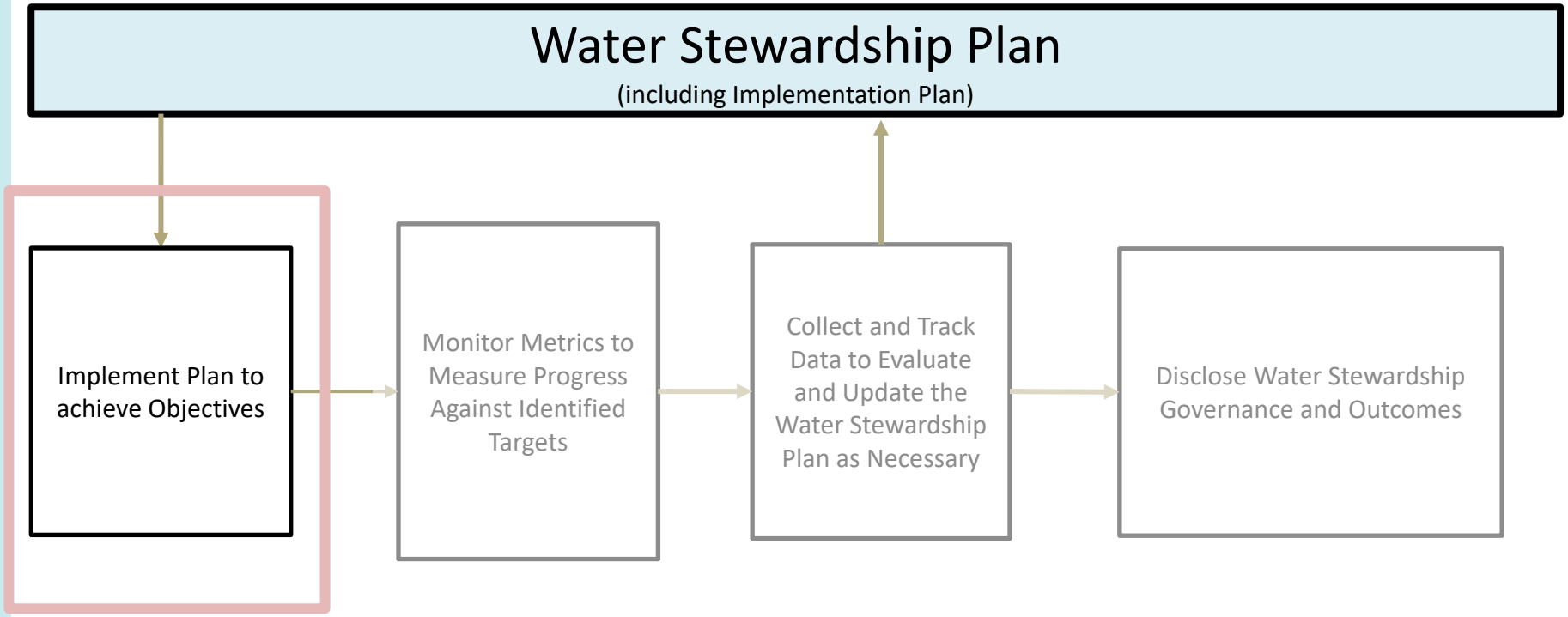
This fully covers the criteria in Step 2 of the AWS Standard.

Commit and Plan

Learnings from the project

- Recommendations
  - Projects that are already underway or in the late planning stages can be included as appropriate
  - Capture all the ideas for actions and the ones that cannot be completed in the initial implementation work can be recorded in a list of long term potential actions
- Timing
  - Some of the finalization of the plan may be done concurrently with starting on implementation actions

Implement

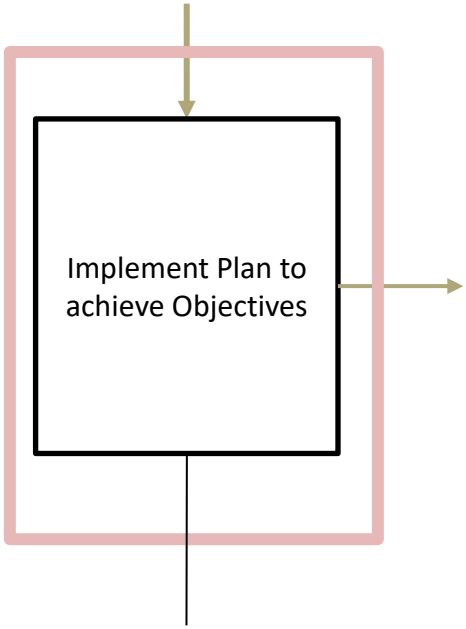


- Develop an approach to implement the actions in the Water Stewardship Implementation Plan
- Identify metrics to understand if the objectives are being met and develop systems for monitoring and measuring against the metrics and reporting on them to internal audiences (e.g. management)
- Conduct the actions

Components of the water stewardship plan

- **Implementation Plan**

Implement



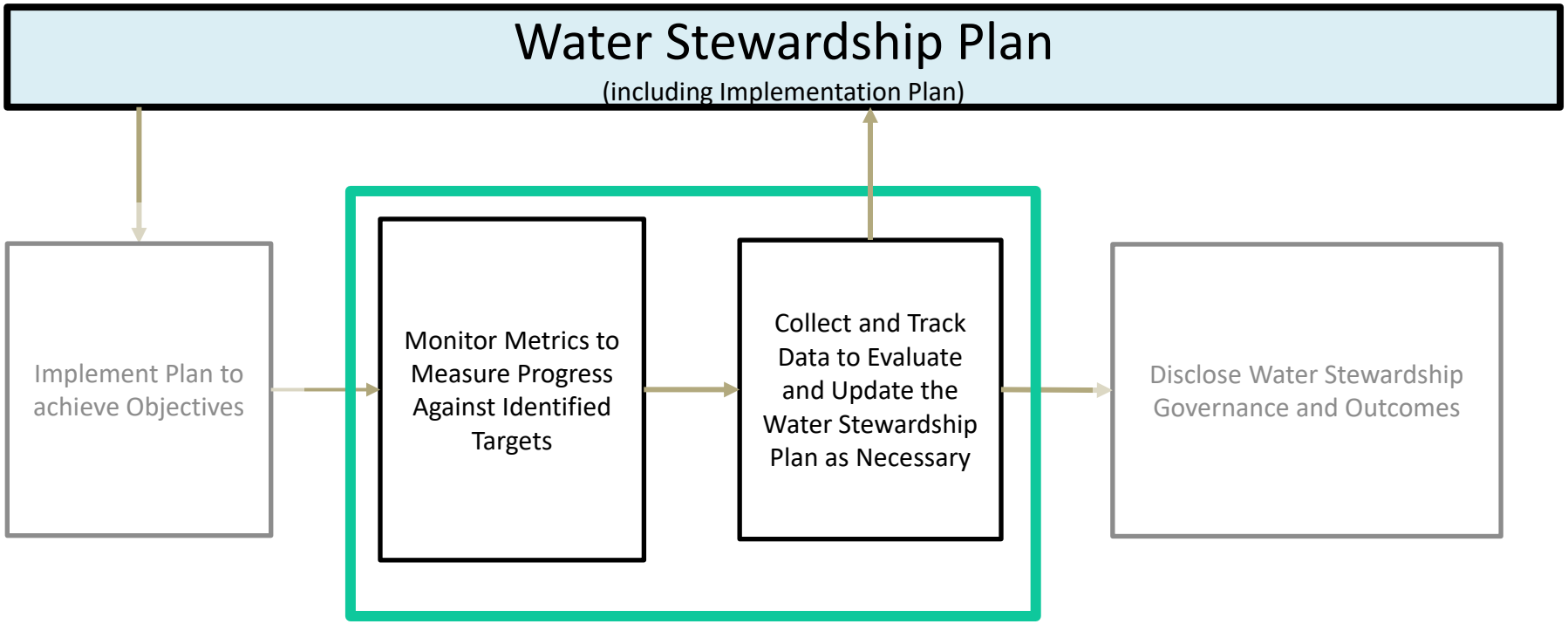
Implement the water stewardship plan to achieve objectives

AWS Criteria Met

3.1 (3.1.1, 3.1.2)
3.2 (3.2.1, 3.2.2)
3.3 (3.3.1, 3.3.2, 3.3.3)
3.4 (3.4.1, 3.4.2)
3.5 (3.5.1)
3.6 (3.6.1, 3.6.2)
3.7 (3.7.1, 3.7.2)
3.8 (3.8.1)
3.9 (3.9.1, 3.9.2, 3.9.3, 3.9.4, 3.9.5)

This fully covers the criteria in Step 3 of the AWS Standard.

Evaluate

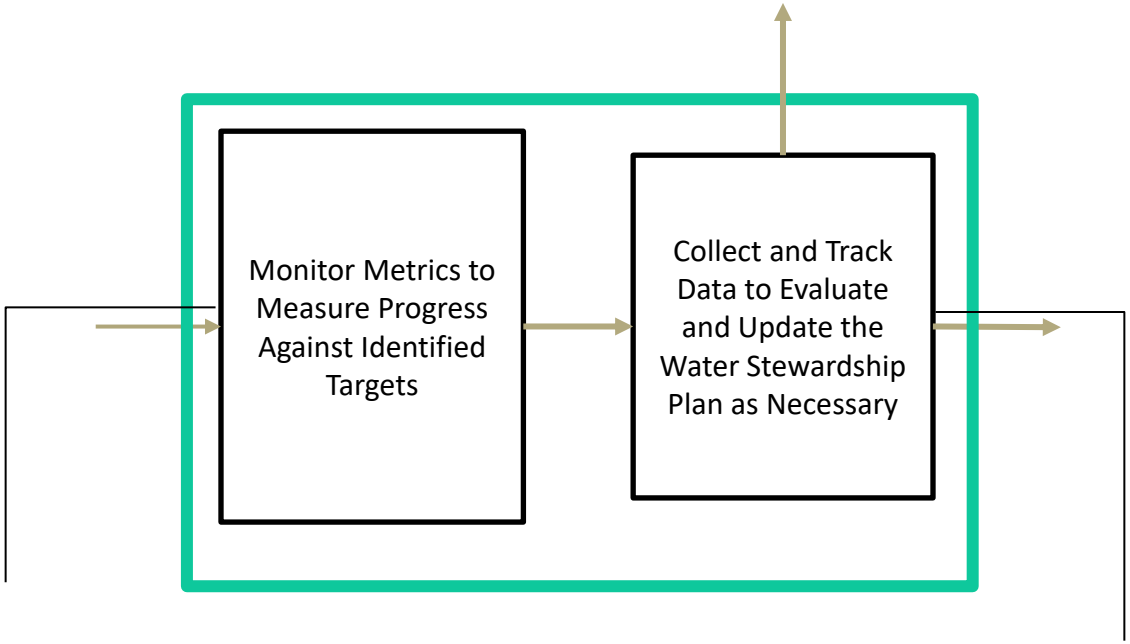


- Targets are measured using metrics
- Evaluate the progress of the water stewardship plan based on targets and metrics and update them as appropriate
- Feedback allows continuous improvement of operations

Key Documents

- **Metrics tracking document**

Evaluate



Monitor metrics to measure progress against identified targets

AWS Criteria Met

4.1 (4.1.1, 4.1.2)

4.2 (4.2.1, 4.2.2)

4.3 (4.3.1, 4.3.2, 4.3.3)

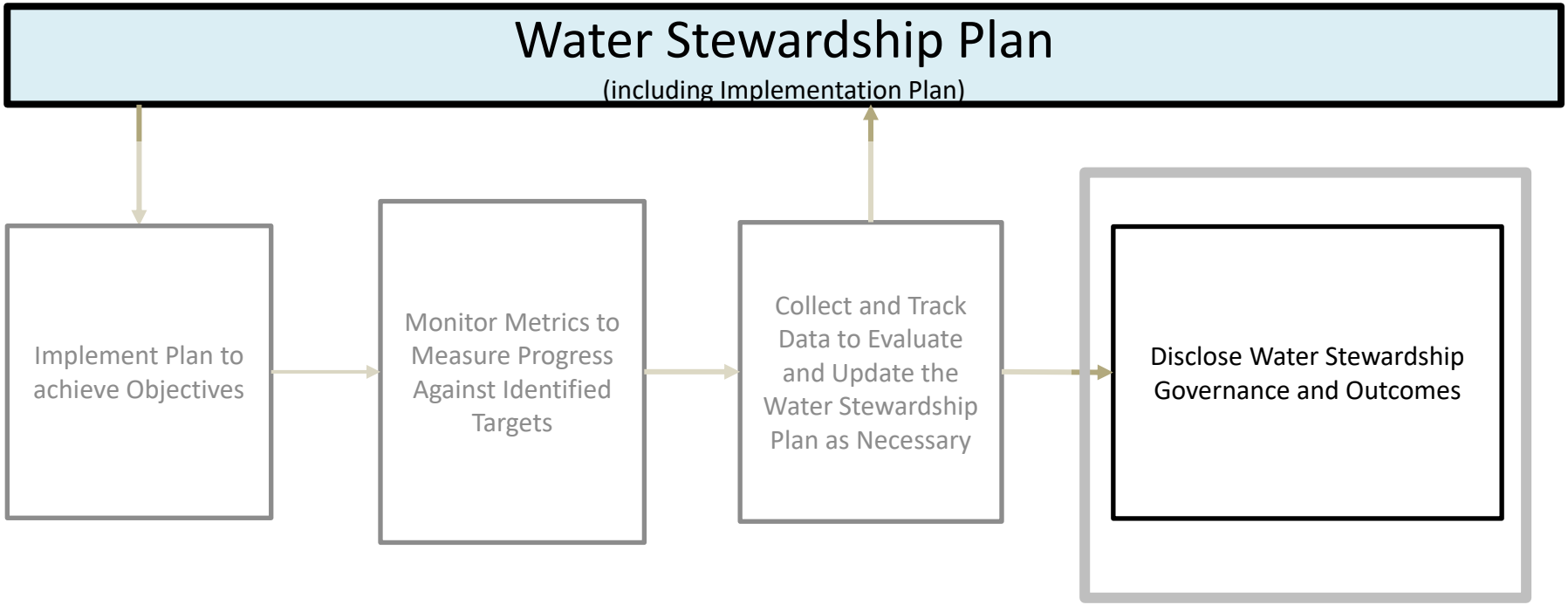
Collect and track data to evaluate and update the water stewardship plan as necessary

AWS Criteria Met

4.4 (4.4.1, 4.3.2)

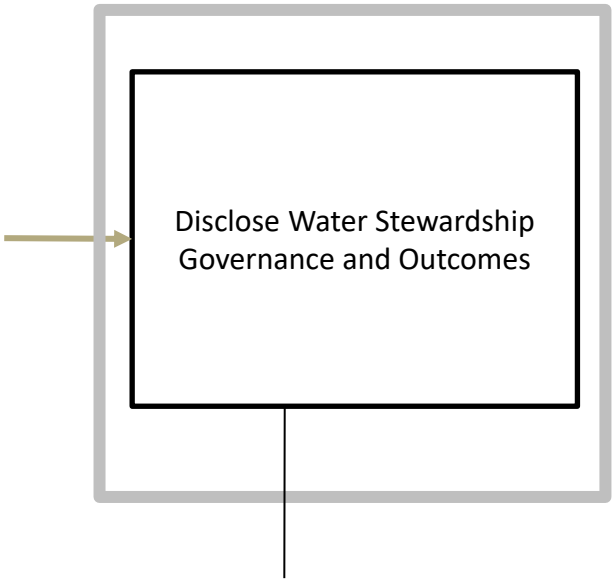
This fully covers the criteria in Step 4 of the AWS Standard.

Communicate and Disclose



- Report progress and metrics internally on a regular basis
- Communicate water stewardship progress to stakeholders and potentially more broadly
- Management decisions should include consideration of the success, or lack-thereof, against targets, if updates or additional water stewardship actions are needed these should be included in planning and result in updates to the Water Stewardship Plan

Communicate and Disclose



Disclose water stewardship governance and outcomes

AWS Criteria Met

5.1 (5.1.1)

5.2 (5.2.1)

5.3 (5.3.1)

5.4 (5.4.1, 5.4.2)

5.5 (5.5.1, 5.5.2, 5.5.3)

This fully covers the criteria in Step 5 of the AWS Standard.

A closer look at the criteria in the AWS Standard

- Each criteria identified previously by a number has a description and indicators in the AWS Standard
- With the understanding of the process of water stewardship, reviewing the criteria will help you understand what will be involved
- The following pages provide a closer look at the criteria
  - On the left of each page there are high-level self-assessment questions, matched to each criteria (listed on the right of the page) for each of the five steps of water stewardship
- Read the list of questions to gauge how well your operation is already doing water stewardship

Use the following list of questions to guage how well your operation is already doing water stewardship and what additional work will be needed to align with the criteria of the AWS Standard.

Step 1 - Gather and Understand	
Questions	**AWS Criterion**
	1.1
Do you have a detailed map of the site which includes water bodies, and water storage, treatment, pumping and wastewater systems?	Gather information to define the site's physical scope for water stewardship purposes, including: its operational boundaries; the water sources from which the site draws; the locations to which the site returns its discharges; and the catchment(s) that the site affect(s) and upon which it is reliant.
Do you have a map of the site within the bigger watershed with the original source of water for the site identified?	
	1.2
Do you have a list of communities, companies, and local water stewardship organizations?	Understand relevant stakeholders, their water-related challenges, and the site's ability to influence beyond its boundaries.
	1.3
Do you have one or more years of data for how much water is used on site, how much is discharged, how much storage and losses/leeks/evaporation happens?	Gather water-related data for the site, including: water balance; water quality, Important Water-Related Areas, water governance, WASH; water-related costs, revenues, and shared value creation.
Do you have emergency response plans for the site operations that relate to water and possible contamination of water?	
	1.4
Do you have a list of the primary inputs for your operation and where they are from, do you know roughly how much water is used in producing them?	Gather data on the site's indirect water use, including: its primary inputs; the water use embedded in the production of those primary inputs, the status of the waters at the origin of the inputs (where they can be identified); and water used in out-sourced water-related services.
	1.5
Do you have a state of the watershed document relevant for your catchment?	Gather water-related data for the catchment, including: water governance, water balance, water quality, Important Water-Related Areas, infrastructure, and WASH.
	1.6

	1.6
Have you met with stakeholders and noted their overall concerns about water?	Understand current and future shared water challenges in the catchment, by linking the water challenges identified by stakeholders with the site's water challenges.
	1.7
Have you assessed the risks and opportunities for the site related to water?	Understand the site's water risks and opportunities: Assess and prioritize the water risks and opportunities affecting the site based upon the status of the site, existing risk management plans and/or the issues and future risk trends
Have the risks been ranked and prioritized?	
	1.8
Do you have a detailed understanding of best practices related to water use for your industry sector?	Understand best practice towards achieving AWS outcomes: Determining sectoral best practices having a local/catchment, regional, or national relevance.
Do you have information around the best practices and standard for water use for the catchment you operate in?	

Step 2 - Commit and Plan	
Questions	**AWS Criterion**
	2.1
Do you have your corporate commitment to water stewardship documented in a signed statement?	Commit to water stewardship by having the senior-most manager in charge of water at the site, or if necessary, a suitable individual within the organization head office, sign and publicly disclose a commitment to water stewardship,
	2.2
Do you have a documented process for maintaining legal and regulatory compliance, with designated staff positions responsible for this?	Develop and document a process to achieve and maintain legal and regulatory compliance.
	2.3
Do you have a water stewardship strategy articulated?	Create a water stewardship strategy and plan including addressing risks (to and from the site), shared catchment water challenges, and opportunities.
Do you have a water stewardship plan with detailed actions to mitigate the risks and water challenges in the catchment, and build on opportunities identified?	
	2.4
Do you have a water stewardship plan that includes actions to respond to water risks related to the overall catchment (this might relate to major infrastructure)?	Demonstrate the site's responsiveness and resilience to respond to water risks.

Step 3 - Implement	
Questions	**AWS Criterion**
	3.1
Have you implemented actions described within your Water Stewardship Plan, which mitigate the risks and water challenges in the catchment?	Implement plan to participate positively in catchment governance.
Are you actively engaged with stakeholders in the catchment, such as attending catchment meetings or coordinating with relevant Government agencies?	
	3.2
Do you follow your plan for maintaining legal and regulatory compliance, as described in Criterion 2.2?	Implement system to comply with water-related legal and regulatory requirements and respect water rights.
Do you keep updated documents of this process?	
	3.3
Have you implemented actions to reduce site water use?	Implement plan to achieve site water balance targets.
Have you implemented actions to reduce site water loss/evaporation?	
Have you implemented actions to increase water reuse where possible?	
Have you established a method of monitoring and do you track the water coming and going from the site?	
	3.4
Have you identified important water quality metrics for your site?	Implement plan to achieve site water quality targets.
Based on the metrics identified, have you implemented actions to increase water quality on your site?	
Have you established a method to test site water quality?	
	3.5
Have you implemented actions to conserve or improve the health of wetlands, lakes, rivers or streams on your site?	Implement plan to maintain or improve the site's and/or catchment's Important Water-Related Areas.
Have you engaged with stakeholders in the catchment to maintain or improve the health of wetlands, lakes, rivers or streams in the local catchment?	
	3.6
Do you comply with Alberta's *Occupational Health and Safety Act* ?	Implement plan to provide access to safe drinking water, effective sanitation, and protective hygiene (WASH) for all workers at all premises under the site's control.

	3.7
Have you identified a way to reduce embedded water use on site?	Implement plan to maintain or improve indirect water use within the catchment.
Have you established a method to track embedded water in production?	
Within your Water Stewardship Plan, have you implemented your actions to maintain or improve water use inbedded in production?	
	3.8
Do you engage with your neighbours to discuss any water-related concerns you have?	Implement plan to engage with and notify the owners of any shared water-related infrastructure of any concerns the site may have.
Do you document your discussions and concerns?	
	3.9
Do you follow best practices related to water use in your industry?	Implement actions to achieve best practice towards AWS outcomes: continually improve towards achieving sectoral best practice having a local/catchment, regional, or national relevance.
Do you follow best practices related to water use in the catchment?	
Do you document the water-related best practices that you implement?	

Step 4 - Evaluate	
Questions	**AWS Criterion**
	4.1
Have you identified metrics/targets related to water use on site?	Evaluate the site's performance in light of its actions and targets from its water stewardship plan and demonstrate its contribution to achieving water stewardship outcomes.
Have you identified metrics/targets related to water quality on site?	
Are your implemented actions reaching these metrics/targets?	
	4.2
Do you prepare an annual report of emergency incidents and the responses for your site?	Evaluate the impacts of water-related emergency incidents (including extreme events), if any occurred, and determine the effectiveness of corrective and preventative measures.
For water-related emergencies, have you evaluated the effectiveness and proposed improvements to response approaches and preventative measures?	
	4.3

Have you prepared a method or plan for stakeholders to provide feedback related to your water stewardship?	Evaluate stakeholders' consultation feedback regarding the site's water stewardship performance, including the effectiveness of the site's engagement process.
Have you identified relevant targets for stakeholder feedback?	
Have these targets been met?	
	4.4
Do you use your metrics, targets, and feedback to evaluate the performance of your Water Stewardship Plan?	Evaluate and update the site's water stewardship plan, incorporating the information obtained from the evaluation process in the context of continual improvement.
From this evaluation, do you update your Water Stewardship Plan and related actions to improve performance?	

Step 5 - Communicate and Disclose	
Questions	**AWS Criterion**
	5.1
Is information regarding site management and related staff positions on your website?	Disclose water-related internal governance of the site's management, including the positions of those accountable for legal compliance with water-related local laws and regulations.
	5.2
Do you disclose your Water Stewardship Plan to relevant stakeholders of your site?	Communicate the water stewardship plan with relevant stakeholders.
	5.3
Do you create a summary of your site's water stewardship actions and results against identified targets?	Disclose annual site water stewardship summary, including the relevant information about the site's annual water stewardship performance and results against the site's targets.
Do you publicly disclose this summary?	
Do you prepare and disclose this summary each year?	
Do you ask for stakeholder feedback on this summary?	
	5.4
Does your water stewardship summary include all documented efforts to engage with stakeholders?	Disclose efforts to collectively address shared water challenges, including: associated efforts to address the challenges; engagement with stakeholders; and co-ordination with public-sector agencies.
	5.5
Do you document your site water-related compliance violations?	Communicate transparency in water-related compliance: make any site water-related compliance violations available upon request as well as any corrective actions the site has taken to prevent future occurrences.
Do you document related corrective and preventative actions?	
Do you make these documents available?	

Appendix G: Water Stewardship One-Page Summary Template

Template Water Stewardship One-page Summary

Commitment statement: [Why am I committing to being a water steward?] ***(e.g., alignment with the existing mission and vision)***				
Objective 'buckets'	**Watershed Context and External Engagement**	**Impact Mitigation (beyond the fenceline)**	**Operational Resilience (within the fenceline)**	**Internal Collaboration (and continuity)**
Objectives	[Fill this box with a statement which recognizes the importance of local watershed context (including water supply and water quality) to your operation. Comment on a commitment to engage with external stakeholders.]	[Fill this box with a statement acknowledging that operating in the watershed results in impacts on it. Comment on a commitment to mitigate negative water impacts beyond your operational fenceline.]	[Fill this box with a statement on making your operation the best and most resilient it can be. Comment on improving efficiencies and managing risks to your operation through water stewardship actions. This section can tie directly to 'Impact Mitigation']	[Fill this box with a commitment to operationalizing your water strategy within your organization on an ongoing basis and across all locations in which you operate to produce long-lasting water stewardship practices and benefits]
Programs (sub-objectives)	[Articulate how you will achieve the targets associated with objective(s) stated above through specific actions. The targets inform the program actions, which in turn link to which metrics to measure]	[Articulate how you will achieve the targets associated with objective(s) stated above through specific actions. The targets inform the program actions, which in turn link to which metrics to measure]	[Articulate how you will achieve the targets associated with objective(s) stated above through specific actions. The targets inform the program actions, which in turn link to which metrics to measure]	[Articulate how you will achieve the targets associated with objective(s) stated above through specific actions. The targets inform the program actions, which in turn link to which metrics to measure]
Outcomes	[Fill this box with one or more desired outcomes; what will be the final results of implementing water stewardship for you/your organization? Statements can be framed as end-state goals for the water strategy with respect to the operation, the watershed, or both.]			

Appendix H: Water Stewardship Facilitation Guide

Guide for Facilitating Water Stewardship on Behalf of a Group of Producers: Supporting watershed understanding and stakeholder engagement

1.0 Document Purpose

Practicing good water stewardship, in the spirit of the Alliance for Water Stewardship Standard, requires understanding the context of the watershed a producer is operating in, and connecting to the stakeholders of the operation to understand their water needs, their concerns and to gather suggestions and partners for appropriate water stewardship actions. Good water stewardship also requires communicating the commitments and results of actions.

While water management is about responsible use and management of water within the boundary of the operator's property, water stewardship requires extending your understanding and actions beyond your operation boundaries. While small-scale agricultural producers are often very experienced water managers, they typically do not have time or capacity to document an understanding of the local watershed, or do the stakeholder engagement that is a key part of water stewardship. For producers that are interested or required (through their supply chain) to implement water stewardship work, a larger entity that will coordinate the engagement and conversations with stakeholders is needed. An example of an organization that would be well-positioned to support this process is an irrigation district or a crop sector group.

This document is designed to provide guidance to a larger agriculture entity in a localized area to support water stewardship with a group of producers.

2.0 Stakeholder Definition

A stakeholder is any organization, group or individual that has some interest or 'stake' in the implementing organization's activities, and that can affect or be affected by them. The four main categories of stakeholder are: (1) Those who impact on the organization; (2) Those on whom the organization has (or is perceived to have) an impact; (3) Those who have a common interest; (4) Neutral - those with no specific link, but with whom it is relevant to inform (Alliance for Water Stewardship, 2019).

The most relevant stakeholders for water stewardship activities are individuals, groups, and entities that share the same water sources. Many issues are interlinked, such as environmental health, community wellbeing, local economy, and the organization's reputation. This means that stakeholders will not be exclusively water users upstream or downstream from the implementer. For a larger agriculture entity such as an irrigation district or a crop sector group, agricultural producers are a key stakeholder group.

For a group of producers the stakeholders will likely be other producers, the entities that provide their

drinking water and farm water, any downstream water users like a municipality, the water stewardship group, and possibly local buyers of their product.

3.0 Understanding the watershed

Because water stewardship is about responsible water use and actions in the context of the watershed, understanding the watershed is key. A large agricultural entity can support a group of producers all operating in one watershed in understanding the context for water stewardship by hosting a local watershed expert or water stewardship group (such as the Oldman Watershed Council) to present the context of the watershed. If done in a coordinated manner for the purpose of water stewardship this presentation could support understanding as well as potential collective actions to mitigate key water issues in the local area. Stakeholders may benefit from being included in the presentation of the watershed, and it may support them to contribute more concrete ideas in the stakeholder engagement process.

The presenter should be invited to discuss the status of the watershed, the water quality and water quantity, wildlife and species of concern, major upstream water infrastructure, water governance and decision-making, and key pressures on the watershed.

4.0 Identifying Stakeholders

Stakeholders can be identified through an iterative process of thinking through which organizations and other producers are connected to the producer group in terms of water-related activities, and then which individual from each organization or farm can be contacted.

5.0 Engagement Format and Objectives

A variety of formats can be used to connect with and engage stakeholders including open-houses or workshops, focus groups, online discussions, and emailed questions. A larger format group discussion may be the best approach to support all producers that are pursuing water stewardship actions to be present, as well as the stakeholders. It is important that the producers doing water stewardship actions hear directly from each other and the stakeholders in the room, and that they be able to ask questions in response.

Likely the beginning of the group discussion will require providing some context for everyone on why the questions are being asked and what the overall purpose is.

The objectives of engagement should be to provide information, to answer questions, understand the local water-related concerns, and hear suggestions for actions that could mitigate those concerns.

Creating an initial list of questions is an important first step to ensure meaningful conversation and engagement. Questions may include:

1. What are your water-related concerns?
2. What are the water challenges you face?

3. What suggestions or ideas do you have for mitigation of these water risks and concerns?
4. What water stewardship actions would you like to see?
    a. Short-term actions over the next 6 months?
    b. Long-term actions over the next 2 years?
5. What are the important water-related areas in the catchment?

The Agriculture's Water Future (AWF) project asked these 5 questions using all four formats of stakeholder engagement. Four Working Group meetings were held throughout 2021 and 2022 to discuss risks, opportunities, actions, and progress of water stewardship planning. These Working Groups were held both online and in-person, and included 21 different organizations, representing a wide range of stakeholders in Southern Alberta. An in-person focus group was held in Lethbridge in early 2022 to bring a smaller group together and included 7 different stakeholder groups. This focus group highlighted several key water-related concerns in Southern Alberta, such as the reduction in government support and funding to support water quality and monitoring. This focus group was then able to brainstorm and prioritize potential actions to address water stewardship and sustainability.

6.0 Template for event supporting water stewardship for producers

In this example an irrigation district is supporting their membership in doing water stewardship.

Initiation

- A group of producers are all interested in doing water stewardship (potentially the supply chain is demanding it).
- The Irrigation District is committed to supporting the water stewardship by hosting a member meeting with additional invitees.

Planning

- The Irrigation District contacts the local watershed organization and invites them to present at the meeting.
- The Irrigation District identifies stakeholders and invites them to the meeting, providing an explanation of what the meeting will be for.

Event

- Possible agenda
    - Welcome and introductions – 15 minutes
    - Explanation of the goal of the meeting and producer interest in water stewardship - 10 minutes
    - Presentation of watershed by the local watershed organization – 30 minutes
    - Roundtable discussion of water-related concerns and challenges – 20 minutes
    - Roundtable discussion of overall solutions to challenges – 20 minutes
    - Roundtable discussion of farm-based opportunities and possible actions – 20 minutes
    - Summary of key take-aways and where to find more information

- Irrigation District organizes the venue, food, nametags, adequate sound system, etc for the event.
- All producers who are doing water stewardship put their top three actions (already done or near term) on sticky notes and put them on the wall at the event, to serve as ideas, conversation starters and to informally record commitment.

7.0 Documenting the Engagement

Documentation of stakeholder engagement is critical to understand the water challenges within the basin, and to build a water stewardship plan in the spirit of the Alliance for Water Stewardship Standard. Linking water related challenges identified by both stakeholders and the implementer highlights the shared water challenges in the catchment. Examples of shared water challenges identified during the AWF project include:

1. Impact of climate change on water availability.
2. Impact of climate change and the high water demands compounding stress on the ecosystems.
3. Reduced government support for water quality monitoring.
4. Oldman watershed is closed to new licenses.
5. Threat of invasive species.

8.0 Communicating

A key part of water stewardship is disclosing the results of water stewardship work, and communicating the progress as well as the setbacks to relevant stakeholders, partner organizations, and sometimes the public. Individual farm operations may not feel comfortable disclosing information with concerns it will be taken out of context, but amalgamated information for a group of producers doing water stewardship could be disclosed by the larger agricultural entity. The agricultural supply chain is requiring more documentation and disclosure, and communicating and disclosing information to the public with appropriate context, is important for building pubic trust.

A variety of tools can be used for communicating the water stewardship commitments and progress by producers to a wider audience. The tools chosen should be based on what type of communication is the focus and why, and factors such as who is the audience and how often is the communication going to be happening.

A suggested action for the larger agricultural entity is to create a communication plan that producers will be willing to provide their information to, compile the information to be disclosed from the group of producers, and then publicize and promote the disclosure through all available channels and partner organizations.

Appendix I: Risks and Opportunities Assessment Template

Identify Risks and Opportunities

Before starting to identify the risks and opportunities, it is valuable to know as much information as possible about the current operation and the overall catchment water needs and availability. The initial stages of water stewardship planning process require compiling the information. It is a good idea to have much of that information gathering work completed before starting on the risk and opportunities assessment.

The AWF project compiled the watershed context document, conducted site visits and pulled maps and data together, and then started the identification of risks and opportunities with a brainstorming process. The project team members, the Implementers, and the Working Group members collaborated to brainstorm the risks and opportunities. All suggestions were captured at this stage, there were no criteria such as cost or feasibility. The initial round of brainstorming used sticky notes and a white board for facilitating the discussion among all participants. Risks and opportunities were identified that were relevant to the Implementer, to the potato supply chain, and to the Oldman River watershed. Over a series of steps in the project process the risks and opportunities were categorized, grouped, and shortlisted.

Stakeholder engagement was also part of risk assessment because the stakeholders were asked to identify their water-related concerns. Stakeholders also offered ideas for actions to mitigate risks, which are considered opportunities.

Assess Risks

Rating the identified risks will provide the operator or decision-makers more information to decide which risks should be prioritized in terms of actions to mitigate them. The ranking of the risk may determine if a budget allocation for a mitigation action is urgently needed by the implementer.

Typically, a risk can be assessed based on likelihood and severity, using a risk matrix. The specific definitions of the categories and the different levels of risk can be defined by the Implementer themselves to ensure the resulting ranking is reflective of the way the operators and decision-makers think about risks.

A general risk matrix (below) was prepared by WaterSMART Solutions for the example exercise of evaluating risks based on the severity and likelihood. It includes the four categories and results in a risk ranking structure with four levels. The list of identified risks were assessed using this example risk matrix, resulting in a ranking from 1 to 4 for each risk. Then the risks can all be prioritized in order from top risk priority for action to least. The prioritization will be informed by the ranking score, but determined by the Implementer.

Table 1. Example risk matrix, this was developed by WaterSMART Solutions as a general example and is not specific to any of organizations involved in the AWF project process.

			Severity of risk			
			Low	Medium	High	Severe
			1	2	3	4
	Operational (people /assets)		minor	moderate	significant	critical failure
	Regulatory /legal		minor	moderate	significant	shut down
	Reputational (public concern)		a few people /minor concern	many people /moderate concern	many public and business influencing people	long term bad reputation
	Financial		<$50,000	>$50,000 to $500,000	>$500,000 to $1,000,000	>$1,000,000 (critical loss)
Likelihood of risk (frequency)	Remote	1				
	Occasional	2				
	Probably	3				
	Urgent/Frequent	4				
		Risk ranking	Level 1			
			Level 2			
			Level 3			
			Level 4			

Aligning Risks and Opportunities in a table and identifying possible actions

One of the primary objectives of identifying risk and opportunities, is to inform the actions that are chosen to be included in the water stewardship plan. The next step that the AWF project followed supported the identification of actions that take advantage of an opportunity or mitigate a risk (or both).

The project team found that most of the opportunities matched with a risk that was identified. For example, the risk might be 'a large rainstorm event causing flooding on site,' and the opportunity would be 'collect data about stormwater generation on site allowing an assessment of the volume that could be captured for landscape irrigation.' The project team created a table that aligned the risks and opportunities. In some cases, multiple opportunities aligned with one risk, or vice versa. The table of

risks and opportunities was developed and refined by clarifying wording, combining several points together, and deleting duplicates.

The table template below is oriented with the opportunities first and the associated risks in the next column over. This was chosen to highlight and focus on the opportunities offered by water stewardship actions. This also works well because there are some opportunities that do not have an associated risk. Re-arrange the table if it will be more logical for your decision-making process.

The table has a column for possible actions. This table is designed to stimulate creative ideas for possible actions that would address the risk or take advantage of an opportunity. In the AWF project many of the water stewardship actions included in the Implementers' Water Stewardship plans we selected from among the ideas in this table.

Identifier	**Opportunity** (category ***italicized***)	**Risk** (category ***italicized***)	**Possible Actions**	**Notes**
A	An opportunity lies in…	A risk to [operation] from… •	•	
B	There is an opportunity to…	A risk from…	•	•
C	An opportunity lies in…	A risk from …	•	•
D	There is an opportunity to…	A risk from …	•	•
E	There is an opportunity …	(Not applicable, no related risk)	•	•