

# CMR Stormwater Background Report

## 1. BACKGROUND REPORT OBJECTIVE

The objective of this report is to:

- a) identify common definitions and differentiate between municipal versus regional significance regarding stormwater management;
- b) summarize how stormwater servicing is regulated and administered within in each municipality;
- c) identify regional best practices within the CMR, other regions across Canada and the world;
- d) summarize provincial and municipal policy and regulations that affect stormwater management within the region; and,
- e) identify key themes for regional stormwater servicing for consideration of the growth planning consultant in growth and servicing plan development.

## 2. STORMWATER SERVICING/MANAGEMENT WITHIN THE CMR

### 2.1. DEFINITION OF STORMWATER

*"Stormwater is runoff from rainstorms, hailstorms or melting snow that is shed from urban and rural landscapes. Stormwater picks up pollutants, including trash and suspended and/or dissolved solids that impact the quality of downstream water bodies."*

Stormwater is regulated by Provincial Regulations (which define quantity and quality of runoff). The Province, in turn, grants the municipalities jurisdiction over the land use plans that control the nature of engineered structures and operational controls that achieve the broader objectives for quality and quantity

Stormwater may result in localized flooding and overland flow which is primarily limited to the scale of individual sites and neighbourhoods and are therefore managed at the municipal rather than regional scale. Stormwater may also result in riverine flooding that often occurs at a regional scale.

Because regional-scale flooding brings forward questions related to land use, mitigation measures, infrastructure investments, technical standards for infrastructure design, and political leadership, it is critical to have a truly integrated approach. Further details on the integrated approach to riverine flooding is the topic of a separate CMRB work package.

Regional stormwater servicing within the CMR refers to the collection, conveyance, storage and discharge of stormwater that crosses intermunicipal boundaries through

engineered infrastructure or natural drainage (watersheds or wetlands). Stormwater drainage systems are generally at a site or neighbourhood scale. Reservoirs, lakes, rivers, wetland complexes and tributaries in the CMR are not considered to be stormwater infrastructure, but they are the critical natural components of the overall regional stormwater drainage system.

CMR stormwater management challenges arise from a variety of factors including:

- source water quality concerns related to upstream land uses;
- relatively flat landscape that increases susceptibility to overland flooding during extreme events;
- limited availability to receiving waters within the northeast portion of CMR;
- air quality concerns (including H<sub>2</sub>S odours) associated with organic matter in ponds that sit idle under ice for extended period; and
- co-mingling of hail and snow that often affect the sizing and performance of storage and control structures even during spring/summer events.

The only regional engineered infrastructure within the CMR that receives stormwater is the Western Irrigation District (WID) system, however its primary function is the delivery of irrigation water to more than 400 farms and municipal water to approximately 12,000 people within the WID service area. As such, the WID's acceptance of stormwater has negative impacts on the quality of water supplied for irrigation.

## 2.2. MUNICIPAL CONTEXT – STORMWATER

The following table summarizes the stormwater servicing context of each municipality, as adapted from the CMRB Municipal Context Reports and CMRB member municipality web sites.

<b>Municipality</b>	<b>Municipal Stormwater Service Context</b>
<b>Airdrie</b>	<p>The stormwater management system in Airdrie is made up of a network of underground storm mains and above ground Storm Water Management Facilities including engineered swales and stormwater ponds. Stormwater is collected and released from the system in a controlled matter in order to protect infrastructure and ultimately Nose Creek. The City adopted its Master Stormwater Drainage Plan in September 2013.</p> <p>Refer to Drainage BYLAW NO. B-03/2014 – manage stormwater within the city.</p> <p>Airdrie is part of the Nose Creek Collaborative Partnership with Rocky View County, Calgary Airport Authority and the City of Calgary. The objective of the Nose Creek Collaborative Partnership is to protect the riparian areas through management of volume control, release rates and and improve water quality in the Nose Creek through stormwater management.</p>
<b>Calgary</b>	<p>The City's stormwater system is comprised of minor and major systems consisting of 4,700 km of buried pipe. The minor systems consist of primarily underground infrastructure intended to handle minor storm events. The major systems consist of surface and underground</p>

<b>Municipality</b>	<b>Municipal Stormwater Service Context</b>
	<p>infrastructure intended to handle major storm events. In most communities in Calgary and other cities, the minor system is designed to drain one-in-five-year storms. In some older communities built prior to 1952, the minor systems are designed to handle one-in-two-year storms. The major systems are designed to handle 1:100 year storm events. Calgary's storm-drainage system has approximately 350 wet and dry ponds. These ponds are intended to attenuate storm flows to achieve the design service levels and provide a level of treatment to reduce Total Suspended Solids (TSS) loadings discharged to waterways. The City adopted its Stormwater Management Strategy in 2005 – the strategy is currently being updated.</p> <p>Since January 2004 the storm drainage system became financially self-supporting through what is now called the monthly Drainage Service Charge on customers' utility bills, in addition to fees paid by the development industry to support servicing of new developments. Like the water and wastewater utilities, the storm drainage system does not receive money from property taxes.</p> <p>Reusing stormwater for municipal purposes is a priority. The interpretation of the <i>Water Act</i> by the Government of Alberta has made natural wetland retention and meeting Calgary's stormwater management objectives challenging, however, progress is being made to resolve these issues. The City's Total Loading Management Plan and Stormwater Management Strategy aim to reduce pollutants from entering the Bow River. Furthermore, Calgary is part of several inter-municipal groups and watershed stewardship groups to manage stormwater.</p> <p>The City of Calgary participates in the following Stormwater and Watershed Management Groups:</p> <ul style="list-style-type: none"> <li>• Bearspaw Reservoir Trilateral Task Force</li> <li>• Nose Creek Watershed Partnership</li> <li>• Elbow River Watershed Partnership</li> <li>• Bow River Basin Council</li> <li>• Cooperative Stormwater Management Initiative (CSMI)<sup>1</sup></li> </ul> <p>The City of Calgary Source Water Protection Plan has identified 12 priority actions to proactively protect Calgary's regional water supply which are based on the following four goals:</p> <ul style="list-style-type: none"> <li>• Protect the source watershed with improved land use planning</li> <li>• Promote innovation in stormwater management to protect source water quality</li> <li>• Leverage key partnerships for risk mitigation</li> <li>• Involve the community through education and outreach</li> </ul>
<b>Chestermere</b>	Stormwater management in Chestermere is comprised of minor and major infrastructure systems which convey stormwater from urban development to stormwater ponds and ultimately outfall to Western Irrigation District infrastructure. Stormwater management facilities in the City of

<sup>1</sup> Rocky View, Strathmore, Chestermere, Wheatland, Calgary and the Western Irrigation District have participated in the Cooperative Stormwater Management Initiative (CSMI) since 2012.

<b>Municipality</b>	<b>Municipal Stormwater Service Context</b>
	<p>Chestermere are designed and constructed in accordance with the City of Calgary Design Standards and Alberta Environment Regulations.</p> <p>The City of Chestermere is currently working with regional partners to secure an approved stormwater outfall for future urban development.</p> <p>In 2019 the City re-gained the management of all stormwater facilities from Chestermere Utilities Inc. which owned and managed the utility from 2015-2019.</p> <p>Chestermere adopted its Integrated Stormwater Master Plan in 2015 and an update is currently underway. The update will also include a flood mitigation study on existing infrastructure.</p>
<b>Cochrane</b>	<p>In Cochrane, developers are required to provide the necessary stormwater infrastructure to service growth areas in accordance with Cochrane and Alberta Environment standards. The Town of Cochrane requires that Storm Water Management reports comply with the requirements set out in the City of Calgary Stormwater Management and Design Manual in accordance with the Surface Drainage Bylaw 13-2005. Intensification via redevelopment of some of the inner areas of Town could face challenges with an already over capacity existing stormwater system servicing the downtown area. Site specific redevelopment areas will need to be assessed and solutions to the capacity issues addressed. Cochrane will be updating the existing Integrated Stormwater Master Plan and associated rate structure in 2020 to ensure proper system operations and asset performance to address quality and capacity performance.</p>
<b>Foothills</b>	<p>Stormwater is addressed within the Municipal Development Plan adopted in 2010.</p> <p>Within the County, regardless of the scale of development, drainage plans are required in order to mitigate stormwater impact and must include the preservation of critical water features such as wetlands and riparian areas. The County supports integrated watershed management plans which address water quality, such as the Bow Basin Watershed Management Plan.</p>
<b>High River</b>	<p>High River adopted its Infrastructure Master Plan (IMP) in 2011. The underground portions of the IMP were superseded in 2017 by the Utility Master Plan (UMP) which includes the stormwater system.</p> <p>Due to the age of infrastructure within portions of the Town, there are stormwater management issues in certain areas of the Town. A sub-regional plan would be helpful, however no intermunicipal stormwater plan exists currently.</p>
<b>Okotoks</b>	<p>The storm sewer and drainage systems consist of 117 kms of main lines, 2,000 catch basins and 1,460 manholes with 15 main outfalls to the Sheep River. The Town's Stormwater Management Master Plan was completed in 2014.</p> <p>The Okotoks system has been designed and constructed according to the City of Calgary specifications recognizing their leadership in this area. The system includes stormwater management facilities and a combination of natural and human made collection systems all terminating in the Sheep River. The system has proven itself through several significant events in the past 20 years and been upgraded accordingly including flood protection along the Sheep River with the support of senior levels of government.</p>

<b>Municipality</b>	<b>Municipal Stormwater Service Context</b>
	Okotoks would like to see the use of stormwater and effluent become possible through provincial policy as one of many solutions to the water constraints in the South Saskatchewan Basin.
<b>Rocky View</b>	<p>The County utilizes Master Drainage Plans within new developments to identify Best Management Practices, conveyance routes and alternative outfall strategies. In many of these Plans, stormwater use has been identified as an important element in managing stormwater.</p> <p>Stormwater management is a challenge in the northeast quadrant of the County where there is insufficient capacity for stormwater discharge. The County’s current solutions include setting aside developable land for evaporation ponds or increased operational costs for site drainage.</p> <p>Rocky View County participates in the following initiatives:</p> <ul style="list-style-type: none"> <li>• Elbow River Watershed Partnership</li> <li>• Bow River Basin Council</li> <li>• CSMI</li> <li>• Nose Creek Watershed Partnership</li> <li>• Bearspaw Reservoir Trilateral Task Force</li> </ul>
<b>Strathmore</b>	<p>Stormwater management is governed by the Town’s Stormwater Management Policy adopted in 1993.</p> <p>Limitations within Strathmore stormwater systems are limiting growth within the Town. Due to the Town’s significant wetlands, relatively flat grade and the requirement for additional stormwater control infrastructure, the area that can be practically considered for development is less than the gross area.</p> <p>The Town has a stormwater master agreement in place with Western Irrigation District (WID) for pre-annexation areas. Currently stormwater drains into Eagle Lake.</p>
<b>Wheatland (CMRB Portion)</b>	The County identifies stormwater system design and construction standards within its 2016 Standards Manual. Within CMR geographical area of Wheatland County, the West Highway 1 Area Structure Plan addresses stormwater management. The Hamlet of Cheadle has significant stormwater drainage issues which are limiting development in the hamlet. The west industrial subdivision also has stormwater drainage issues. Wheatland is a partner in the CSMI initiative.

### **3. EXAMPLES OF REGIONAL BEST PRACTICES IN STORMWATER**

National Research Council (NRC) provides a Best Practice Guide for stormwater management planning with recognition that watersheds (as natural drainage systems) are the appropriate level at which effective stormwater planning begins. NRC identifies a hierarchy of stakeholders and features of stormwater plans cascading downstream from site, neighbourhood, sub-watershed and watershed drainage levels.

Across Canada, regional planning authorities generally establish high-level principles and facilitate collaboration between neighbouring municipalities.

Examples of CMR initiatives include:

- Bearspaw Reservoir Trilateral Task Force was launched in 2018 by City of Calgary, Rocky View County and Transalta to identify risks, issues and management options for the Bearspaw Reservoir that provides drinking water to 1.4 million customers within the region;
- Bow River Phosphorous Management Plan was launched in 2011 as a collaborative initiative to address water quality policy objectives established for the middle reach of the Bow River between Bearspaw and Bassano Dams that affect the capacity of the Bow River to assimilate wastewater discharges from the 3 largest wastewater treatment plants in the region at Bonnybrook, Fish Creek and Pine Creek;
- Cooperative Stormwater Management Initiative (CSMI) was initiated in 2012 as a joint initiative between Western Irrigation District, Rocky View, Chestermere, Wheatland, Strathmore and Calgary (with AEP support) to establish stormwater infrastructure to provide cost effective and ecologically sound outlets for stormwater within the area;
- Nose Creek Watershed Water Management Plan (Airdrie, Rocky View, Calgary, Calgary Airport Authority, Town of Crossfield) recognizes that watershed management is a shared responsibility and identifies goals and objectives that maintain the ecological integrity (function) of the watershed and minimize risks associated with land use and development.

Across Canada, other notable regional initiatives include:

- Edmonton Metropolitan Region Board acknowledges that coordinated stormwater drainage planning should be considered for lakes, rivers and creeks where watershed boundaries cover multiple municipalities
- Metro Vancouver provides regional policy guidance through forums including the Stormwater Interagency Liaison Group
- Greater Golden Horseshoe (Ontario) outlines regional growth plan requirements that are informed by watershed plans.

Around the world, stormwater and municipal wastewater are reused to address water shortages including:

- New York City worked with State regulators and the Watershed Agricultural Society to implement the Catskill Farm program in which the City avoided water treatment plant upgrade costs by subsidizing capital and operational costs for pollution control measures on farm lands upstream of the City's treatment works;
- Sydney Park (Australia) treats 860 million litres of stormwater for downstream reuse to meet 10% of the City's water demand;
- Orange County (California) recycles treated wastewater for landscape irrigation, power generation cooling and other industrial uses; and,

- Singapore recycles treated sewage for industrial uses or blending with drinking water supply during drought periods.

As the CMRB member municipalities continue to address potential water shortages due to weather cycles and climate change, stormwater use becomes increasingly attractive. Key challenges around stormwater in the CMRB include: AEP reuse regulation and policy, extreme variability in flows associated with intense rainfall events, interference of snow/hail with engineering systems for collection and conveyance, high salinity associated with early-spring runoff from street surfaces, nutrient loading, economics of stormwater use vs raw water treatment/distribution and the potential of cross-contamination with sewer overflows.

#### **4. REGIONAL STORMWATER CONTEXT IN THE CMR**

CMRB drainage enters 14 hydrologic units (sub-watersheds) that cross intermunicipal boundaries and can therefore be classified as regional in scope. These units are illustrated in Figure 1:

- Bow River- Ghost Reservoir<sup>2</sup>
- Bow River – Bighill Creek<sup>2</sup>
- Elbow River<sup>2</sup>
- Fish Creek
- Highwood River
- Horse Creek
- Jumpingpound Creek<sup>2</sup>
- Middle Bow River<sup>2</sup>
- Nose Creek<sup>2</sup>
- Pine Creek
- Rosebud River<sup>2</sup>
- Serviceberry Creek
- Sheep River
- Upper Little Bow River

In addition, portions of CMRB municipalities drain into the Kneehill Creek, Little Red Deer River, Mosquito Creek, West Arrowhead Creek hydrologic units that discharge into the Red Deer and Oldman River Basins.

Stormwater systems that drain into sub-watershed units within the CMRB are typically administered within individual municipalities under a hierarchy of plans that culminate at the Subdivision Servicing Agreement-level (site-scale) and often originate in progressively larger plans including Neighbourhood Structure Plans, Community Area Structure Plans, Master Drainage Plans and eventually Municipal

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<sup>2</sup> Denotes watershed represented by watershed stewardship group (WSG) or watershed planning and advisory council (WPAC) actions

Development Plans. Within the CMR, the scope, complexity and terminology within these plans can vary considerably.

Provincial regulations governing stormwater flows are found within both the *Water Act* and Environmental Protection and Enhancement Act (EPEA). Surface water quality Triggers and Limits are defined within the South Saskatchewan Region Surface Water Quality Management Framework (2014). The overarching statutory plan regulating water management within the CMRB is the Approved Water Management Plan for the South Saskatchewan River Basin.

More specifically, stormwater management is regulated under the *Water Act* when systems alter the flow or direction of flow to natural water bodies. Similarly, approval is required under Alberta Environmental Protection and Enhancement Act (EPEA) to ensure the works meet provincial standards for timing and quality of stormwater runoff released to the environment.

Stormwater drainage systems must meet the requirements established in the Wastewater and Storm Drainage Regulation (119/1993) and in conformance to Alberta Environment and Parks (AEP) Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems (2013). Detailed stormwater management standards are described in Stormwater Management Guidelines for the Province of Alberta (1999) that includes guidance for the planning, analysis, design, construction, operation and maintenance of stormwater management systems. Water quality objectives are further defined in AEP's Environmental Quality Guidelines for Alberta Surface Waters (2018) to protect aquatic life, agricultural and recreational uses.

Under Alberta's Water for Life Strategy, Watershed Planning and Advisory Councils (WPAC's), particularly the Bow River Basin Council, play a key role in the development of objectives and strategies for achieving water quality objectives within the Basin. At a smaller scale, Watershed Stewardship Groups (WSG's), such as the Elbow River Watershed Partnership and Nose Creek Watershed Partnership, play a key role in establishing sub-watershed targets and work together with multiple stakeholders at the local level to improve practices related to land use and stormwater management.

The Western Irrigation District (WID) and Bow River Irrigation District (BRID) operate irrigation and stormwater conveyance systems in the northeastern and southeastern portions of the region (Figures 2 and 3). In particular, the WID has been a key participant for the Cooperative Stormwater Management Initiative as providing a potential outfall for stormwater from the northeastern portion of the CMR.



## **5. REGIONAL STORMWATER SERVICE IN THE CMR – EMERGING KEY THEMES AND OPPORTUNITIES**

At CMR scale, stormwater servicing is about collaborative regional stormwater management because stormwater drainage becomes another community's source water.

Key priorities within the CMR include:

1. Drinking water quality for public health and safety
2. Affordability of water treatment
3. Water quality for ecosystems and downstream users
4. Management of nutrient loading
5. Protection of people, land, property and ecosystems
6. Stormwater use
7. Increase public utilization of stormwater infrastructure

These priorities, desired outcomes and regional opportunities are summarized in Table 1.

Key themes for the CMRB include:

1. **Watershed Planning:** Supporting key regional initiatives including the work of WPAC's, WSG's, provincial initiatives and others;
2. **Collaboration:** Ensuring consistent and mutually-beneficial stormwater management plans for intermunicipal watersheds;
3. **Advocacy:** Working with the Government of Alberta and others on strategic initiatives that provide regional benefits.

### **Watershed Planning**

Watershed planning in Alberta brings together diverse stakeholders to establish watershed-specific targets for water quality and quantity. The CMRB may wish to encourage its member municipalities to actively participate in these initiatives and ensure that appropriate watershed targets are adopted in each intermunicipal sub-watershed and recognized in statutory land use plans, where appropriate.

Consideration should be given to WSG-level collaboration within intermunicipal sub-watersheds that are not currently supported by an active stakeholder group. Water quality objectives should be established that are scientifically-based and ratified by affected municipalities in a manner that reflects their specific priorities and concerns. Whereas 6 of 14 sub-watersheds within the region are under active consideration by watershed planning or stewardship groups, CMR municipalities may support the development of stewardship activities within the remaining 8 sub-watersheds, where necessary.

## **Collaboration**

Collaboration between CMRB member municipalities within each of the sub-watersheds can improve the operating efficiencies and economics of stormwater management infrastructure. Alignment of neighbouring municipal development plans can ensure that the cumulative effects of stormwater on quality and quantity of water are managed.

A leading example of the integration of upstream stormwater works and drainage management within a natural sub-watershed is the Nose Creek Watershed Water Management Plan. The Plan provides recommendations for setbacks and stormwater management principles that are being adopted within Airdrie, Calgary, Rocky View, Crossfield and the Calgary Airport Authority.

Likewise, the establishment of the Cooperative Stormwater Management Initiative (CSMI) is an example of collaboration between both municipal and irrigation entities to mitigate the effects of stormwater runoff on irrigation water quality while reducing the restrictions that stormwater discharge imposes on land development.

Finally, the emergence of the Bearspaw Reservoir Trilateral Task Force is a further example of sub-regional collaboration regarding the potential impact on drinking water supplies. The Task Force released a Consensus Report in June 2019 that includes recommendations for management options that could apply to the estimated 89,000 residents within the Task Force's planning area.

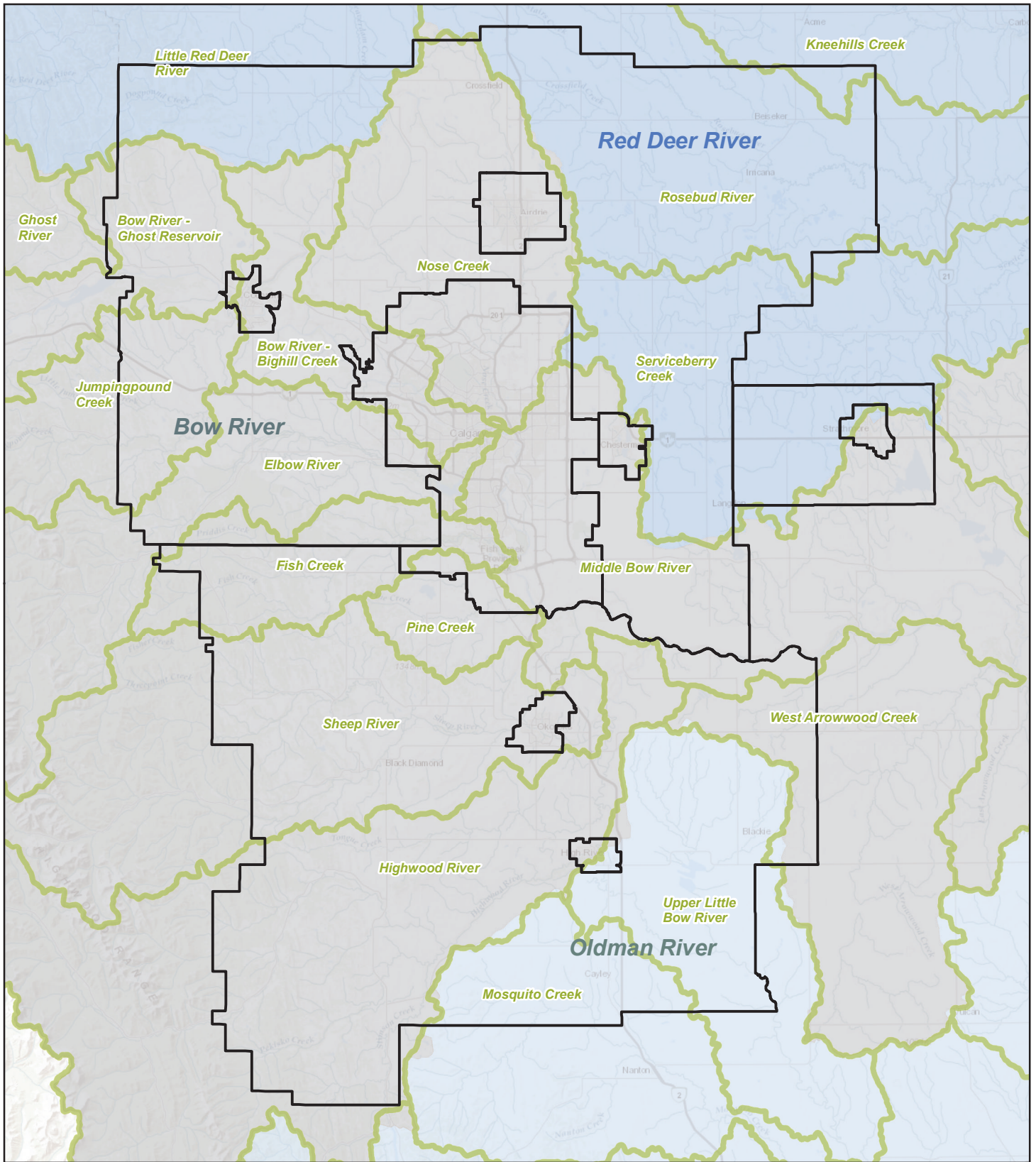
During the development of the Growth and Servicing Plan for the CMR, key areas requiring more focused collaborative planning can be identified.

## **Advocacy**

The CMRB can advocate to the province for a favourable regulatory and policy regime that creates new opportunities for stormwater use as a mechanism to offset potential water shortages. This includes addressing factors that may restrict municipalities including the timeliness of Provincial approvals and overcoming regulatory barriers to the innovative approaches that have been successfully applied within other water-short jurisdictions around the world.

CMRB's members are actively considering stormwater use projects in their municipalities and would benefit from the timely promulgation and execution of Stormwater Guidelines proposed by Alberta Environment and Alberta Public Health. Possible advocacy strategies for the CMRB may include (i) the development of a CMRB-specific Code of Practise for Municipal Stormwater Use that simplify approvals and (ii) supporting additional staffing within the AEP and Alberta Health during the initial roll-out of the Alberta Water Reuse and Stormwater Use Guidebook, anticipated in the near-term.

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Major Sub-watersheds

- Bow River
- Oldman River
- Red Deer River

Hydrologic Unit Code 8

*The Hydrologic Unit Code (HUC) Watersheds of Alberta represents a collection of four nested hierarchically structured drainage basin feature classes that have been created using the Hydrologic Unit Code system of classification developed by the United States Geological Survey (USGS) with accommodation to reflect the pre existing Canadian classification system. The HUC Watersheds of Alberta consist of successively smaller hydrologic units that nest within larger hydrologic units, resulting in a hierarchal grouping of alphanumerically-coded watersheds feature classes. More information on the USGS hydrologic units can be found at <http://water.usgs.gov/GIS/huc.html>*



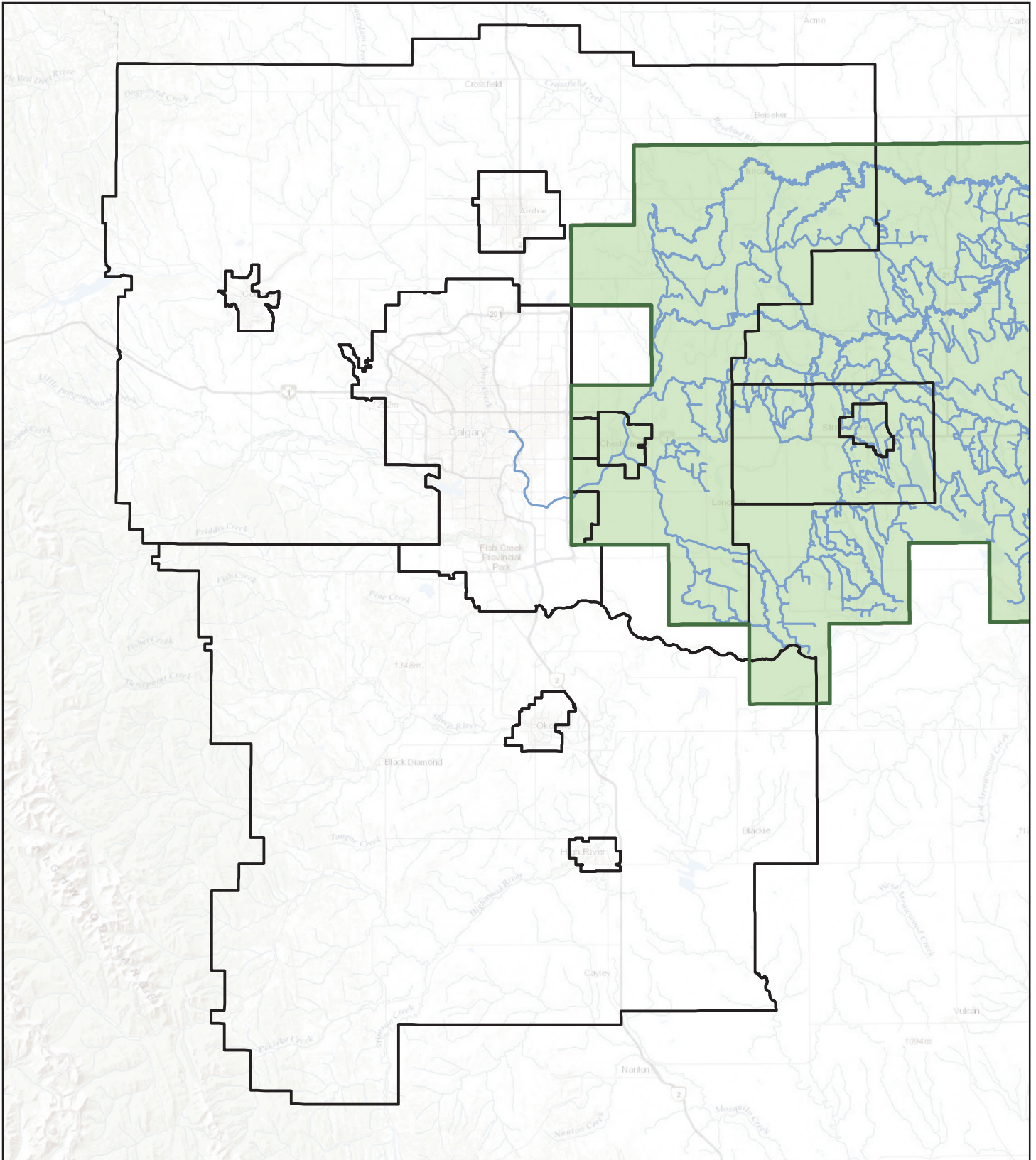
**Fig 1: Hydrologic Units (Sub-Watersheds) within the CMRB**



Data Sources: Government of Alberta, Ministry of Environment and Sustainable Resource Development  
Map Created: 2019-12-13

Map are for reference purposes only. The CMRB provides no warranty, nor accepts any liability arising from any incorrect, incomplete, or misleading information.

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Western Irrigation District

Western Irrigation District Canal



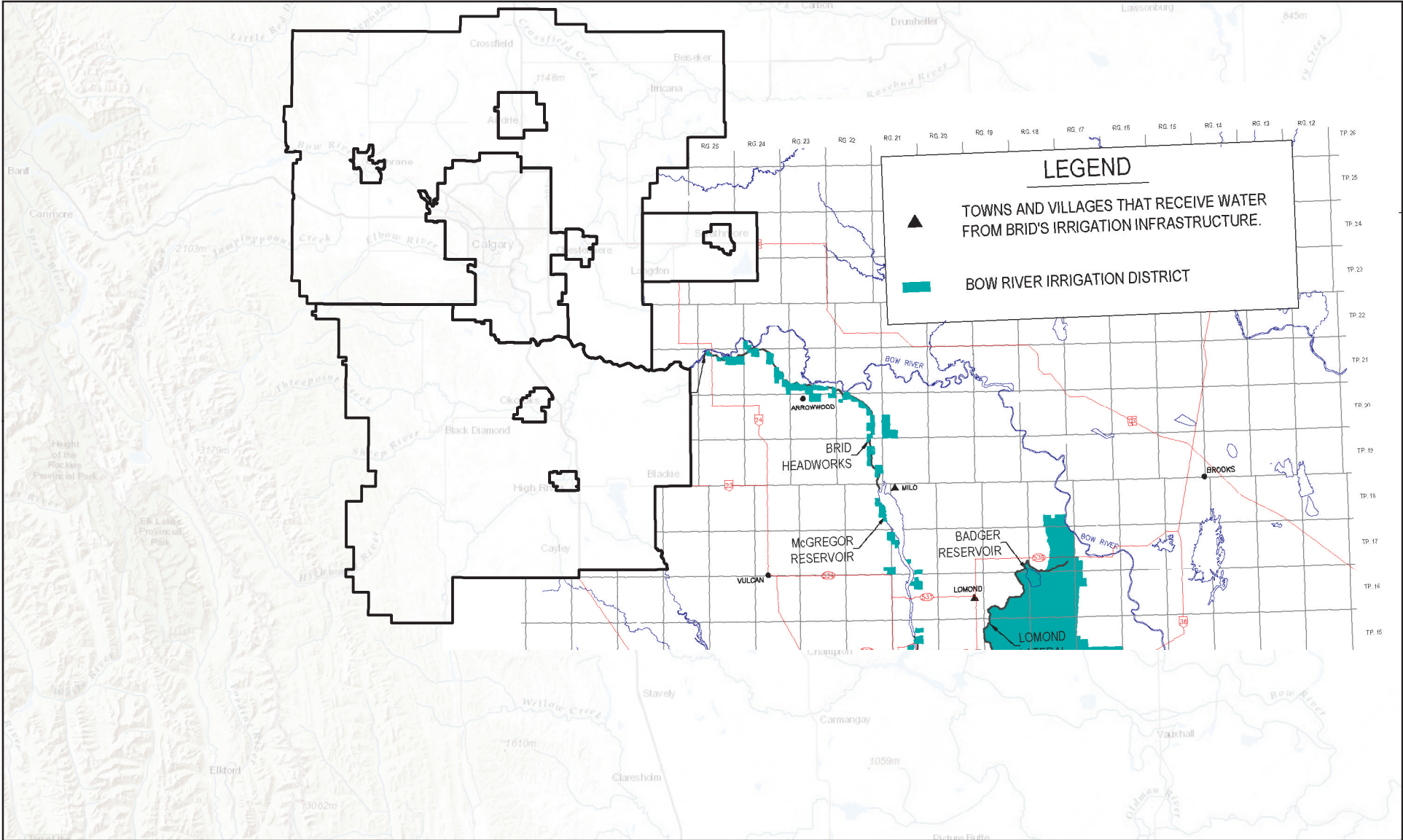
**Calgary Metropolitan  
Region Board**

**Fig 2: Western Irrigation District  
within the CMRB**



Data Sources: Western Irrigation District  
Map Created: 2019-12-13

*Map are for reference purposes only. The CMRB provides no warranty, nor accepts any liability arising from any incorrect, incomplete, or misleading information.*



**Fig 3: Bow River Irrigation District downstream of the CMRB**



Data Sources: Bow River Irrigation District  
Map Created: 2019-12-13

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**Table 1: Key Themes and Opportunities Regarding CMR Stormwater Management**

Intermunicipal Priority	Concern	Policy Goal / Outcome	Theme	Potential Regional Opportunities	Priority Ranking
<p>Drinking Water Quality for Public Health and Safety</p> <p>Affordability of Water Treatment</p> <p>Water quality for ecosystems and downstream users</p>	Runoff pollutants from urban landscapes within CMR municipalities	<p>High quality water for public health and ecosystem benefits</p> <p>Source water protection: Land use development is managed to safeguard the basin’s high quality source water.</p> <p>Drinking water treatment in the CMR is affordable for customers</p>	Watershed Planning and Collaboration	<ol style="list-style-type: none"> <li>1. For the 6 sub-watersheds with WPAC or WSG plans in place, ensure water quality objectives are acknowledged in statutory plans, where appropriate.</li> <li>2. Support intermunicipal sub-regional cooperation initiatives by connecting interested parties and sharing report information.</li> <li>3. Advocate for stewardship activity for the 8 sub-watersheds that are not currently represented by a WPAC or WSG to establish watershed-specific quality and quantity objectives, where the need exists.</li> <li>4. CMRB participate with other sub-watershed users to understand total loadings, cumulative effects and infrastructure (point and non-point sources) operation impacts (e.g. Government of Alberta Phosphorus Management Plan).</li> <li>5. Advocate to Government of Alberta and other groups for water quality objectives and action plans for key upstream lands outside CMR.</li> <li>6. Promote existing initiatives of Government of Alberta, Alberta Agriculture and Forestry, Irrigation Districts, Cows and Fish, Ducks Unlimited, Alberta Water Council and others</li> <li>7. Ensure that stormwater management outcomes are guided by MGA and reflected in implementation of CMRB ESA criteria.</li> </ol>	High
	Runoff pollutants from agricultural landscapes within CMR municipalities				
	Runoff pollutants from land use within municipalities upstream of CMR				
	Runoff pollutants from land use within Crown lands upstream of CMR				
Management of Nutrient Loading	<p>Nutrient loading in stormwater releases reduces assimilative capacity for wastewater return flows</p> <p>Total Loadings Management restricts Effluent Return</p>	<p>Stormwater and wastewater releases are managed to safeguard watershed health</p> <p>Reduce stormwater nutrient loading in lieu of costly upgrades to water and</p>	Watershed Planning and Collaboration	<ol style="list-style-type: none"> <li>8. Advocate and/or participate in ongoing nutrient loading management strategies, where applicable</li> </ol>	High

<b>Intermunicipal Priority</b>	<b>Concern</b>	<b>Policy Goal / Outcome</b>	<b>Theme</b>	<b>Potential Regional Opportunities</b>	<b>Priority Ranking</b>
	(WWTP) which includes stormwater impacts from upstream users	wastewater treatment facilities to meet targets			
Protection of People, Land, Property and Ecosystems	Overland flooding* can result in injury or death  Damage to property and ecosystem from flooding*, stormwater management facilities overflow and stream migration	Control discharge runoff flows to pre-development or lower flows, and/or volumes where applicable  Keep rivers and surrounding natural areas healthy by reducing the impact of urban activities and development	Collaboration	9. Ensure ongoing work related to riverine flooding reflects mitigating risk to people 10. Ensure consistent watershed-specific outcomes among stormwater management plans for intermunicipal sub-watersheds. 11. Ensure that stormwater management outcomes are guided by MGA and reflected in implementation of CMRB ESA criteria. See also policy on flood-prone areas work	High
Stormwater Use	Capture and use stormwater for non-potable use, thus reducing water diversions.	Ensure timely approvals for potential re-use opportunities;  Identify and explore use of alternate water supplies to augment municipal services  Mitigate public health risk associated with contact with stormwater	Advocacy and Collaboration	12. Work with AEP and Alberta Health to establish accelerated guidelines and approval mechanisms for stormwater use. 13. Once provincial stormwater use guidelines have been released, develop a CMR-specific Code of Practice for stormwater use for non-potable applications. 14. Quantify and communicate the balance between stormwater use and ability to meet instream objectives for river health, and plan accordingly	High
Increase Public Utilization of Stormwater Infrastructure	Balance the protection of human safety/health and opportunity for use of stormwater infrastructure as recreation assets/amenity	Stormwater infrastructure is seen an asset to communities	Collaboration	15. Catalogue management practices of stormwater infrastructure ponds and recreational amenity management 16. Catalogue approaches by municipalities in the CMR to support discussions with citizens and development community on opportunities in greenfield and established areas (e.g., contact versus non-contact amenity)	Low

\*Note that policy on flood-prone areas, riverine flooding and environmentally sensitive areas (ESAs) are under separate cover. Where flooding is mentioned here, it is referring to localized flooding related to stormwater

In CMR, source water refers to surface water and groundwater under direct influence.  
This table is to be read with accompanying background report