

Source Water Protection Plan – Summary Report from Internal Stakeholder Drop-In Sessions

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Engagement Overview

In collaboration with The City's Water Resources and Engage teams, CH2M facilitated two internal stakeholder drop-in sessions, February 22 and 28, 2017, at the Calgary Municipal Building and the Calgary Water Centre, respectively. The desired outcomes of these drop-in sessions were to provide the opportunity for City staff to learn about the Source Water Protection (SWP) Plan project, provide input to help define management priorities to protect Calgary's water supply, and find opportunities to enhance coordination between business units. Participant input will be used to help the Water Resources Team develop key priorities, goals, and management actions for the SWP Plan.

Input from drop-in session participants was collected through interactive prioritization tasks and written and verbal comments. The drop-in sessions were set up to, first, present participants with introductory poster boards with maps and SWP background information, creating a narrative and providing context regarding SWP, followed by interactive poster boards that used sticky dots (dotmocracy) and sticky notes to collect participants' SWP priorities and comments. Technical experts were available throughout the sessions to answer participant questions. The three main topics that participants were asked to prioritize and provide feedback on were:

1. SWP goals
2. SWP concerns
3. Possible SWP management options

A total of 65 people participated in the two internal stakeholder drop-in events. This report presents the results of the prioritization tasks, as well as all comments shared by participants, verbatim. CH2M will use the feedback collected from these internal stakeholder engagement events to inform the methods and desired outcomes for future external stakeholder engagement efforts.

What We Heard

Summary of Input

Through the interactive prioritization tasks (dotmocracy), participants prioritized the following SWP goals, concerns, and possible management options:

- Participants identified **clean water, public health, and health of the environment and watershed** as their top three SWP goals; many participants noted the inter-relatedness of these three goals.

- Participants identified **wastewater, urban and suburban development, and communities and housing upstream from Calgary** as their top three SWP concerns.
- Participants identified **watershed assessment and risk studies, technical modelling studies, and water quality monitoring and assessments** as research and knowledge management options of high importance.
- Participants identified **land use restrictions, stormwater runoff policies and stormwater discharge requirements for new developments, and increased citizen education** as management options *within* The City's jurisdiction of high importance.
- Participants identified **knowledge-sharing among jurisdictions, communication between water managing agencies regarding spills and releases, limiting recreation on Bearspaw Reservoir, and supporting implementation of agricultural best practices for watershed protection** as management options *outside* of The City's jurisdiction of high importance.

Source Water Protection - Goals

Using interactive poster boards and sticky dots (dotmocracy), participants were asked to prioritize their top three SWP goals from the following list:

- Clean Water
- Public Health
- Health Environment and Watershed
- Community and Stakeholder Impact
- Affordability
- Other Community Values (for example, economic competitiveness)
- Other

Participants identified clean water, public health, and health of the environment and watershed as their top three SWP goals; many participants also noted the inter-relatedness of these three goals. Figure 1 shows the full results of the SWP goals prioritization task.

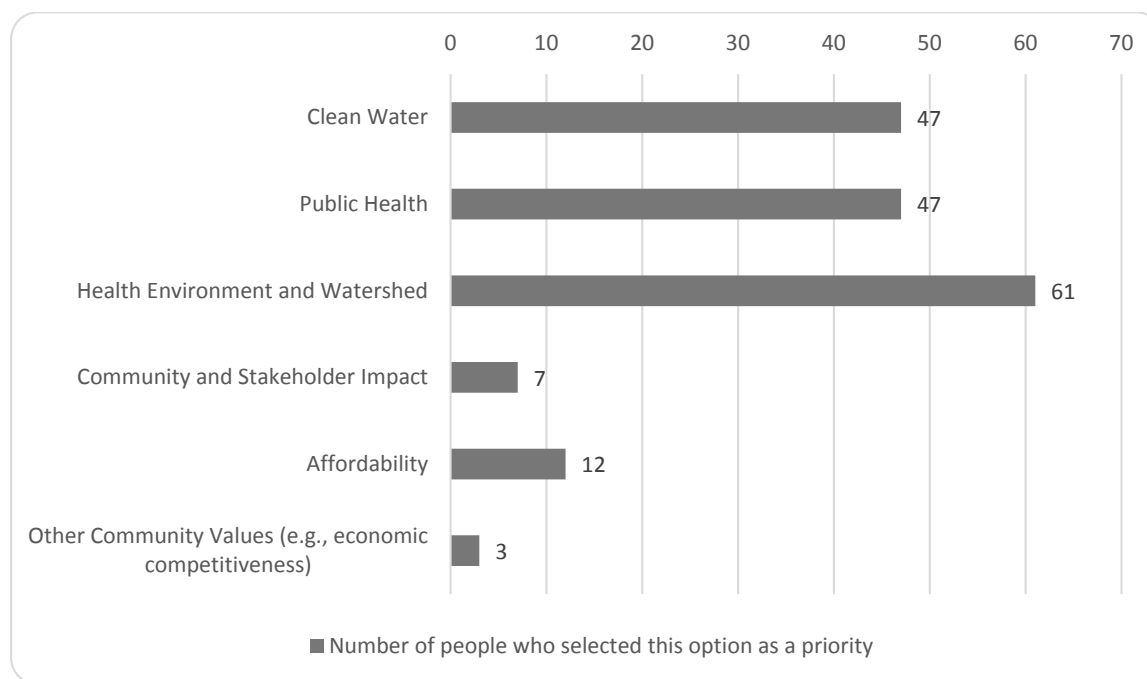


Figure 1. Results of SWP Goals Prioritization Task

Participants were then asked to provide comments using interactive poster boards and sticky notes regarding their selected SWP goals. Participant comments for each of the SWP goals are presented verbatim as follows:

Clean Water

- *Clean water involves the natural environment & human treatment and is critical. Let the environment help as much as it can to limit the treatment costs.*
- *Clean source water will be one of the most important influences on the rest of the [source water protection goals] categories.*
- *Our watershed is vital for communities; better source water means treatment is more cost effective.*
- *This is a basic need and cannot be compromised.*
- *Reliable source providing a healthy and affordable basic need.*
- *Clean water in watersheds is less treatment level in our plants and less investment of money.*
- *I feel if clean water is a goal, public health and environmental health are included.*
- *Clean water and public health are intertwined; you can't protect public health without clean source water. Source water is the greatest threat to clean water.*

Public Health

- *Protect quality of water used as drinking for Calgary and other communities from chemical and microbiological contaminants from stormwater, sewer and treated wastewater.*
- *Greater uncertainty in protection of public health with developed/impacted source water areas.*
- *Clean water and a healthy watershed are integral to our ability to protect public health.*
- *Interconnected under all headings: clean water, health and healthy environment.*
- *City's commitment to providing clean, safe drinking water.*
- *If public health is protected, likely have reasonably clean source water.*
- *As a city, we are the stewards to this and it should be non-negotiable.*

Health Environment and Watershed

- *Protect source watershed to maintain health of aquatic and riparian habitats*
- *Without this you don't have the others!*
- *Healthy watershed is paramount as it leads to clean water, public health and affordable treatment.*
- *Healthy watershed benefits everyone including animals, plants, air and water.*
- *Definitely public health and environmental protection; they work closely with clean water.*
- *Healthy environment and watershed I believe is the most important piece, dictates public health and clean water.*
- *Water that is free from contaminants for public consumption as well as aquatic life; interrelated with clean water.*
- *Difficult to achieve clean water/public health without protecting watershed.*

- *It's about more than protecting humans.*
- *Healthy watershed equals a more resilient watershed.*
- *Public health and clean water are, I think, products of a healthy environment and watershed.*
- *Healthy riparian areas will benefit: SWP, improved health of rivers, and fisheries and wildlife movement and habitat.*
- *Healthy environment and watershed = clean water = public health.*
- *Monitoring and sampling helps understanding and evaluating the state of the watershed.*

Community and Stakeholder Impact

- *Balance water quality goals with needs of community and stakeholders, allowing appropriate recreational uses and environmentally conscious development.*
- *How do we control/affect action outside of our jurisdiction?*
- *The impact to the rivers/nature is more important than the impact to citizens and users.*
- *Education and enforcement regarding impact by stakeholder and community activities will benefit clean water and healthy environment and watershed.*
- *Not only impacts, it is about getting others to do the right thing.*
- *Communities and other watershed stakeholders (e.g. agriculture, oil, forestry, and recreation) drive watershed health.*
- *Education is required so that expectations are set at the start.*

Affordability

- *Conservation and prevention of contamination will always be more cost effective than treatment.*
- *Let the environment do the treatment; reduce costs.*
- *Affordability and feasibility also important; can't realign a highway to avoid spills...*
- *Solutions/recommendations need to be accompanied by a triple bottom line analysis of benefits.*
- *Affordability is always a concern. Funding source/cost to the city/consumer has to be considered*
- *The "how" (methods) of achieving clean water, public health and healthy environment can address affordability.*
- *Feasible/level of control: what can we achieve versus what can we influence (e.g. transport, forestry practices.)*
- *Watershed protection makes good business sense as many other jurisdictions have learned. We cannot afford to not protect our watershed.*
- *Drawing link to "affordability" and the state of upstream watershed. Water treatment plant can be costly to deal with upstream but should they? Where is the best place to invest?*

Other Community Values (e.g., Economic Competitiveness)

- *Other communities should be included in steps to protect for mutual benefits and collaboration!*
- *No water, no development!*
- *Protecting the environment: necessity or nice to have? cost?*

- *Is having an undeveloped upper watershed a luxury? Many large cities don't have this, why can Calgary say this is necessary for us?*
- *What are the biggest risks to source water protection? Can we address these risks?*
- *Provides opportunity for growth and development.*

Other

- *Long range plan for water supply as source runs out.*
- *Have you considered the South Saskatchewan Regional Plan, Water Quality Framework in this project?*
- *Session does not include drinking water treatment plant, distribution system, or customer satisfaction, which are all part of the multi-barrier approach.*
- *Water treatment plant can recover (eventually) from forest fire but not stormwater contaminants.*

Source Water Protection – Concerns

Using interactive poster boards and sticky dots (dotmocracy), participants were asked to prioritize their top three SWP concerns from the following list:

- Commercial Use
- Wildfire
- Agricultural Impacts
- Wastewater
- Urban and Suburban Development
- Communities and Housing Upstream from Calgary
- Oil and Gas
- Weather-related Disasters
- Forestry
- Recreational Use

Participants identified wastewater, urban and suburban development, and communities and housing upstream from Calgary as their top three SWP concerns. Figure 2 shows the full results of the SWP concerns prioritization task.

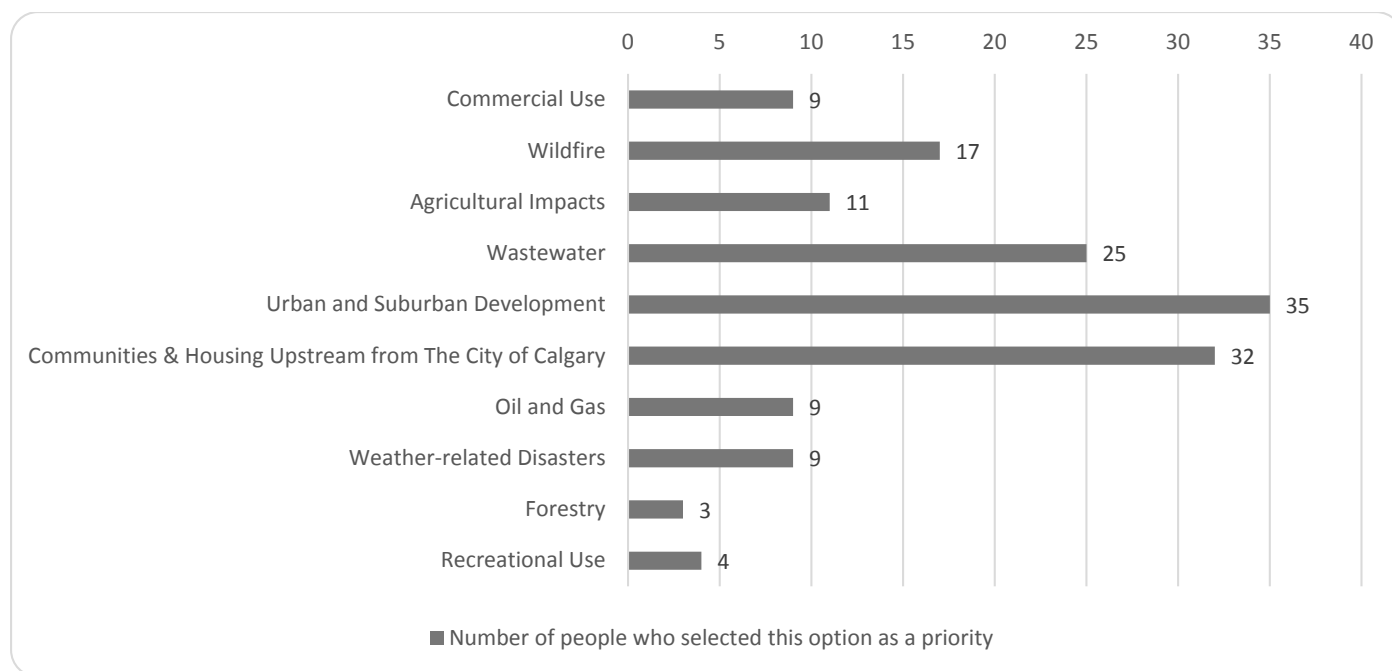


Figure 2. Results of SWP Concerns Prioritization Task

Participants were then asked to provide comments using interactive poster boards and sticky notes regarding their selected SWP concerns. Participant comments for each of the SWP concerns are presented verbatim as follows:

Commercial Use

- *Footprint of industrial factories (e.g. concrete); emissions and waste water.*
- *Potassium/mining plant at Lac des Arcs.*
- *Increased commercial development and recreational use.*
- *Transport: highway and rail.*

Wildfire

- *Changes in natural organic matter making the water temporarily or permanently more difficult to treat for drinking water purposes, especially during high flow periods.*
- *Wildfire presents a large probability of occurrence in this area and unknown potential contamination of water treatment. Water treatment capabilities are unknown for fire-impacted contaminants (e.g. Fort McMurray).*
- *Short term vs long term impacts - short-term contamination vs. continuous contamination from anthropogenic sources (e.g. waste water that can be controlled vs. natural wildfire cycles.)*
- *Natural vs. anthropogenic - weigh benefits for requirement of fire in natural ecosystem (e.g. pine beetle control, germination of pine seeds.)*
- *Difficult to manage; should look at how we can re-establish riparian areas quickly.*

Agricultural Impacts

- *Fertilizer, pesticide runoff; e-coli contamination from livestock/horse manure; erosion and sedimentation from pooping (trampling) riparian zones.*
- *Intensive agriculture can introduce nutrients, suspended solids and pesticides that can seriously degrade water quality and can also introduce Emerging Substances of Concern (ESOC) (i.e. veterinary pharmaceuticals, natural and synthetic hormones.)*

- *Pesticides; concern to the source with contamination.*

Wastewater

- *Water quality impacts, increased nutrients, increased contaminants, decreased dissolved oxygen and increased volume and flow rates.*
- *Direct proximity of the wastewater treatment plant in Rockyview a concern (close to Raw 1.)*
- *Impact grows with population; hard to remove a wastewater treatment plant later if impact is too high.*
- *Look at regional lines that divert flows around drinking water intakes.*
- *Population growth and development, amount of waste water with population growth, and aged infrastructure.*
- *Are all the wastewater discharges to the stream monitored?*
- *As stewards, we should try to prevent this through policy and regulation.*

Urban and Suburban Development

- *Residual contaminants present in treated and untreated wastewater, including pesticides and ESOs (i.e. pharmaceuticals and endocrine disrupting compounds), can be harmful to the aquatic environment, can be difficult to remove during drinking water treatment and potential human health risks upon long-term exposure are not yet fully understood.*
- *Storm water inputs from developed areas can degrade water quality and introduce pesticides and ESOs (i.e. microplastics, plasticizers, surfactants) which are difficult to remove during drinking water treatment, can be harmful to aquatic life and risks to human health on long-term exposure are not fully understood.*
- *Increased development pressures, urbanization, and imperviousness.*
- *We still have many questions about stormwater and still don't even control sediments well. Also, no spill control provisions right now.*
- *Increased development and communities right outside Bearspaw water treatment plant.*
- *Impact from drainage and outfalls to the source water during runoff for water quality.*
- *City of Calgary needs to ensure own house is in order when it comes to source water protection (i.e. stormwater impacts.)*
- *Be aware of activities that might impact our source water and mitigate risks (e.g. developments, Southwest ring road upstream.)*
- *Increased number of transportation corridor crossings potential to impact source water (e.g. channel erosion, spill potential.)*
- *Storm and wastewater are my biggest risks.*
- *Often, market desires (from developers) put pressure on us to allow development in non-developable areas.*

Communities and Housing Upstream from Calgary

- *Urban/suburban development in upstream areas present high proximity risks to drinking water sources; stormwater can have a large impact.*

- *Urban development could lead to small but cumulative impacts to source waters (e.g. nutrient loadings changing trophic state of rivers/reservoirs.)*
- *Small scale water treatment of country residential communities upstream and the larger number of them.*
- *Increased demand on resources, more development = more risks to source water.*
- *We have little control on this so have to adapt as it happens.*
- *Not recoverable like wildlife*
- *City of Calgary has no control and is at the mercy of other parties who have limited resources and little to no expertise.*
- *Upstream development communities and housing can have impacts such as pesticides, herbicides and other contaminants that can threaten our reservoirs and drinking water.*

Oil and Gas

- *Fracking, contamination of groundwater.*
- *Perception may be high that this is a big risk; may be worth providing data.*
- *Fracking may likely contaminate ground water and gas leaking has negative impact on environment.*
- *Oil and gas standout for me; it would be very challenging to mitigate or prevent a disaster.*
- *Number of leaks per thousand kilometer of pipelines, access via cut lines and exploration lines, oil wells (maintaining and operation; reclamation, if any). Exploitation and production is at the core of the business, not protection of environment.*
- *Who will manage oil and gas infrastructure when industry is no longer viable?*

Weather-related Disasters

- *Water quality affected by intense rain.*
- *Complementary/synergistic linkages to provincial/city flood policy and regulations?*
- *Weather related disasters could be for short term.*
- *Drought? Low flows.*

Forestry

- *Clear cutting represents issues in form of slope stability.*
- *Concerned about clear cutting and run-off of sediments into rivers.*

Recreational Use

- *Opportunity for public awareness and how citizens have a role.*
- *Disturbance of fish habitat (hatching), especially ATVs!*
- *Concern that non-motorized recreation use may be limited when other impacts are much more significant (i.e. direct storm water drainage) and should be targeted first.*
- *Recreational uses by residents may introduce contaminants, risk high proximity to Raw 1 (e.g. engine oil.)*
- *Uncontrolled point source pollution and riparian degradation.*

Other

- *General household and commercial consumption should be addressed.*
- *We need to understand how climate change affects our source water.*

Source Water Protection - Management Actions

Management Actions: Research and Knowledge

Using interactive poster boards and sticky dots (dotmocracy), participants were asked to rank the importance (low, medium, or high) of the following possible SWP research and knowledge management options:

- High level technical watershed assessment and risk prioritization studies
- Detailed technical modelling studies predicting future water quality, travel time zones, and specific impacts
- Case study reviews and interviews of other jurisdictions to determine best practices
- Water quality monitoring, data management, and assessment
- Ongoing knowledge and research into the impacts of wildfire on drinking water supplies in Calgary

Participants identified watershed assessment and risk studies, technical modelling studies, and water quality monitoring and assessments as research and knowledge management options of high importance. Figure 3 shows the full results of the importance ranking task regarding SWP research and knowledge options.

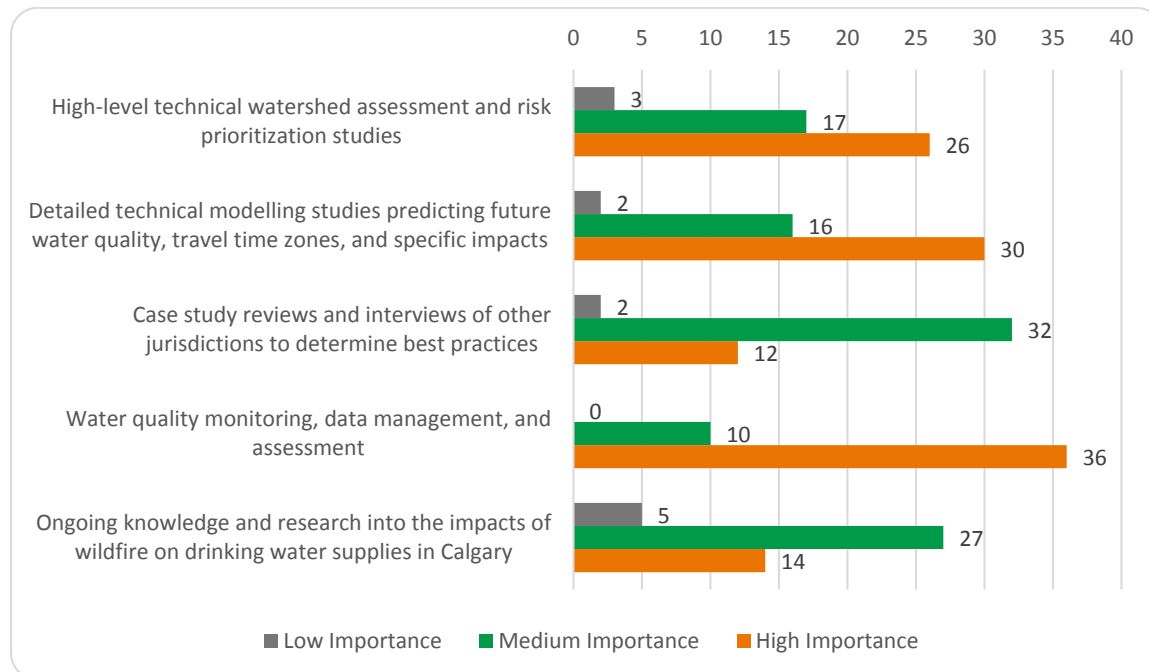


Figure 3. Results of Ranking Importance of Research and Knowledge Options

Management Actions: Within The City of Calgary's Jurisdiction

Using interactive poster boards and sticky dots (dotmocracy), participants were asked to rank the importance (low, medium, or high) of the following possible SWP management options *within* The City's jurisdiction:

- Establish land use restrictions to prohibit the highest risk land uses
- City of Calgary purchases land in vulnerable areas
- Develop custom policies and design specifications to manage stormwater runoff quality from the new developments surrounding the Glenmore and Bearspaw Reservoirs
- Promote green infrastructure pilots to reduce runoff

- Require any new developments to discharge stormwater downstream from our drinking water supplies
- Design and build additional stormwater retrofits in established communities to reduce pollution of our reservoirs
- Increase citizen outreach and education on best practices to protect our source water
- Limiting recreation on the Glenmore Reservoir to minimize contamination of our drinking water

Participants identified land use restrictions, stormwater runoff policies and stormwater discharge requirements for new developments, and increased citizen education as management options *within* The City's jurisdiction of high importance. Figure 4 shows the full results of the importance ranking task regarding management options *within* The City's jurisdiction.

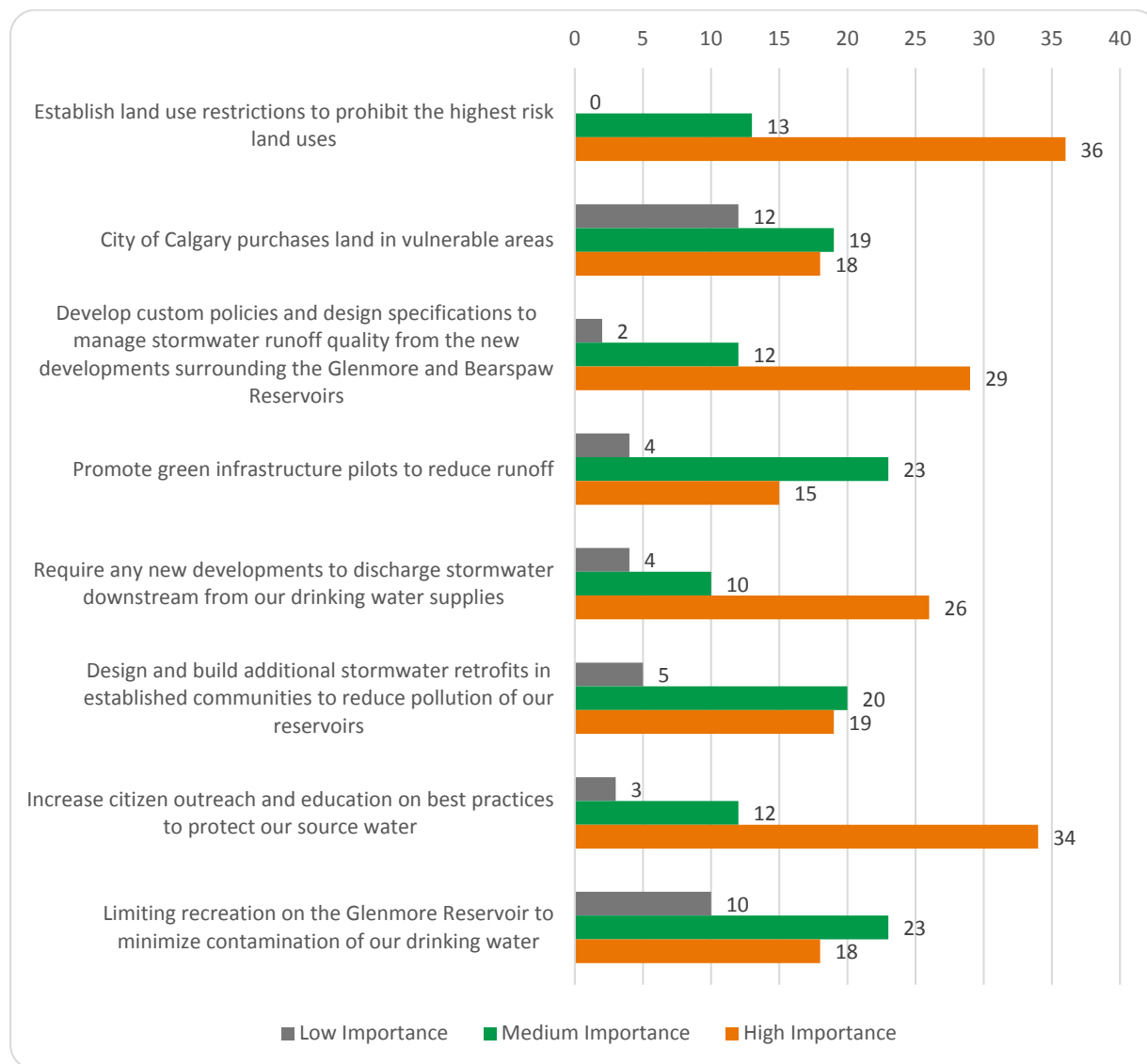


Figure 4. Results of Ranking Importance of Management Options *Within* the City of Calgary Jurisdiction

Participants also had the opportunity to provide comments using interactive poster boards and sticky notes on the possible management options *within* The City's jurisdiction. Participant comments are presented verbatim as follows:

Establish Land Use Restrictions to Prohibit the Highest Risk Land Uses

- *For example...? (ATVs, industrial activities.)*
- *Possible Municipal Government Act revisions (e.g. Environmental Reserve designation, protecting sensitive lands.)*

City of Calgary Purchases Land in Vulnerable Areas

- *...and does not develop it.*
- *Feasible? Challenges may include cost/funding, landowner issues and logistics.*

Develop Custom Policies and Design Specifications to Manage Stormwater Runoff Quality from the New Developments surrounding the Glenmore and Bearspaw Reservoirs

- *Having this would cut down on work for each development approval/consultation.*

Promote Green Infrastructure Pilots to Reduce Runoff

- *Yes, very important in view of the climatic impacts (e.g. more precipitation in winter.)*

Require any New Developments to Discharge Stormwater Downstream from our Drinking Water Supplies

- *Ideal situation; may not be sustainable as development continues upstream.*

Design and Build Additional Stormwater Retrofits in Established Communities to Reduce Pollution of our Reservoirs

- *Are the cost/benefits of this known? For instance, how much does a storm pond improve conditions?*

Limiting Recreation on the Glenmore Reservoir to Minimize Contamination of our Drinking Water

- *Not a big risk if non-contact and non-motorized. Weigh risks with benefits of an active population that interacts with their watershed (health and appreciation.)*
- *May not be an immediate large risk but could have cumulative impacts. Politically easier to maintain limited recreation than allow it and then reverse decision.*

Other

- *The greater good should be of greater concern than citizen input; we have the experts.*
- *While it may be necessary for planning purposes to prioritize these options, all of these management options are important for source water protection planning.*

Management Actions: Outside The City of Calgary's Jurisdiction

Using interactive poster boards and sticky dots (dotmocracy), participants were asked to rank the importance (low, medium, or high) of the following possible management options *outside* The City's jurisdiction:

- Working with other stakeholders to ensure drinking water protection is considered in wildfire management strategies
- Increased citizen education and outreach in communities outside of Calgary
- Knowledge-sharing among the different jurisdictions

- City funding to assist land trust organizations to acquire land or conservation easements in vulnerable areas of the source watershed
- Ensure communication between the province, emergency management agencies, and water system operators on notification of spills and releases
- Support watershed planning and policy through participation with the non-government groups
- Limiting recreation on the Bearspaw Reservoir to minimize contamination of our drinking water
- Support and encourage the implementation of agricultural Best Management Practices for watershed protection

Participants identified providing knowledge sharing among jurisdictions, ensuring communication between water managing agencies regarding spills and releases, limiting recreation on Bearspaw reservoir, and implementing agricultural best management practices for watershed protection as management options *outside* The City's jurisdiction of high importance. Figure 5 shows the full results of the importance ranking task regarding management options *outside* The City's jurisdiction.

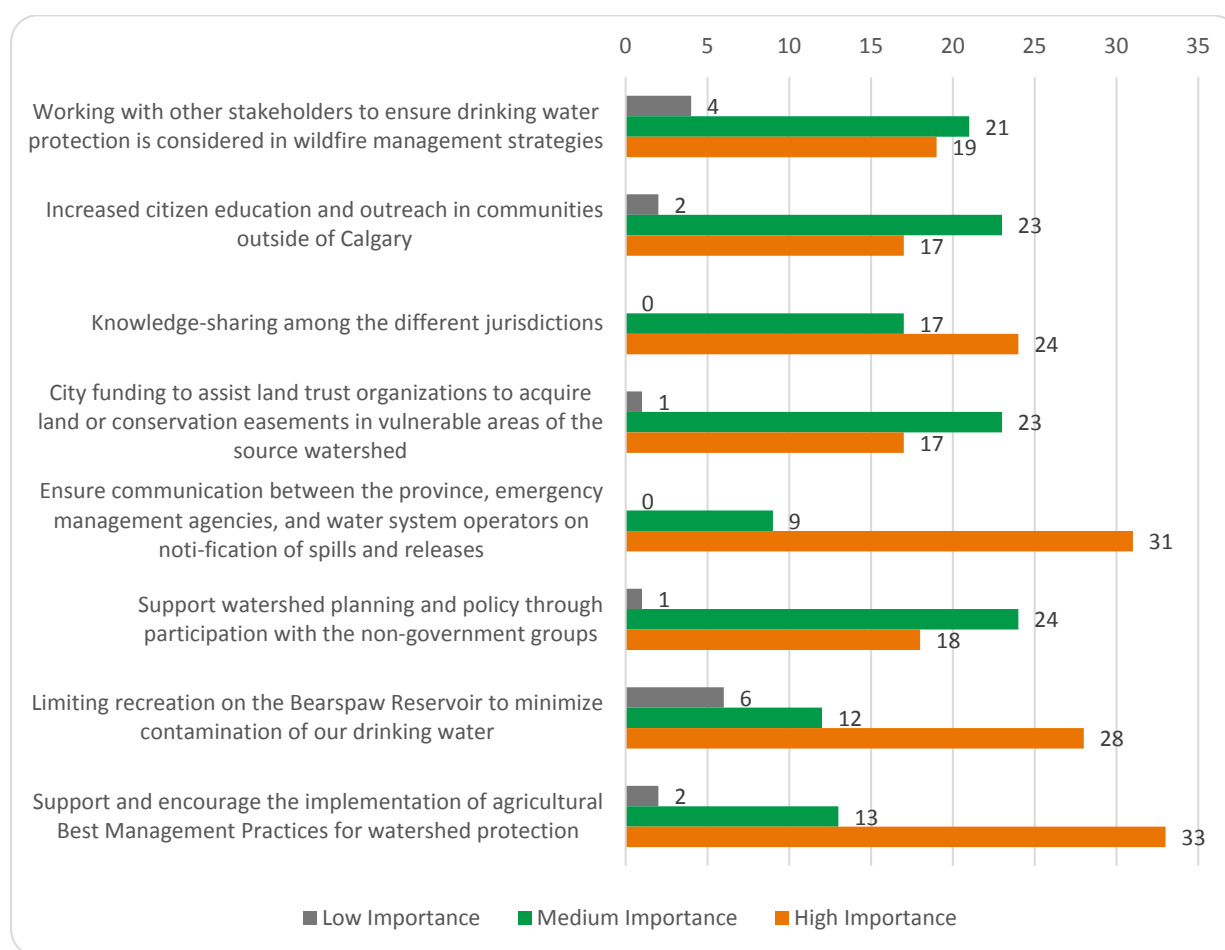


Figure 5. Results of Ranking Importance of Management Options *Outside* the City of Calgary Jurisdiction

Participants also had the opportunity to provide comments using interactive poster boards and sticky notes on the possible management options *outside* The City’s jurisdiction. Participant comments are presented verbatim as follows:

Ensure Communication between the Province, Emergency Management Agencies, and Water System Operators on Notification of Spills and Releases

- *Is this already fairly established?*

Support Watershed Planning and Policy through Participation with the Nongovernment Groups

- *What kind of non-governmental organizations?*

Limiting Recreation on the Bearspaw Reservoir to Minimize Contamination of our Drinking Water

- *Important to protect as majority of drinking water source, but under high development pressure. Lots of citizens interest in using for recreation/boating.*

Other

- *Suggest that all interactive boards have space for “other” comments.*
- *Explore opportunities for YYC to obtain and treat wastewater from upstream communities to decrease amount of wastewater effluent released to our source water.*
- *Are City of Calgary staff going to be involved in the public engagement piece?*