City of Kelowna

Water Security Plan

Our approach to responsible water management

April 2025

City of Kelowna

City of Kelowna

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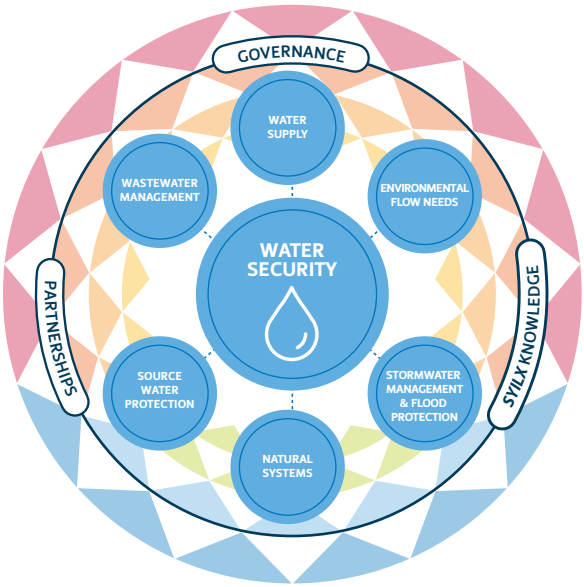
LAND ACKNOWLEDGEMENT

Kelowna is located on the traditional, ancestral, unceded territory of the *syilx*/Okanagan people. We recognize the deep relationship and connection the *syilx*/Okanagan people have with siwɬkʷ (water), and respect their knowledge, values, responsibilities, and rights to protect siwɬkʷ. This Plan reflects a commitment by the City of Kelowna to work with local First Nations to incorporate these values into water security management and best practices.

Executive Summary

The City of Kelowna is developing its first Water Security Plan, which is a comprehensive strategy to ensure a more holistic approach to how we use, protect and share water, now and in the future. The actions included in this Water Security Plan focus on ways the City of Kelowna can ensure long-term security in the supply and quality of our water and build understanding and awareness of the shared responsibility of partners and community members to sustainably manage water in the Central Okanagan.



This version encompasses three foundational elements, six key sectors and a total of 39 actions for water management.

The six sectors should not be viewed as completely separate, distinct areas. Each sector affects the other and best management practices need to consider the impacts on all these areas to improve water responsibility. For example, Kelowna discharges treated wastewater effluent into Okanagan Lake, which is also the source of water supply for Kelowna and other communities.

Foundational Elements:

- *syilx* Knowledge
- Partnerships
- Governance

Key Water Sectors:

- Water Supply
- Environmental Flow Needs
- Stormwater Management & Flood Protection
- Natural Systems
- Source Water Protection
- Wastewater Management

VISION

Water management in Kelowna is approached from a holistic, "one water," lens that guides decision-making and long-term planning, reflecting the importance of water for our communities and our environment.

GUIDING PRINCIPLES

- **All residents and water users in the City have a safe, affordable, resilient and sustainable supply of high-quality drinking water and a reliable supply of water for agriculture.**
- **Protect Okanagan Lake, our human health, and our environment through efficient collection and effective treatment of wastewater.**
- **Stormwater is effectively managed without negatively impacting riparian areas, infrastructure, property, or Okanagan Lake.**
- **The community is resilient and resistant to lake and creek flooding.**
- **Okanagan Lake and upland watersheds remain a source of high-quality water.**
- **Account, protect, restore, and enhance natural systems that make up our asset inventory and increase environmental resiliency.**
- **Assure that the quality and quantity of water is available to support a healthy aquatic ecosystem.**
- ***syilx* knowledge, practice and permitting is effectively incorporated into water decision processes.**
- **The City works in partnership with other water providers and government agencies to ensure water security.**

1.0 INTRODUCTION

The City of Kelowna is developing its first Water Security Plan, a comprehensive strategy to ensure a more holistic approach to how we use, protect and share water, now and in the future. The actions included in this Water Security Plan focus on ways the City of Kelowna can ensure long-term security in the supply and quality of our water and build understanding and awareness of the shared responsibility of partners and community members to sustainably manage water in the Central Okanagan.

Kelowna is located on the traditional territory of the *syilx* / Okanagan people. The *syilx* people believe that using siwɬkʷ, or water, must include an act of reverence and a commitment towards responsible use and stewardship. This includes a responsibility to the past, present and future generations to protect and restore siwɬkʷ. The Okanagan Nation Water Declaration (2014), states siwɬkʷ is not a resource or a commodity. Instead, siwɬkʷ "has the right to be recognized as a familial entity, a relation, and a being with a spirit who provides life for all living things."

Why does Kelowna need a Water Security Plan?

Kelowna doesn't own water. Instead we have limited rights to access water legislated through the Province. As Okanagan Lake supply is limited, it is important to use water responsibly. We must protect our lake and watershed to ensure future generations can continue to prosper. All residents, visitors and businesses in our community are responsible, directly or indirectly, for the quantity and quality of water that we use and return to the environment.

We rely on water for drinking, fire protection, agriculture and our community needs.

Water is a common thread that weaves together our cultures and community values.

We rely on Okanagan Lake for fun, recreation and as a safe source of drinking water.

Water management is vital to support the different and sometimes competing needs for water. The responsibilities around water management are multi-jurisdictional and complex. In the Okanagan, these needs include personal water demand, public health, agriculture, the environment, culture, and land use. These shared needs mean there are many partners and community members that share the responsibility to manage and use water sustainably.

Our water responsibilities are all related, from source, to creek, to lake, to tap, to wastewater and back to lake. Addressing our long-term water needs and responsibilities requires this holistic view where decision processes are looked at through a "water lens."

Part of the process to develop this plan included engagement with community members to gather feedback and understand the community's priorities related to water. Participants were asked to describe 'water security' and 'water responsibility' in their own words. The most common themes in the responses were:

WATER SECURITY

- Clean
- Safe
- Available / accessible
- Adequate / enough / sufficient
- For future generations
- Nature / ecosystems / environment
- Agriculture

WATER RESPONSIBILITY

- Not being wasteful
- Environmentally safe
- Minimizing water use for lawns/landscaping
- Future generations
- No contamination
- Changing our behaviours to protect water

Why water security?

The quality and supply of our water are challenged by the changing climate, an increasing population and over-consumption. Today, we are witnessing higher frequency and intensity of flood, fire and drought events, which are forcing us to adapt at a great expense. As the City of Kelowna's responsibilities related to water supply increase, organizational shifts are necessary to consider abroader holistic approach, and the need to consider decisions we make through a "one water" lens.

This shift is a step towards ensuring water security and responsibility are key considerations in the City's planning and decision-making processes, recognizing that safe and reliable water and sewer systems are fundamental services for the City. It also recognizes the need to plan for the future, especially in accommodating increasing needs as Kelowna's population grows, recognizing that using water responsibly now can save money in the future, and considering the role safe, reliable water plays as an economic driver for tourism and agriculture.

Overall, this approach aims to ensure that Kelowna, surrounding communities and First Nations in the Central Okanagan have a clean, healthy, adequate supply of water that meets our needs now and in the future.

> **"Our sacred siwɬkʷ connects and sustains all life. We as the *syilx* people have a duty and responsibility to ensure siwɬkʷ can maintain all of its relationships, known and unknown, by showing due respect and humility."**
>
> ***syilx* Water Declaration**

As we look into our future, we see a need to do better for ourselves and future generations. We recognize that *syilx* Okanagan knowledge and stewardship practices will be foundational in learning how to manage our water responsibilities in a way that sustains landscapes, fish and wildlife as well our communities. Finally, we commit to working collaboratively with other communities, agencies and organizations to understand each other's values, expectations and concerns related to preserving the water around us.

Purpose of this Plan

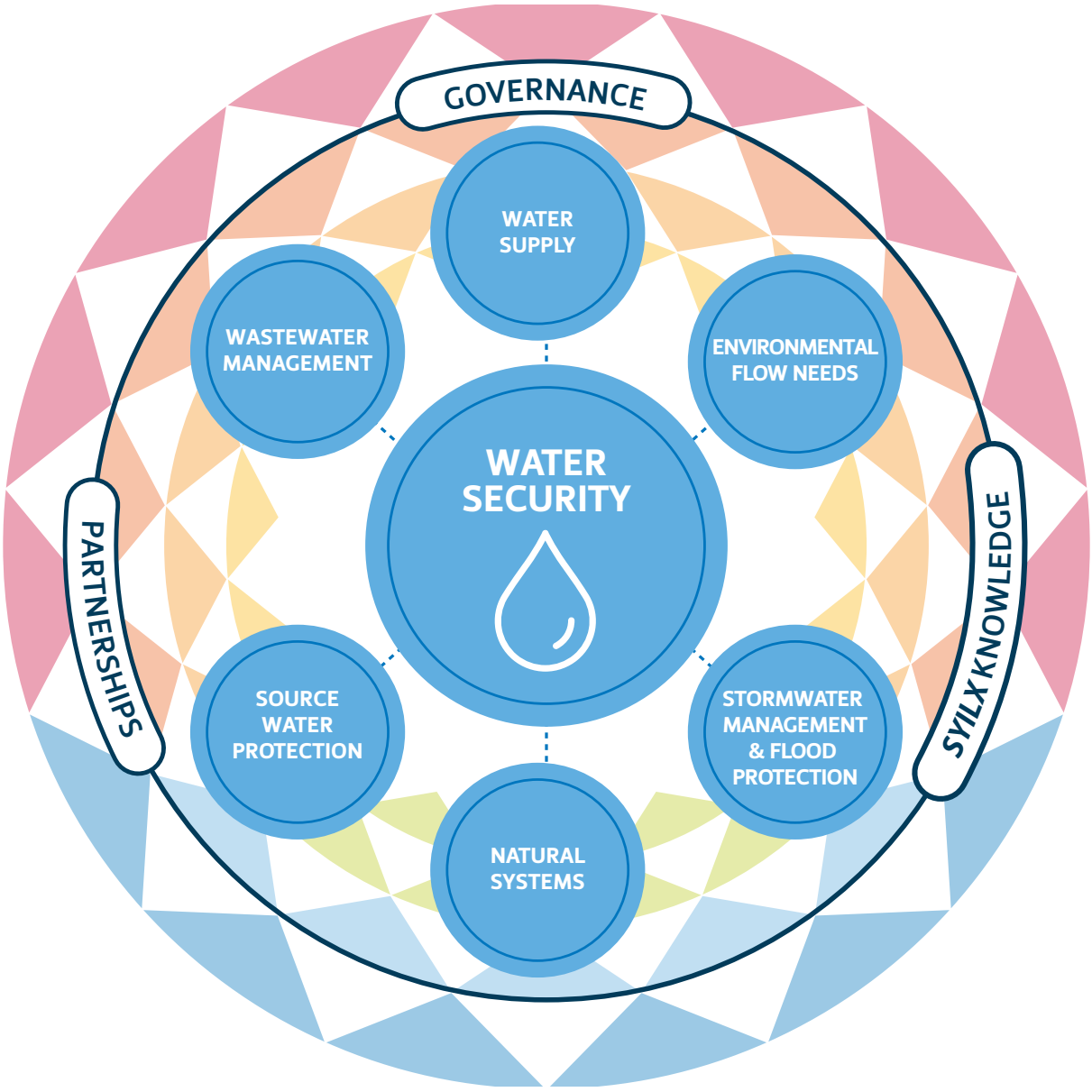
The purpose of this plan is to highlight the common needs, challenges and opportunities around water, then develop a vision and a strategic plan for the City to responsibly manage the water that is supplied to, consumed or flows through our community.

"One water" approach

This Water Security Plan takes a "one water" approach to water stewardship that promotes the integration of water management practices, whether water supports drinking, sanitation, agriculture, recreation or industry, the natural environment and more. This integrated approach involves coordinating between six key sectors of water management: water supply, wastewater management, environmental flow needs, source water protection, natural assets, and stormwater management and flood protection.

Working through a holistic water lens can ensure that we meet current needs without compromising the ability of future generations to meet theirs.

The City's "one water" approach to water management is reflected in the circle below, which shows how the six key sectors are supported by the three foundational elements of water security:

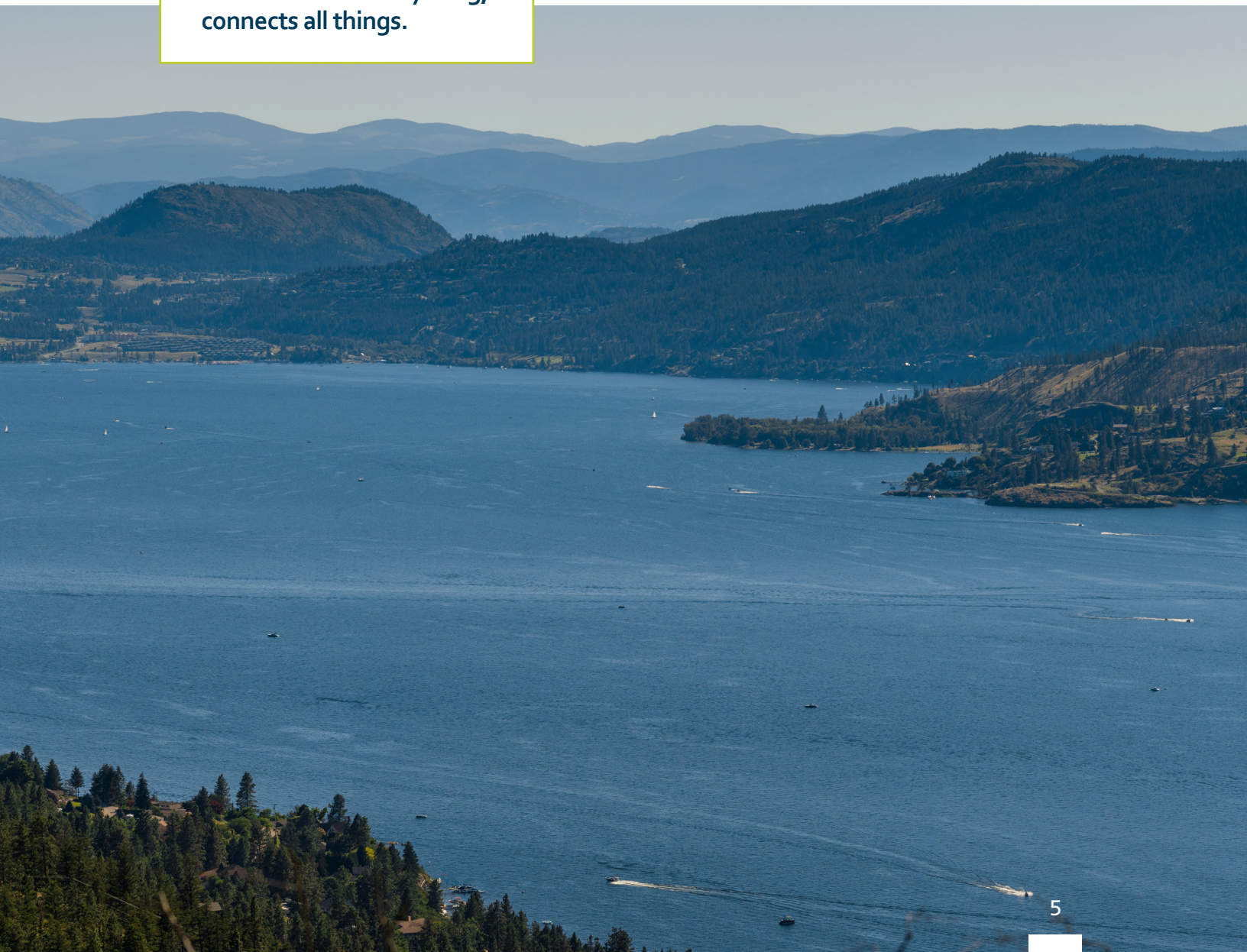


How will this Water Security Plan improve water management?

The Water Security Plan will establish a foundation for more collaborative stewardship of water in and around Kelowna by:

- Laying out strategies that focus on resiliency and responsibility of water.
- Defining the City's responsibilities and the interests of other partners in water responsibility in the Okanagan Lake basin.
- Aligning organizational policies, budgets and resource allocation decisions.
- Identifying sustainable funding sources and models to support achievable outcomes.
- Addressing the impacts of growth and climate change on water security.
- Underlining the importance of transparency, consultation and raising awareness.
- Proposing new best management practices to ensure efficient service delivery.

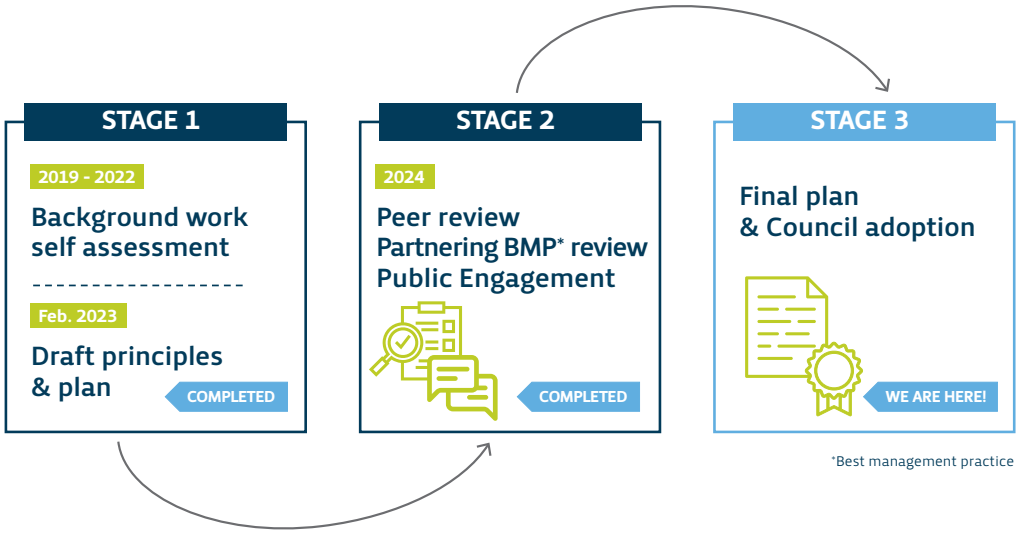
Water touches everything; connects all things.



2.0 DEVELOPING OUR WATER SECURITY PLAN

An area-based planning process was a direct recommendation from the Interior Health Authority (IHA) and the Auditor General for Local Government to address water management issues in and around the City of Kelowna. Area based plans were promoted through the province's *Water Sustainability Act*. The City and senior levels of government are also required and responsible for considering the application of Indigenous Rights and Knowledge in water management.

Development of the Water Security Plan involved a three-stage strategic planning approach to develop management practices to address water responsibility:



STAGE 1

INTERNAL REVIEW & ASSESSMENT OF CURRENT PRACTICES

Before determining how to improve the City's current water management practices and develop new approaches, we needed to understand the current risks, process gaps, opportunities and level of service to the community. An internal review and assessment of practices was undertaken to help identify areas to focus on in Stage 2.

STAGE 2

INTER-AGENCY COLLABORATION, PARTNERING & BEST PRACTICE REVIEW

There are many different communities, organizations and government bodies that rely on, and have a responsibility for, managing the Okanagan water basin. To effectively support water security in Kelowna, the requirements and expectations of other jurisdictions, agencies and interest groups need to be considered. During Stage 2, we determined the need to take a holistic approach to water management in the Kelowna-area basin. This includes expanding our understanding of traditional *syilx* values and knowledge related to water and wildlife protection and incorporating an environmental lens into our practices.

In June 2023, a workshop with key partners was held to gather input on the six key sectors included in this plan. This workshop included 34 representatives from 11 organizations, including the province, local governments, improvement districts, Interior Health and local businesses. Following group discussion about each of the six topics, participants were asked to determine three or four key themes or priorities for each sector. For the full peer review workshop summary, see **Appendix B**.

COMMUNITY ENGAGEMENT

After the draft Water Security Plan was developed, it was shared with the community for feedback on the vision and priorities included in the plan. Engagement took place in July 2024 and included a survey, information session and online question submission form. The plan was then refined based on the input from participants. For the full engagement summary report, see **Appendix C**. Staff met with members of Okanagan Nation Alliance and Okanagan Indian Band to obtain feedback on the updated version of the Plan in November 2024.

STAGE 3

FINALIZING THE WATER SECURITY PLAN

This plan is the result of assessments and internal reviews in Stage 1 and the input from other organizations and community members in Stage 2.

Water management planning in Kelowna

The Kelowna Water Security Plan is the culmination of several initiatives moving towards a more integrated, holistic approach to water management in Kelowna. Over the past decade, the City of Kelowna and its partners at the Province of British Columbia, Regional District of Central Okanagan (RDCO), Interior Health, Okanagan Basin Water Board (OBWB), and other local governments and irrigation districts have embraced more collaboration in adopting and implementing best practices in water management. Several key studies and plans have led to the development of this work:

2017: VALUE PLANNING STUDY

Identified concepts and solutions for a city-wide integrated water supply plan to ensure all Kelowna residents receive reliable high-quality water service.

2017: KELOWNA INTEGRATED WATER SUPPLY PLAN

Separated agricultural and domestic water systems and delivered sustainable water supply to agriculture in the South Mission.

2018: PROVINCIAL AUDIT OF WATER SUPPLY

Recommended the City undertake area-based water management planning to protect water quality.

2019: AREA BASED WATER MANAGEMENT PLANNING

Initiated to develop a strategic approach to water and watershed management to protect the City's water supply.

VISION

Water management in Kelowna is approached from a holistic "one water" lens that guides decision-making and long-term planning, reflecting the importance of water for our communities and our environment.

Our Guiding Principles

The following guiding principles for the Water Security Plan help lay out the priorities for the future of Kelowna's water use and responsibilities, and guide the actions identified in this plan.

GUIDING PRINCIPLES

- **All residents and water users in the City have a safe, affordable, resilient and sustainable supply of high-quality drinking water and a reliable supply of water for agriculture.**
- **Protect Okanagan Lake, our human health, and our environment through efficient collection and effective treatment of wastewater.**
- **Stormwater is effectively managed without negatively impacting riparian areas, infrastructure, property, or Okanagan Lake.**
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- ***syilx* knowledge, practice and permitting is effectively incorporated into water decision processes.**
- **The City works in partnership with other water providers and government agencies to ensure water security.**

3.0 FOUNDATIONAL ELEMENTS

3.1 GOVERNANCE

The City of Kelowna shares water with many other users of Okanagan Lake and upland watersheds. To effectively manage the risks and responsibilities related to water security and responsibility, the City will need to align governance frameworks with other municipalities, *syilx* First Nations, industries, private landowners, the provincial government and the regional district.

Finding more ways to work together and align decision-making would enable more effective water security initiatives and provide better service to each community. One example of a common goal would be creating more resiliency to climate change impacts on water in the Okanagan.

A provincial audit of the City of Kelowna's water utility in 2018 showed that sustainable water management will only be possible through collaboration between the many governments and groups involved in the protection and management of water sources and systems in the region.

Guiding Principle

The City works in partnership with other water providers and government agencies to ensure water security.

Provincial legislation and requirements

The regulatory framework regarding water and watershed protection rests with the Province. The Province also delegates the City of Kelowna's legislative authority for specific activities within its jurisdiction. The City has stewardship obligations as part of its responsibility associated with the water it consumes and manages.

There are also various provincial ministries that are responsible for different pieces of legislation related to water security. Creating more collaboration with these ministries to achieve the requirements set out for the City and other municipalities could create more efficient and effective practices for all partners.

This Water Security Plan addresses the City's responsibilities and requirements laid out in multiple pieces of legislation and bridges the gap between provincial watershed protection and health and safety requirements.

The City operates the McCulloch Reservoir system outside of the City Boundary, which means that rural regulatory processes and legislations apply.

How are we doing?

The following outlines the strengths, challenges and opportunities as they relate to water governance in the City of Kelowna:

STRENGTHS

Previous successful partnerships

- The partnership with the Province, Okanagan Nation Alliance, Westbank First Nation, RDCO and others led to the successful Mission Creek Restoration Initiative.
- Flood protection funding and assistance was accessed from senior governments to support recovery after flooding in 2017 and 2018.
- The successful integration of SEKID into the City's water utility helped save costs and better serve residents.

CHALLENGES

Jurisdictional role

- The City has few resources and little jurisdiction outside of its boundary. Activities or investments in the upper watershed, outside of the City's jurisdiction, could be either detrimental or beneficial to water security.

Varying interests and needs

- The various agencies involved in water responsibility have different interests, needs and funding requirements.

OPPORTUNITIES

Shared interests

- The City of Kelowna and other local governments and water providers have similar challenges and goals, which could be addressed more effectively by working together.
- This plan, which was developed through a workshop with many of the City's partners in water management, reflects a collaborative process for long-term planning.

How will we improve?

These specific actions support improvements in how the City aligns governance with other partners. A summary of all water security actions and how they relate to the guiding principles is included in **Appendix A**.

SHORT-TERM

- Align City operations, level of service, and key performance indicators with the guiding principles of the Water Security Plan.
- Develop communications strategies to support service levels.

MEDIUM-TERM

- Prepare risk registries and contingency plans for water security infrastructure assets.

LONG-TERM

- Assess and refine development policies and processes to incorporate requirements to include source water protection, natural system preservation, and prevention of development on floodplains.
- Update and align infrastructure master plans with an assessment of risks (likelihood and consequence) facing service delivery including asset condition, capacity, compliance and undertaking a climate vulnerability assessment for the water systems.

3.2 PARTNERSHIPS

Water security in and around Kelowna is a shared responsibility, which requires collaboration, input and support from a variety of partners. This includes local First Nations, the provincial government, neighbouring municipalities and the regional district, other water providers and key organizations, such as Interior Health and the Okanagan Basin Water Board.

Each of these partners have their own interests, regulations and requirements surrounding the management, protection and supply of water services in their communities. This Plan emphasizes the need to work together to define priorities and implement solutions for the challenges we all face related to water responsibility.

Guiding Principle

The City works in partnership with other water providers and government agencies to ensure water security.

LOCAL FIRST NATIONS

Local First Nations have inherent rights and responsibilities for the water on their traditional, ancestral and unceded territory. Traditional knowledge and values must be incorporated into water management practices to reflect the deep knowledge these communities have of this area. Specifically, ongoing collaboration is needed with:

- Westbank First Nation, which owns and operates water systems that also rely on Okanagan Lake.
- Okanagan Indian Band, which is in the process of developing a partnership with the City of Kelowna to provide water and sewer service to residents of Indian Reserve 7 .
- Okanagan Nation Alliance, whose biologists and knowledge-keepers have initiated water studies, measurements, and are helping develop processes leading to positive change in fish habitat restoration, creak naturalization and water quality.

CITY OF KELOWNA

There are multiple departments within the City of Kelowna that play a role in water management and water responsibility. Internal coordination and alignment will be required to implement the actions outlined in this Plan. This includes utility services, infrastructure engineering, and development planning.

PROVINCIAL GOVERNMENT

The provincial government plays a significant role in water management. This includes responsibility for water and land use regulations, health requirements, and empowering and funding other agencies that support sustainable management practices and infrastructure. The provincial regulatory framework for water management is complex, and overlaps several ministries and agencies, including:

- Ministry of Housing and Municipal Affairs
- Ministry of Health
- Ministry of Water, Land and Resource Stewardship
- Ministry of Forests
- Ministry of Agriculture and Food

The Interior Health Authority establishes requirements for drinking water providers to protect public health, and approves, inspects and monitors water systems to prevent the spread of water-borne diseases.

NEIGHBOURING MUNICIPALITIES AND REGIONAL DISTRICTS

Other local governments provide services in their communities that have an impact on the City of Kelowna's water security practices, and vice versa. This includes the Regional District of Central Okanagan, the District of Lake Country, the City of West Kelowna and District of Peachland as well as other communities within the Okanagan basin.

PARTNER ORGANIZATIONS

The Okanagan Basin Water Board works to identify and resolve critical water issues in the Okanagan watershed, and includes representatives from the three Okanagan regional districts, the Okanagan Nation Alliance, the Water Supply Association of BC and the Okanagan Water Stewardship Council.

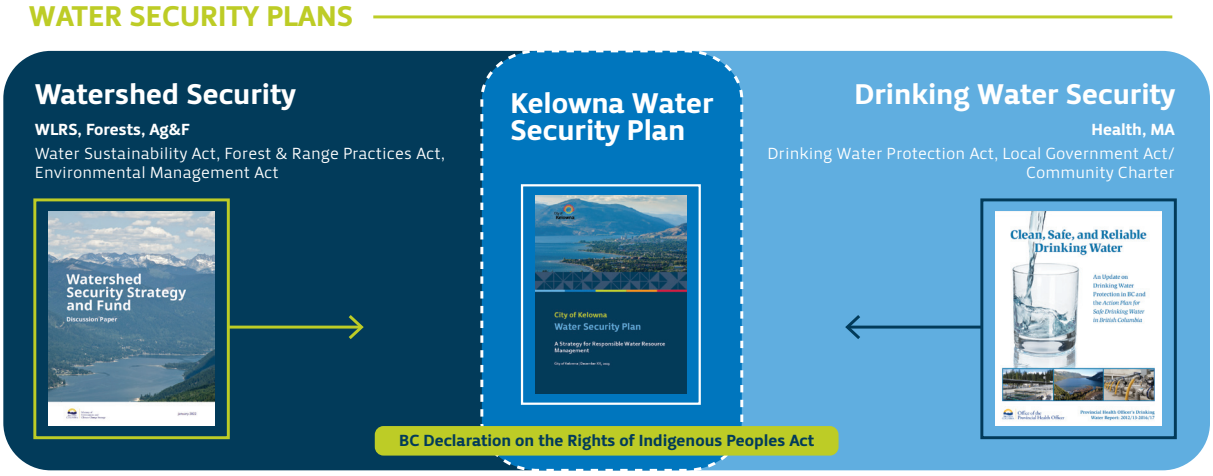
There are three large water purveyors that provide water to residents in Kelowna:

- City of **Kelowna Water Utility**, which, with the amalgamation of the Glenmore-Ellison Improvement District (GEID) on January 1st, 2025, serves three quarters of the population of Kelowna, amounting to approximately 120,000 residents.
- **Black Mountain Irrigation District (BMID)**, which serves approximately 26,000 people in the Scotty Creek subdivision and the Belgo, McKenzie, Ellison, and Black Mountain areas of Kelowna.
- **Rutland Waterworks District**, which serves over 13,000 residents in the Rutland area.

What are we doing to develop partnerships, today?

There are several policies, plans and frameworks that outline the priorities for the many different users, organizations and governments responsible for water security in the region. These provide a starting point to align work between partners and establish shared goals for water security, and serve as examples of how future partnerships could be achieved:

- City of Kelowna 2040 Official Community Plan, which lays out policies to ensure creeks and lakes have the necessary flow and temperature to support a thriving and resilient aquatic habitat.
- Mission Creek Water Use Plan, which was jointly developed and endorsed by the City of Kelowna, the Province and Black Mountain Irrigation District.
- Water Responsibility Strategy and Fund, which is under development by the Ministry of Water, Land and Resource Stewardship to support better stewardship of watersheds across the province.
- *Clean, Safe, Reliable Drinking Water,* a report from the Ministry of Health that provides recommendations to prevent and reduce the risk of contamination of drinking water.



Additional examples of successful initiatives and partnerships that have supported better service for the community and the health of aquatic environments include:

- Merging the Glenmore-Ellison Improvement District (GEID) with the City water utility as initiated by the GEID Board of Trustees to help ensure reliable, resilient and sustainable water supply to the Glenmore-Ellison area.
- Merging the Southeast Kelowna Irrigation District (SEKID) with the City water utility, which was supported with funding from the provincial and federal governments. This helped provide safe, clean drinking water to the SEKID customers, who previously experienced regular drinking water quality advisories, and protected the SEKID water source for agricultural use.

The Mission Creek Greenway is an example of a successful partnership between multiple jurisdictions that promotes sustainability and public awareness.

The City's Raymer Wastewater Treatment Plant plant must continue to maintain its effectiveness in treating effluent. Senior government partnerships will be needed to support future growth.

How will we improve?

These specific actions support improvements in how the City works with key partners in water management. A summary of all water security actions and how they relate to the guiding principles is included in **Appendix A**.

SHORT-TERM

- Establish regular meetings with other water purveyors in Kelowna to collaborate on water supply challenges and share expertise in urban and rural water supply needs.
- In partnership with other organizations, increase our measurement and publishing of water data in the Okanagan basin.

LONG-TERM

- Develop Best management practices with other Okanagan agencies and the Okanagan Basin Water Board for water related operations and maintenance.
- Seek financial support from higher levels of government for continued water security initiatives.

> **"The siwɬkʷ, tmxw ulaxw , and all living things are all intricately connected, what you do to one you do to all."**
>
> ***syilx* Water Declaration**

3.3 *syilx* KNOWLEDGE

The City of Kelowna is located on the traditional, ancestral, unceded territory of the *syilx*/ Okanagan people, and has benefited from the use of the water and land that *syilx* Peoples have the inherent rights and responsibilities to care for.

The Okanagan Indian Band and Westbank First Nation are both part of the *syilx* Nation, a transboundary Nation that extends across multiple watersheds and the Canada-U.S. border. The *syilx* Nation comprises of seven communities on the Canadian side and a confederated tribe south of the 49th parallel. The Okanagan Nation Alliance (ONA), an alliance of the individuated Bands within the *syilx* Nation, advocates for member Nations and pursues collective initiatives across the territory.

The Okanagan Nation Water Declaration (2014), states siwɬkʷ, or water, is not a resource or a commodity. Instead, siwɬkʷ "has the right to be recognized as a familial entity, a relation, and a being with a spirit who provides life for all living things."

Guiding Principle

syilx knowledge, practice and permitting is effectively incorporated into water decision processes.

> **"siwɬkʷ is our most sacred medicine: siwɬkʷ nourishes, replenishes, cleanses, and heals. Any use of siwɬkʷ should be an act of reverence and a commitment to our responsibilities to all life: now and to come, as *syilx* People".[1]**
>
> ***syilx* Water Declaration**

Excerpts from:
1. *syilx* Nation siwɬkʷ Declaration. 2014. Principle 5. Published by the Okanagan Nation Alliance

The Okanagan Nation Water Declaration reminds us that our lakes, rivers, creeks, streams and oceans are all connected – to each other and to us – and thus that all people share the responsibility to care for and preserve water for our future generations. A central priority of the *syilx* Nation is to protect and restore siw̓k̓ʷ[2]. In recognition of this, the City emphasizes the need to establish environmental flow needs, creek flow measurement, fish spawning opportunities, and flood mitigation parameters.

PROVINCIAL COMMITMENTS

The Province continues its mandate to bring provincial laws into alignment with the *United Nations Declaration on the Rights of Indigenous Peoples* and develop and implement an action plan to achieve these objectives in consultation and cooperation with Indigenous Peoples. The Ministry of Water, Land and Resource Stewardship, for example, continues to co-develop a Watershed Security Strategy and Fund.

CITY RESPONSIBILITIES

The City of Kelowna has the authority to establish policies to guide the growth, development and operation of the City. Kelowna is now looking to address some anticipated gaps in our processes that will be caused by upcoming changes in legislation, regulation and legal priority. This process includes our responsibilities with water. In the meantime, City staff participate in a wide variety of local efforts, including the ONA's Okanagan Lake Responsibility Planning Initiative Workshops, interactive field tours on *syilx* Knowledge, and incorporating *syilx* knowledge into project design criteria. The City is working to maintain and strengthen a respectful and collaborative relationship with the Okanagan Nation Alliance and to pursue partnerships and agreements with Okanagan Indian Band to provide water and sewer servicing to Indian Reserve 7 at the north edge of Kelowna.

How will we improve?

These specific actions support improvements in how the City incorporates *syilx* knowledge into water management practices. A summary of all water security actions and how they relate to the guiding principles is included in **Appendix A**.

SHORT-TERM

- Consistently participate in *syilx* water resource activities in the Okanagan.

MEDIUM-TERM

- Ensure best management practices and environmental stewardship policies incorporate *syilx* values related to water and fish through participating in ONA water-centric and educational opportunities.

2. *syilx* siw̓k̓ʷ Strategy. 2021. Page 26. Priority 3. Published by the Okanagan Nation Alliance.

4.0 KEY WATER SECTORS

4.1 WATER SUPPLY

What does water supply mean?

Water supply refers to the system that ensures we have water to use in our homes, at workplaces, for agriculture and in public spaces and amenities. In Kelowna, water is suppled by several providers from a few different sources, including Okanagan Lake, upland reservoirs, creeks and groundwater.

Why is water supply important for water security?

Water is critical for both life and our economy. Supplying safe and reliable water is one of the most important roles for a local government.

In Kelowna, we live in a semi-arid environment where the water is in limited in supply. We share the our water sources with other users, wildlife and the natural environment. By taking steps to ensure reliable, sustainable water supply, Kelowna citizens will continue to receive high-quality, affordable water.

As we face climate change, natural disasters, and population growth, we need to build a resilient water supply that leverages effective infrastructure, natural and built systems, and public involvement.

Guiding Principle

All residents and water users in the City have a safe, affordable, resilient and sustainable supply of high-quality drinking water and a reliable supply of water for agriculture.

What are we doing to manage water supply, today?

Kelowna citizens are supplied water from several water sources including Okanagan Lake, upland reservoirs, creeks and groundwater. Since the City boundary was extended in 1973, City residents and customers are also supplied by several water purveyors, private water systems, private wells and private licensees.

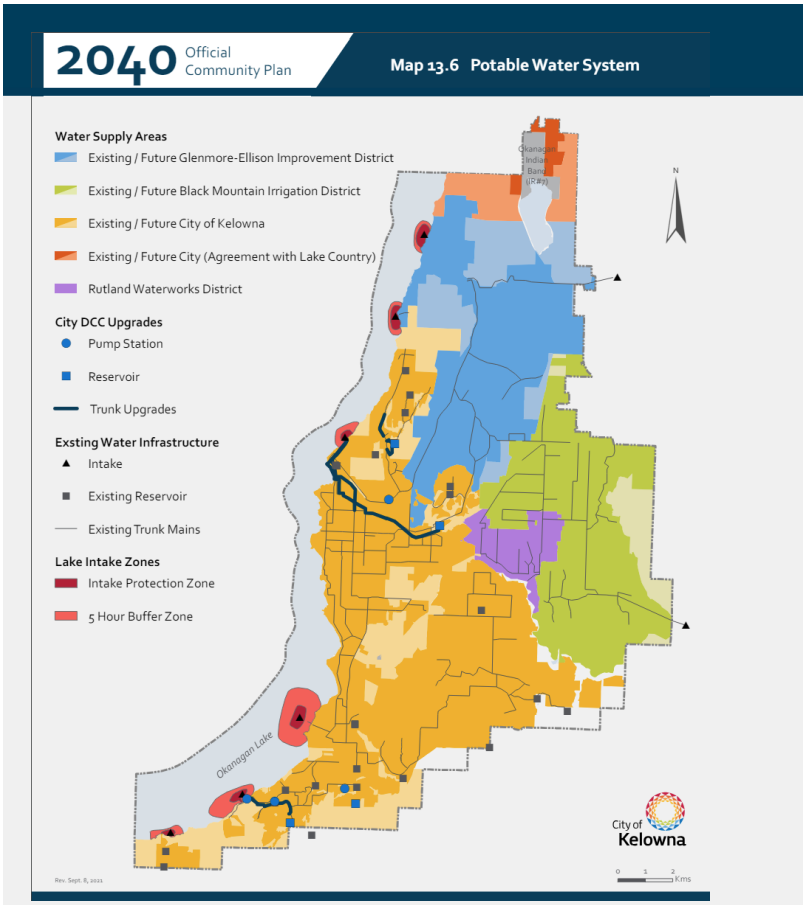
As of January 1, 2025, Kelowna's water utility (shown in orange and blue on the map below) supplies potable water to three quarters of the community from Okanagan Lake. Independent water purveyors and other community suppliers, which all operate under the authority of the provincial government, also source water from Okanagan Lake, groundwater and creeks that are all part of the Okanagan watershed.

The quality of the water supplied by the City and other purveyors needs to meet public health standards and the standard necessary for sustainable food security and agricultural supply.

Demand for home irrigation has a major impact on the capacity needs for water supply infrastructure. Summer demand is three times larger than winter demand.

Potable water is pumped from Okanagan Lake. This booster pump system at Stellar Road moves water to higher destinations in the City.

Reservoirs, such as this one on Jean Road, allows water pressures to be stable, provide resiliency to the areas served, and provide emergency water supply for firefighting.



On January 1, 2025, the Glenmore-Ellison Improvement District, shown in blue, amalgamated with the City of Kelowna water utility.

How are we doing?

The following outlines the strengths, challenges and opportunities as they relate to water supply in the City of Kelowna:

STRENGTHS

High-quality service

- Major water providers all use a multi-barrier approach for water treatment, which is a best management practice in British Columbia.
- The City utility meets the storage and supply demands for agricultural customers in the City service area.
- All major water providers meet all current demand from customers.

Pro-active protection

- The City uses a proactive approach to protect water intakes through intake protection zones.

CHALLENGES

Reducing water use:

- Based on community engagement, City of Kelowna residents appear supportive of reducing water use. Suggestions for how the City could encourage water conservation include restrictions or incentives to become more efficient in non-essential and water-intensive activities such as residential pools, water features, golf courses and excessive watering, or encouraging water-efficient landscaping (such as Xeriscaping).
- Water rates are among the lowest in Canada, resulting in inefficient behaviors around usage.

Growth and development

- The pace of development and population growth in the City will put more pressure on water supply. Long-term planning should prioritize ensuring the security of the City's water supply.

Alignment and accountability

- The City is not well aligned with the planning needs of other purveyors in Kelowna.
- Ownership and accountability of water systems is fragmented. Each water purveyor or system is only accountable to their Council, Board or Provincial Ministry.

High infrastructure costs

- Residents face increasing costs to deliver water-related services.
- The City utility continues to defer construction of water filtration plants for each of the Okanagan Lake intakes. However, this deferral depends on Okanagan Lake remaining a high-quality water source that does not yet require filtration to meet Interior Health requirements.
- The installation and renewal of water supply infrastructure is costly, and the costs for replacement are rising faster than inflation.

Resiliency of supply

- Customers of both urban and rural suppliers are at risk of water shortage should a major system failure occur. The City's major water systems are poorly interconnected, and a similar failure to that in Calgary in 2024 could happen here. The City must address communication gaps between its water purveyors and develop resiliency of supply across the City.

Access to new water sources is limited.

- Threats exist to Okanagan Lake water quality due to climate change, changing input from creeks and precipitation, invasive species such as zebra and quagga mussels, and increased recreational use.

Limited capacity

- The City infrastructure will require significant capacity upgrades to service accelerated growth needs.
- Agriculture has limited capacity to expand without an adequate water supply.

OPPORTUNITIES

Knowledge sharing

- The City has a strong understanding of urban vs. agricultural water needs, and can play a role in collaborating with purveyors to manage supply in the local watershed.

How will we improve?

These specific actions support improvements in water supply. A summary of all water security actions and how they relate to the guiding principles is included in **Appendix A**.

SHORT-TERM

- Conserve water. Update water demand criteria in Bylaw 7900 updating infill zoning and new light industrial requirements.
- Review and upgrade water infrastructure in urban core areas to assure that water supply is adequate to meet firefighting requirements to facilitate densification.
- Increase our measurement of water use and focus on evidence-based decision making by aligning water consumption data with irrigation use.
- Advise government and the agricultural community of the commitment required to renew and replace aging supply and delivery infrastructure.

MEDIUM-TERM

- Develop funding strategies that assure that non-potable water is supplied to the agricultural community.
- Assure resiliency and water quality supply risk mitigation through interconnectivity of sources.
    - Evaluate transmission connectivity between McKinley intake and Dilworth Reservoir.
    - Install multiple connections between GEID and City system to interconnect the networks.

LONG-TERM

- Protect public health by developing concept plans and ensuring land is available for addition of filtration facilities at all potable water supply locations.

4.2 WASTEWATER MANAGEMENT

What is wastewater management?

Wastewater management refers to how sewage and wastewater from homes and businesses in Kelowna is treated and discharged. In Kelowna, treated wastewater, or effluent, is discharged into Okanagan Lake. This effluent needs to be clear of any nutrients, toxins, metals or other contaminants that could affect the water quality of the lake.

Why is wastewater management important for water security?

Wastewater management is crucial for the health and safety of our community. Since we source some of our domestic water supply from Okanagan Lake, the lake water needs to be clean and reliable. Wastewater treatment is a critical process at the City of Kelowna because of the potential health and safety consequences for our drinking water.

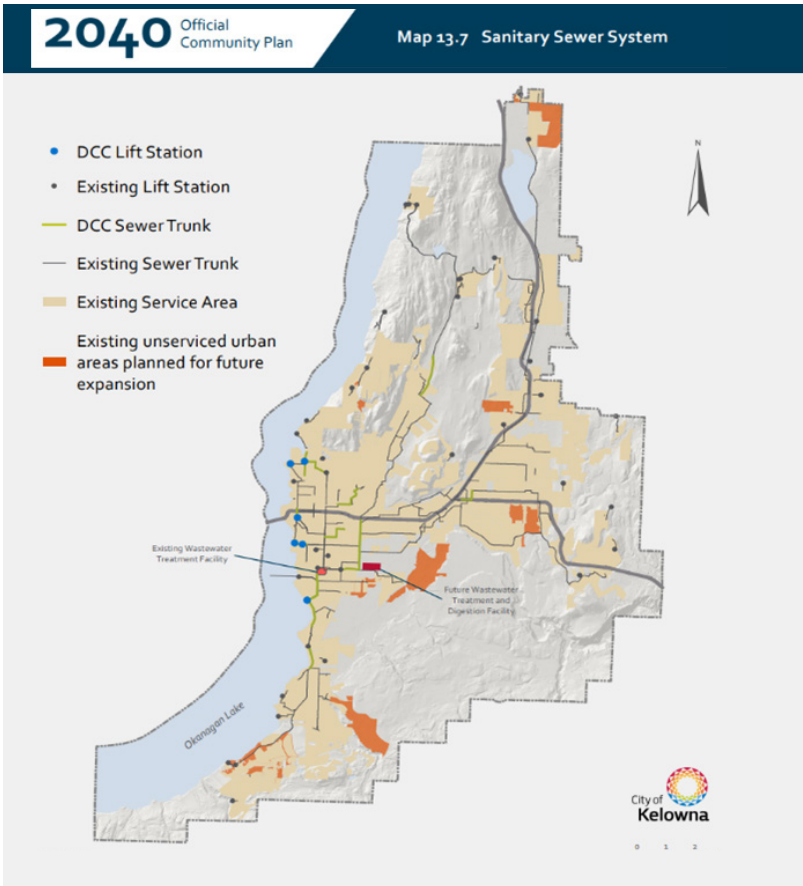
Guiding Principle

Protect Okanagan Lake, human health and our environment through efficient collection and effective treatment and disposal of wastewater.

The City operates 44 lift stations, which transfer wastewater from a lower level to a higher level to transport it to the wastewater treatment plant.

What are we doing to manage wastewater, today?

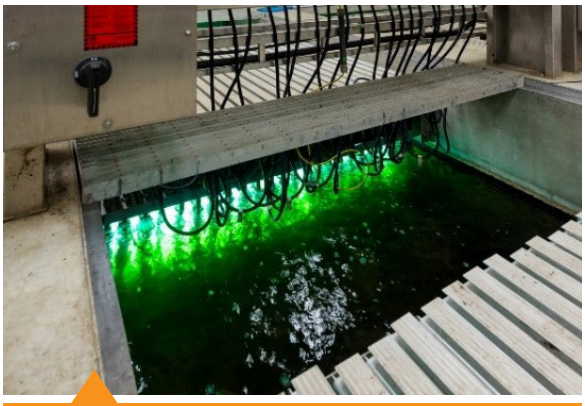
Almost all of Kelowna's urbanized areas are connected to the sanitary sewer service. Some wastewater from industrial or agricultural uses are pre-treated before entering the sanitary sewer system and are monitored regularly to assure that normal treatment processes are not impacted.



Kelowna has been a leader in wastewater treatment advancement for decades and piloted a bio-nutrient treatment process with the University of British Columbia (UBC) as far back as the 1980s. The City's treatment plant has undergone several upgrades since then to optimize this technology and grow the plant's capacity to accommodate community growth. Additional property has been secured to support expansion and redundancy of wastewater treatment in the City.

Thanks to Kelowna's wastewater management system, it's safe to discharge the treated effluent into the lake. The effluent is also discharged at specific locations and water depths to ensure it isn't near water supply intakes. The quality of the treated wastewater is monitored regularly and compared to the provincial permit measures to ensure Okanagan Lake continues to be a safe, healthy, reliable source of water.

Before filtering and UV disinfection, wastewater goes through primary and secondary clarification, which removes solid waste and nutrients.



Before treated effluent is discharged back to Okanagan Lake it undergoes a final disinfection process with ultraviolet light.

Key objectives for the City of Kelowna's wastewater management system include:

- Collect wastewater from all urbanized areas of the City and route it safely to the wastewater treatment facility.
- Effectively filter, treat and disinfect all wastewater to protect public health, the environment and Okanagan Lake.
- Assure that policies are consistent across the valley to prevent discharge of untreated sanitary wastewater to Okanagan Lake.
- Sustain investment, resources and trained professional staff to service the needs of a growing city reliably for 24 hours a day and 365 days per year.
- Rates that reflect these objectives, a reasonable level of service, and are competitive with other communities.

How are we doing?

The following outlines the strengths, challenges and opportunities as they relate to waste water management in the City of Kelowna:

STRENGTHS

Service capacity

- The City currently collects wastewater from 95% of the population in Kelowna.
- We are succeeding in consistent treatment of trade waste, or waste that's created by food or industrial businesses, through our Brandt's Creek wastewater plant.

Water treatment requirements

- The City of Kelowna's wastewater treatment process effectively removes or reduces nutrients, toxins, soaps and other sanitary elements from being introduced to Okanagan Lake.
- Kelowna consistently meets or exceeds permit requirements and legislated levels for treated effluent. The treatment processes for areas on sewer collection are highly effective.

CHALLENGES

Treatment Challenges

- The City's success in reducing water demand is leading to a higher concentration of sanitary inflows to the wastewater treatment process. This is causing a need to expand capacity and increase funding earlier than expected.
- Urban development adjacent to the treatment plant adds to operating challenges.

Septic systems

- On-site septic systems are used in rural or less urban areas of the City. The failure of these systems, especially those close to a creek or other body of water, is a risk to water quality.

Using biosolids

- We have a growing biosolids production that can be a challenge to manage. Biosolids include sludge and filtered materials that are byproducts of the wastewater process. Sustainable biosolids management includes composting, reducing volumes through anaerobic digestion, or shipping to external sites for mine reclamation.

Infrastructure costs

- Wastewater transmission and treatment infrastructure are expensive to construct and maintain.

Illegal dumping

- Illegal discharges into system have the potential of shocking the biological treatment processes the City uses. Public awareness of this issue is low.

Multi-jurisdictional impacts

- Not all communities that discharge effluent into Okanagan Lake treat wastewater at the same level.

OPPORTUNITIES

Updated Sewer Connection Program

- The City has recently updated its sanitary sewer connection program in an effort to connect remaining urbanized areas to sewer. This is an ongoing process, which is estimated to take at least 20 more years.

Valuable Biosolids

- The treatment system produces Class A compost using the removed biosolids, which can be used by the community as a soil amendment.

Heat Capture

- We are capturing some surplus process heat in wastewater and converting it to building heat at Okanagan College. There is the potential to recover even more heat through this process.

How will we improve?

These specific actions support improvements in wastewater management. A summary of all water security actions and how they relate to the guiding principles is included in **Appendix A**.

SHORT-TERM

- Develop and implement improvements to wastewater treatment facility to address challenges related to increasing concentration of influent.

MEDIUM-TERM

- Work with Interior Health to add tracking of emerging contaminants of concern that are under the City's scope of responsibility.

LONG-TERM

- Plan for an alternate treatment plant site to be included in the development of new processes and capacity improvements.
- Transition on-site septic systems to community sewer in urbanized areas. Complete the transition program by 2040.

4.3 ENVIRONMENTAL FLOW NEEDS

What are environmental flow needs?

Fish, wildlife, ecosystems and all natural systems require water to function. Environmental Flow Needs (EFNs) define the ideal volume, timing and quality of water flow needed to keep an aquatic ecosystem healthy and sustainable.

Why are environmental flow needs important for water security?

EFNs are important for water security because they support the survival of fish, wildlife and other natural systems.

In the Okanagan, EFNs are particularly crucial for species like Kokanee salmon, which require cooler water temperatures when they travel upstream to spawn. The minimum environmental flows needed to support fish are at risk in late summer and early fall due to hot weather, low precipitation and high demand for water in agriculture, residential and recreational uses.

The Water Sustainability Act (WSA) requires provincial decision-makers to consider EFNs in new water source license applications, which allow local governments and land owners to divert, use or store surface water or ground water.

Guiding Principle

Assure that the quality and quantity of water is available to support a healthy aquatic system.

New water license allocations from streams and connected aquifers are unlikely to be granted if the EFNs cannot be met.

"Critical Flow Needs" is another term used when the water flow levels are at extreme low levels because of extreme heat, drought or over use. This term identifies the flows needed for fish and wildlife to survive in high temperatures. Additional regulations within the WSA and federal fisheries acts can use whatever means necessary to supplement emergency flows, which can impact water supply for residential, agricultural and business use.

The Okanagan Nation Alliance (ONA) has developed some EFN measures in many of the creeks feeding the Okanagan Lake and river watershed. These measures will likely become regulatory conditions and will form the basis of water demand criteria for the Province into the future.

What are we doing to manage environmental flow needs, today?

Policies and regulations

The City of Kelowna 2040 Official Community Plan includes policies to ensure that creeks and lakes remain at the temperatures and flow levels needed to support thriving and resilient aquatic habitats.

The City's primary responsibility is currently to ensure that minimum flows are achieved in Hydraulic Creek supported by flows from McCulloch Lake. The flow from the lake is measured at the intake structure downstream from the release point. The 2010 Mission Creek Water Management Plan includes requirements for supplemental flows from reservoirs owned by the City, BMID and the province to support the Mission Creek flows to meet EFNs. These supplemental flows are needed on a regular basis.

During drought or dry conditions, provincial regulators focus on critical environmental flow threshold (CEFT) rather than EFNs. The CEFT establishes the minimum flows required to ensure the survival of fish populations. This measure provides regulators the ability to issue "fish population protection" orders which creates the power to release water from upland water storage in case of emergencies and prioritize creek flows over other uses.

Salmon spawn in pairs in local creeks and along the shores of Okanagan Lake. The female releases her eggs at the spawning location for the male to fertilize. The eggs are laid in gravel nests called "redds." Salmon fry hatch and emerge from the redds the following spring.

Recent Mill Creek Flood Protection works incorporate fish passage, riparian improvements and fish spawning, similar to the habitat restoration work shown here on Mission Creek. These elements are now part of the design criteria for all future creek works.

Minimum water levels must be maintained in creeks in Kelowna to assure water temperature targets are met.

Fish reintroduction

The ONA is working with communities to re-introduce Sockeye and Chinook salmon into the Okanagan Valley. The shoreline of Okanagan Lake and the creeks that feed into the lake provide crucial salmon spawning habitat. As part of the Mill Creek Flood Protection Project, the ONA produced a Mill Creek Habitat Assessment and Restoration Plan for the creek from the Kelowna International Airport to Okanagan Lake. The report identifies the ability of each section of the creek to support fish spawning and recommends restoration activities to improve spawning conditions.

How are we doing?

The following outlines the strengths, challenges and opportunities as they relate to Environmental Flow Needs in the City of Kelowna:

STRENGTHS

Ongoing fish reintroduction

- Since 2016, the Okanagan Nation Alliance has released Sockeye salmon fry into Mission Creek to restore salmon to their natural habitat. Four years later, these salmon should return to the release point and spawn. Fish counts are undertaken to track success.
- Multiple restoration projects have been recently completed to enhance habitat resulting in increased salmon spawning in Kelowna creeks.

CHALLENGES

Climate change

- Climate change is impacting natural flows and making predictive watershed planning more difficult.

Measurement and reporting

- New water supply licensing will require a working knowledge and reporting of Environmental Flow Needs.
- Fish kills or riparian zone destruction in any water management facility can result in heavy fines and reputational damage.

Coordination between partners and plans

- Several governing entities, purveyors, industries and recreation play a part in water management in watersheds—however, there is a lack of coordination between them and the City does not have a good understanding of how upstream creek watersheds are being managed.
- The City's drought management or water shortage plan procedures do not address critical flow needs.

Regulatory changes

- Upper watershed supply is at risk of impacts from regulatory changes.

OPPORTUNITIES

Mill Creek improvements

- Improvements are being achieved in recent flood mitigation work on Mill Creek, creating the potential to release new salmon fry in the future.

How will we improve?

These specific actions support improvements in environmental flow needs. A summary of all water security actions and how they relate to the guiding principles is included in **Appendix A**.

SHORT-TERM

- Incorporate critical flow needs into the City's drought management and water shortage plans.
- Investigate modifications to storage infrastructure to optimize release to minimize losses and ensure environmental flow needs are met.

MEDIUM-TERM

- Work with the Province and partners to plan reservoir storage in the upper watersheds and improve management of critical flow releases to our creeks, reducing impacts to allotments for the agricultural industry.

4.4 STORMWATER MANAGEMENT & FLOOD PROTECTION

What is stormwater management and flood protection?

Stormwater management and flood protection refers to how the City of Kelowna controls runoff from rainwater or melted snow to prevent flood damage and impact on Okanagan Lake water quality.

Why is stormwater management and flood protection important for water security?

Kelowna is located in a semi-arid valley and gets rain less frequently than other parts of British Columbia, our stormwater management needs are much different than other cities. We need a unique approach that addresses how stormwater and flooding affects the city and the water quality of Okanagan Lake, our primary water source.

Since we live in a dry climate, pollutants tend to accumulate on roads, ditches and other spaces. When rainstorms happen, pollutants and sediment travel through the drains, sewers and creeks, negatively impacting the health of our ecosystem.

Guiding Principles

Stormwater is effectively managed without negatively impacting riparian areas, property or Okanagan Lake.

The community is resilient and resistant to lake and creek flooding.

Stormwater also causes flooding, accelerating flows that increase the risk of erosion and sediment deposition in our creeks.

Severe events have closed beaches, flooded businesses and caused drinking water quality advisories. Our creeks must have the capacity to handle local storm events. The City is looking at every opportunity to increase the creek width and using the riparian areas to contain flood events. This has the added benefits of improving water quality, increasing fish spawning capabilities, and providing the needed protection with effective tree cover.

MINOR SYSTEMS

- Buried sewers
- Manholes
- Curb
- Gutters
- Soak-away strips
- On-site storage structures

MAJOR SYSTEMS

- Channels
- Roads
- Storm ponds
- Outfalls

NATURAL SYSTEMS

- Streams
- Gullies
- Pond
- Wetlands
- Okanagan Lake

What are we doing to manage stormwater, today?

The City's key objectives for managing stormwater effectively include:

- Safely routing rain and snow to natural systems
- Improving the quality of water entering Okanagan Lake and its contributing creeks, ponds and channels
- Protecting people, property, key infrastructure and the environment from flooding
- Sustainably investing in stormwater asset renewal and operating budgets
- Ensure the stormwater and flood protection sector is funded for the expected level of service

Stormwater capacity

The City of Kelowna manages stormwater by routing runoff through minor, major and natural systems:

- *Minor systems* typically accommodate 1-in-5-year storms and include assets like buried sewers, manholes, curbs, gutters, soak-away strips and on-site storage structures. Minor systems convey flows toward major and natural systems.
- *Major systems* are designed to accommodate 1-in-100 or 1-in-200-year storm events. Examples include more specialized assets such as channels, roads, storm ponds, and outfalls. The goal of a major system is to protect land and property, prevent erosion and route stormwater to natural systems.
- *Natural systems* are typically the end point for stormwater to flow into, including streams, gullies, ponds, wetlands and Okanagan Lake.

Stormwater ponds are constructed to capture water, reduce downstream peak flows and improve the quality of water entering the creek or water body.

Data on stormwater is collected through automated rain gauges located throughout the City. There is over 30 years of historical data available.

Flood friendly road crossings are being installed on Mill Creek Road to allow fish passage and reduce debris blockages.

Stormwater quality

The history of our agricultural and urban land development practices has shaped our vibrant and beautiful City. However, our legacy stormwater systems present a challenge—many components were not designed with water quality in mind. Over time, we've shifted from managing local flooding and property damage to focusing on integrated stormwater management, protecting creeks, wetlands, and Okanagan Lake.

This challenge cannot be tackled by the City alone, as our community plays a crucial role in protecting our environment. By adopting responsible private maintenance solutions and ensuring stable funding, we can maintain treatment systems, protect riparian areas, and set high water quality expectations for fish, wetlands and Okanagan Lake for future generations.

How are we doing?

The following outlines the strengths, challenges and opportunities as they relate to stormwater management and flood protection in the City of Kelowna:

STRENGTHS

Infrastructure maintenance

- The City cleans out 20% of the oil-grit separators and over 90% of catchbasins, annually. These devices remove sediment from runoff prior to entering the creeks or Okanagan Lake.

Measurement and reporting

- The City is slowly improving its creek flow and quality measurement capabilities. Information dashboards that provide visual interpretation of instantaneous data are becoming more available.
- Flood Protection infrastructure:
  - The re-construction of the diversion on Mill Creek is resulting in lower instantaneous flood peaks downstream and improved staff safety.

CHALLENGES

Minimizing our City's impacts on creeks and Okanagan Lake

- Spot measurements for water quality on our creeks show there are pollutants entering our waterways.
- Water oxygen levels are threatened by poor stormwater quality, which has a negative impact on fish spawning and survival.
- 80% of the City's impervious areas are on private property, which the City has limited ability to manage, and where water quality degradation often begins.
- Many historical stormwater management components do not consider water quality impacts.

Increasing risk of flooding

- The cause of higher flood peaks seen on Mill Creek are from a combination of climate change and a reduction in flood attenuation (or flooded lands) upstream.
- Flooding will continue to be a risk to many areas of the City.
- Larger snowpacks, high intensity rainfalls and increased risk of drought are challenging past engineering design standards.

Development on floodplains

- The options for flood mitigation and adaptation are constrained by existing development within the floodplains.

Storm pond maintenance

- Storm ponds and constructed areas can be declared naturalized, or considered natural habitat, making them difficult to maintain and operate.

OPPORTUNITIES

Flood Protection

- Substantial funding support from the province's Disaster Mitigation and Adaptation Fund is creating opportunities to improve flood resistance at Mill Creek.

Stormwater Quality

- Explore a utility-based funding model to allow a more stable approach to managing resources and incentivize effective stormwater management on private property.

How will we improve?

These specific actions support improvements in storm water management and flood protection. A summary of all water responsibility actions and how they relate to the guiding principles is included in **Appendix A**.

SHORT-TERM

- Establish guidelines for maintenance and operation of naturalized storm ponds and constructed areas.
- Update best management practices for the operation, maintenance, and renewal of storm infrastructure to protect the public, infrastructure, and the environment.
- Consider implementing a Stormwater Utility to incentivize effective stormwater quality and quantity management from private property.

MEDIUM-TERM

- Improve stormwater quality by conducting research on public stormwater ponds for nutrient management and habitat development to develop best management practices.
- Complete stormwater basin plans that include overland flow routes, safe discharge to natural systems, and account for future development.
- Update engineered solutions for urban development to reduce pollutants and fine sediment at the source.

LONG-TERM

- Ensure all flood protection designs include creek health, riparian health, and fish habitat goals.

4.5 NATURAL SYSTEMS

What are natural systems?

Natural water systems include lakes, creeks, wetlands, forests, soil and more. The City also manages "green infrastructure," which are enhanced and engineered to provide similar benefits to natural systems. Some examples of green infrastructure, which are often referred to as "natural" in urban settings, include stormwater ponds, rain gardens, parks, green roofs, rain barrels and more.

Guiding Principle

Account, protect, enhance and restore natural systems that make up our asset inventory and increase environmental recovery.

Natural Systems	Green Infrastructure	
	Enhanced	Engineered
• Lakes	• Stormwater ponds	• Permeable pavement
• Creeks	• Rain gardens	• Green roofs
• Wetlands	• Urban trees	• Rain barrels
• Forests	• Urban parks	• Green walls
• Soil	• Bioswales	
• Aquifers		

Why are natural systems important for water security?

Natural systems fill many key functions in water security, including preventing flooding, enabling stormwater to runoff safely, supporting healthy habitats for fish and wildlife, controlling temperatures, and naturally filtering and treating water. In many cases, the natural systems serve these needs more effectively than any artificial or engineered solutions. If the City of Kelowna doesn't protect the existing natural systems that support water security in the city, they can be difficult and costly to replace – and, sometimes, impossible to fully restore.

What are we doing to manage natural systems, today?

In the last five years, our approach to natural systems management has evolved significantly. This includes growing our understanding of what natural systems we rely on and how we can better protect them. In 2021, the City completed a natural asset inventory that describes the different natural systems in the city, their condition and the risks they face. In 2022, the City began a pilot project with the Natural Assets Initiative and the RDCO to examine how natural systems intersect with species at risk.

Additional projects and initiatives that have been undertaken to understand, project and restore natural systems include:

- Developing Natural Environment Development Permit Areas and Guidelines to protect environmentally sensitive and groundwater resources with high intrinsic value from the impact of development
- Developing a Wetland Habitat Management Strategy
- Updating the Sustainable Urban Forest Strategy
- Undertaking a variety of creek restoration projects, including some in partnership with other organizations
- Using a variety of GIS processes and models to inventory natural systems and green infrastructure including forest canopy coverage, creek and wetland mapping, flood mapping, and a sensitive ecosystem inventory

Many creeks in the city have been constrained to narrow channels, which are not as effective as they used to be in supporting wildlife habitat and preventing flooding.

Provincial forest regulations only apply outside the City's boundary. This is an example of how other jurisdiction's regulations and policies can impact natural systems within city boundaries.

City parks and trails are examples of "green infrastructure," which play a role in water security in addition to providing recreation to residents.

How are we doing?

The following outlines the strengths, challenges and opportunities as they relate to natural systems in the City of Kelowna:

STRENGTHS

Monitoring and measurement

- The City monitors some natural systems and forests.
- Natural systems within the City boundary are well documented.

Policies and criteria

- Protection of riparian areas and wildlife habitat has been emphasized in the OCP and recently drafted bylaws.
- New design criteria has been integrated into flood policies to include riparian flood protection.

CHALLENGES

Re-establishing riparian corridors

- Re-establishing riparian corridors is a requirement of creek enhancements and fish spawning opportunities.

Permitting

- It's becoming more common to need permits around lakes, streams and wetlands for all types of City activities, especially for City infrastructure projects.

Lack of control

- A variety of factors beyond the City's control can influence natural systems. For example, natural systems upstream of the city boundary can impact creek water quality and quantity flowing through the city. Recreation, forestry or agriculture within and outside of the city's boundary can also deteriorate natural systems, impacting water quality.

Climate change

- Climate change poses a significant risk to Kelowna's natural systems. Shifting intensity or timing of rainfall, thunderstorms, heat domes and snowfall are affecting forest health, fire activity and local waterways.

OPPORTUNITIES

Planning coordination

- Water security has not been incorporated into natural systems planning and monitoring before but could be added to strengthen the management of these systems.

Permitting

- The City should examine riparian banks as part of future a compensation structure that can include development and growth.

How will we improve?

These specific actions support improvements in natural systems. A summary of all water security actions and how they relate to the guiding principles is included in **Appendix A**.

SHORT-TERM

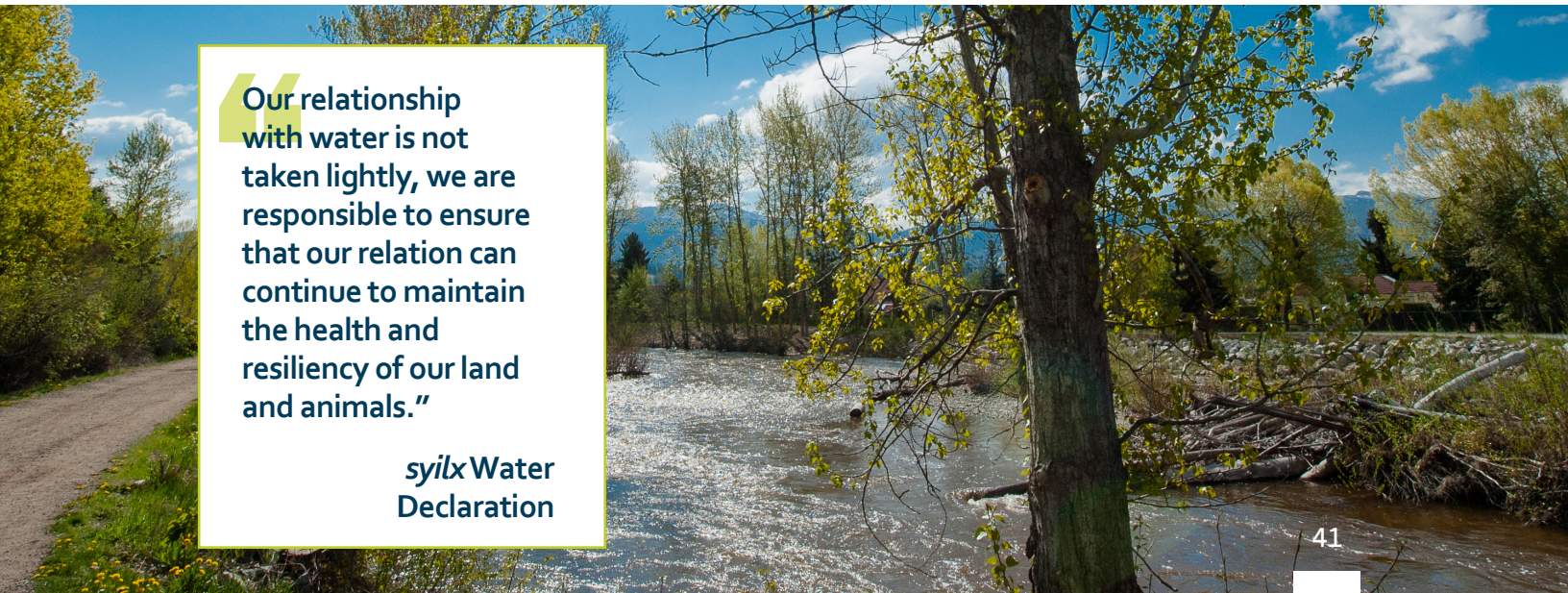
- Create a Habitat Compensation Bank for all environmental permitting requirements.

MEDIUM-TERM

- Complete a natural asset inventory by adding water responsibility considerations and incorporating the inventory into the City's Asset Management Program.
- Investigate possible zoning regulations to support the identification, protection and/or restoration of natural system protection areas.

LONG-TERM

- Restore creek riparian areas and reduce negative human impacts.



> **"Our relationship with water is not taken lightly, we are responsible to ensure that our relation can continue to maintain the health and resiliency of our land and animals."**
>
> ***syilx* Water Declaration**

4.6 SOURCEWATER PROTECTION

What is source water protection?

Source water is where the water we use comes from. In Kelowna, our water source is primarily Okanagan Lake. Protecting our source water is crucial to ensuring we have clean, safe and reliable drinking water.

Guiding Principle

Okanagan Lake and upland watersheds remain a source of high-quality water.

The quality of source water can be affected by various factors, such as:

- Land use practices that contribute to erosion, increasing runoff and changing natural drainage patterns
- Recreation and rangeland cattle waste
- Run-off from products used in agriculture
- Flooding/erosion of creeks that flow into Okanagan Lake
- Pollution from urban areas

Why is source water protection important for water security?

Source water protection is the first line of defense to ensure the provision of safe, clean drinking water. Without clean source water, the cost of treatment increases significantly. In the case of Okanagan Lake, the source water is of such high quality that Interior Health has granted the City of Kelowna a filtration exemption, saving significant costs for water users.

However, this filtration deferral depends on maintaining the water quality in the lake and can be revoked if quality falls below Interior Health requirements. Other conditions for maintaining this deferral include undertaking source protection measures and meeting the remaining objectives of the multi-barrier process to achieve safe drinking water.

Other Kelowna water providers also source water from other lakes, streams, springs and groundwater – all of which need additional protection. Groundwater sources are typically exempt from filtration requirements, but other surface sources usually need advanced treatment.

The consequences of not protecting our community's source water are significant. If the City of Kelowna lost the filtration exemption for the Okanagan Lake source, expensive water treatment upgrades and a complete refocus on infrastructure priorities would be required.

What are we doing to manage our water sources, today?

The City of Kelowna uses several strategies to manage and protect our water sources, including protecting intakes on Okanagan Lake, protecting local watersheds, and collaborating with regional partners:

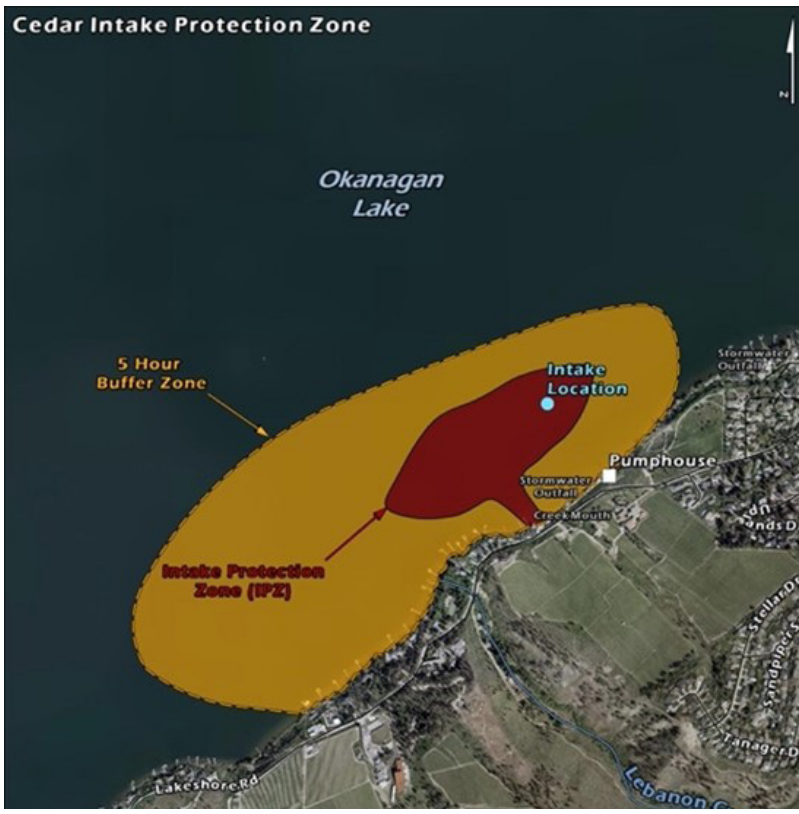
Creek water quality can impact Okanagan Lake source water quality.

Forestry practices impact source water through erosion, increased runoff and modifications to local drainage patterns.

Agricultural practices are key to reduce non-point source water pollution in our source water.

Intake protection:

The City of Kelowna water utility has protection zones around each of the four drinking water intakes on Okanagan Lake. These zones surround water intakes and define areas where special care must be taken to prevent potential contaminants from entering the lake.



Local watershed protection:

- The Black Mountain Irrigation District (BMID) sources their water primarily from Mission Creek. This source originates outside the city boundary but within the RDCO's jurisdiction.
- Rutland Waterworks sources all their water from groundwater within the City boundary. Source water protection features are geared more towards groundwater protection and management.

Regional protection:

Okanagan Lake, itself, is a source managed by other levels of government (First Nations, Province, Federal, and other local governments). The City participates with other communities on the Okanagan Basin Water Board (OBWB) and Water Stewardship Council

How are we doing?

The following outlines the strengths, challenges and opportunities as they relate to source water protection in the City of Kelowna:

STRENGTHS

High source water quality

- Okanagan Lake continues to be a high-quality source of drinking water.
- The City sees few water quality advisories annually.
- Four out of five lake intakes consistently meet turbidity limits year-round, which can impact proper disinfection. The one that doesn't always meet the guidelines is only used only during periods of low turbidity.
- The City water utility has a source water protection plan that identifies major impacts along with actionable items that is regularly updated as part of its water supply permit.

CHALLENGES

Coordination between lake users

- The City has minimal jurisdiction over land and water use in the Okanagan Lake watershed. Crown and private lands include commercial forestry, agriculture, range, mineral exploration, residential and recreational uses.
- There is little source water protection coordination, yet it is a responsibility to all users, including visitors and businesses that operate within the Okanagan Lake watershed.

Development and growth

- Development and population growth will continue to put pressure on the lake and its creeks. Growth and activity in turbidity-prone zones can permanently impact lake water quality.

Limited backup for water sources

- There are multiple intakes on a single lake supply, but no backup.

Maintaining filtration deferral

- To maintain the filtration deferral, the lake must remain healthy and of high quality. Lake water quality is diminishing over time.

OPPORTUNITIES

Collaboration with regional partners

- The City participates fully with the Okanagan Basin Water Board and its activities, creating opportunities for coordination of source water protection between jurisdictions.

Zebra and Quagga Mussels

- Through the OBWB, recreational boats are monitored continuously to prevent the entry of zebra and quagga mussels into Okanagan Lake.

How will we improve?

These specific actions support improvements in source water protection. A summary of all water security actions and how they relate to the guiding principles is included in **Appendix A**.

SHORT-TERM

- Develop policy for recreational development that minimizes impacts from watercraft, effluent discharges and other items impacting source water Protection Zones identified in the OCP.

MEDIUM-TERM

- Participate in development of a new Watershed Sustainability Plan for Mission Creek.
- Provide resources to manage issues within the Source Water Protection Portfolio. This staff can also participate at the Okanagan Basin Water Board.
- Provide resources to develop long term data analysis on water quality within Okanagan and upper watershed.

APPENDIX A

Action Matrix

ACTION MATRIX

GOVERNANCE

GUIDING PRINCIPLES: The City works in partnership with other water providers and government agencies to ensure water security

ACTION	RELATED FOCUS AREAS	TIME FRAME	KEY PERFORMANCE INDICATORS
Align City operations, level of service, and key performance indicators with the guiding principles of the Water Security Plan	Water Supply Wastewater Management Environmental Flow Needs Stormwater Management & Flood Protection Natural Systems Source Water Protection	Short-term	Level of Service for each sector is defined along with related KPIs that are published.
Develop communications strategies to support service levels	Water Supply Wastewater Management Environmental Flow Needs Stormwater Management & Flood Protection Natural Systems Source Water Protection	Short-term	Council and public communications and engagement consistently tie back to the water security plan.
Prepare risk registries and contingency plans for water security infrastructure assets	Water Supply Wastewater Management Environmental Flow Needs Stormwater Management & Flood Protection Natural Systems Source Water Protection	Medium-term	Risk registries and contingency plans are prepared for key infrastructure assets
Assess and refine development policies and processes to incorporate requirements to include source water protection, natural system preservation, and prevention of development on floodplains	Stormwater Management & Flood Protection Natural Systems Source Water Protection	Long-term	Number of units in flood zones
Update and align infrastructure master plans with an assessment of risks (likelihood and consequence) facing service delivery including asset condition, capacity, compliance and undertaking a climate vulnerability assessment for the water systems.	Water Supply Wastewater Management Environmental Flow Needs Stormwater Management & Flood Protection Natural Systems Source Water Protection	Long-term	Risk assessments are completed and incorporated into relevant infrastructure master plans

PARTNERSHIPS

GUIDING PRINCIPLES: The City works in partnership with other water providers and government agencies to ensure water security

ACTION	RELATED FOCUS AREAS	TIME FRAME	KEY PERFORMANCE INDICATORS
Establish regular meetings with other water purveyors in Kelowna to collaborate on water supply challenges and share expertise in urban and rural water supply needs	Water Supply	Short-term	Number and frequency of meetings held with water purveyors annually
In partnership with other organizations, increase our measurement and publishing of water data in the Okanagan basin.	Water Supply	Short-term	Number of new shared, published and publicly accessible water related data points sourced from other organizations
	Wastewater Management		
	Environmental Flow Needs		
	Stormwater Management & Flood Protection		
	Natural Systems		
	Source Water Protection		
Develop Best management practices with other Okanagan agencies and the Okanagan Basin Water Board for water related operations and maintenance.	Water Supply	Long-term	Best management practice developed for each sector Level of collaboration on service delivery practices between neighbouring local governments
	Wastewater Management		
	Environmental Flow Needs		
	Stormwater Management & Flood Protection		
	Natural Systems		
	Source Water Protection		
Seek financial support from higher levels of government for continued water security initiatives.	Water Supply	Long-term	Level of Provincial and Federal funding received.
	Wastewater Management		
	Environmental Flow Needs		
	Stormwater Management & Flood Protection		
	Natural Systems		
	Source Water Protection		

syilx KNOWLEDGE

GUIDING PRINCIPLES: *syilx* knowledge, practice and permitting is effectively incorporated into water decision processes.

ACTION	RELATED FOCUS AREAS	TIME FRAME	KEY PERFORMANCE INDICATORS
Consistently participate in *syilx* water resource activities in the Okanagan.	Environmental Flow Needs	Short-term	Number of activities that receive City support and participation.
	Natural Systems		
	Source Water Protection		
Ensure best management practices and environmental stewardship policies incorporate *syilx* values related to water and fish through participating in ONA water-centric events and educational opportunities.	Environmental Flow Needs	Medium-term	Best management practices incorporate and reference *syilx* values
	Natural Systems		
	Source Water Protection		

WATER SUPPLY

GUIDING PRINCIPLES: All residents and water users in the city have a safe, affordable, resilient and sustainable supply of high-quality drinking water and reliable supply of water for agriculture.

ACTION	RELATED FOCUS AREAS	TIME FRAME	KEY PERFORMANCE INDICATORS
Conserve water. Update water demand criteria in Bylaw 7900 updating infill zoning and new light industrial requirements.	Water Supply	Short-term	Per capita potable water production. Annual water produced divided by the population served.
Review and upgrade water infrastructure in urban core areas to assure that water supply is adequate to meet firefighting requirements to facilitate densification.	Water Supply	Short-term	All urban centre serviced properties meet minimum requirements of Policy 383 – Water Supply Level of Service.
Increase our measurement of water use and focus on evidence-based decision making by aligning water consumption data with irrigation use.	Water Supply	Short-term	Water meter data is incorporated into water utility planning processes.
Advise government and the agricultural community of the commitment required to renew and replace aging supply and delivery infrastructure.	Water Supply Partnerships	Short-term	Successful meetings with senior government.
Develop funding strategies that assure that non-potable water is supplied to the agricultural community.	Water Supply Partnerships	Medium-term	Funding strategy developed. Non-Potable systems are sustainably funded.
Assure resiliency and water quality supply risk mitigation through interconnectivity of sources. • Evaluate transmission connectivity between McKinley intake and Dilworth Reservoir. • Install multiple connections between GEID and City system to interconnect the networks.	Water Supply Source Water Protection	Medium-term	Percentage of customer properties serviced by two or more sources during emergencies. WQA-person-days and BWN Person days across city are falling or zero.
Protect public health by developing concept plans and ensuring land is available for addition of filtration facilities at all potable water supply locations.	Water Supply Source Water Protection	Long-term	Plans and land secured for advanced treatment at each source.

WASTEWATER MANAGEMENT

GUIDING PRINCIPLES: Protect Okanagan Lake, human health and our environment through efficient collection and effective treatment of wastewater.

ACTION	RELATED FOCUS AREAS	TIME FRAME	KEY PERFORMANCE INDICATORS
Develop and implement improvements to wastewater treatment facility to address challenges related to increasing concentration of influent.	Wastewater Management Source Water Protection	Short-term	Measurement of nutrient levels, temperatures and disinfection performance at the outlet.
Work with Interior Health to add tracking of emerging contaminants of concern that are under the City's scope of responsibility.	Wastewater Management Source Water Protection	Medium-term	Effective identification of emerging contaminants
Plan for an alternate treatment plant site to be included in the development of new processes and capacity improvements.	Wastewater Management	Long-term	Minimize number of regulatory exceedances of effluent discharge quality to Okanagan Lake
Transition on-site septic systems to community sewer in urbanized areas. Complete the transition program by 2040.	Wastewater Management Source Water Protection	Long-term	Percentage of properties disposing to sanitary system Area of city not served by community sewer

ENVIRONMENTAL FLOW NEEDS

GUIDING PRINCIPLES: Assume that the quality and quantity of water is available to support a healthy aquatic system.

ACTION	RELATED FOCUS AREAS	TIME FRAME	KEY PERFORMANCE INDICATORS
Incorporate critical flow needs into the City's drought management and water shortage plans.	Water Supply Environmental Flow Needs Stormwater Management & Flood Protection	Short-term	Critical Flow Needs are included in updated drought management and water shortage plans Number of annual breaches of creek critical flows
Investigate modifications to storage infrastructure to optimize release to minimize losses and ensure environmental flow needs are met.	Water Supply Environmental Flow Needs Stormwater Management & Flood Protection	Short-term	Capital plan includes recommended storage and release infrastructure projects
Work with the Province and partners to plan reservoir storage in the upper watersheds and improve management of critical flow releases to our creeks, reducing impacts to allotments for the agricultural industry.	Water Supply Environmental Flow Needs Natural Systems Source Water Protection	Medium-term	Reduced impact on agricultural allotments. Increase in allotments.

STORMWATER MANAGEMENT

GUIDING PRINCIPLES: : Stormwater is effectively managed without negatively impacting riparian areas, property or Okanagan Lake. The community is resilient and resistant to lake and creek flooding.

ACTION	RELATED FOCUS AREAS	TIME FRAME	KEY PERFORMANCE INDICATORS
Establish guidelines for maintenance and operation of naturalized storm ponds and constructed areas.	Stormwater Management & Flood Protection	Short-term	Guidelines developed for management of naturalized storm ponds
Update best management practices for the operation, maintenance, and renewal of storm infrastructure to protect the public, infrastructure, and the environment.	Stormwater Management & Flood Protection	Short-term	Net water quality of creek water entering the City and discharging to Okanagan Lake Percentage of City-owned catch basins and oil-grit separators cleaned annually
Consider implementing a Stormwater Utility to incentivize effective stormwater quality and quantity management from private property.	Stormwater Management & Flood Protection	Short-term	Private properties have effective incentive programs to drive behaviours
Improve stormwater quality by conducting research on public stormwater ponds for nutrient management and habitat development to develop best management practices.	Stormwater Management & Flood Protection Natural Systems Environmental Flow Needs	Medium-term	Measurement of contaminants in creeks
Complete stormwater basin plans that include overland flow routes, safe discharge to natural systems, and account for future development.	Stormwater Management & Flood Protection	Medium-term	Basin Plans completed every 2 years (8 plans, 16 year cycle)
Update engineered solutions for urban development to reduce pollutants and fine sediment at the source.	Stormwater Management & Flood Protection	Medium-term	Changes to development standards that address on site pollutants are implemented.
Ensure all flood protection designs include creek health, riparian health, and fish habitat goals.	Stormwater Management & Flood Protection Partnerships Natural Systems	Long-term	Flood plains where adaptive measures have been implemented.

NATURAL SYSTEMS

GUIDING PRINCIPLES: Account, protect, enhance and restore natural systems that make up our asset inventory and increase environmental recovery.

ACTION	RELATED FOCUS AREAS	TIME FRAME	KEY PERFORMANCE INDICATORS
Create a Habitat Compensation Bank for all environmental permitting requirements.	Natural systems Stormwater and Flood Protection Sourcewater Protection	Short-term	DFO approved projects.
Complete a natural asset inventory by adding water responsibility considerations and incorporating the inventory into the City's Asset Management Program.	Natural Systems	Medium-term	Area of inventoried natural assets Improvements to the Parks Asset Management processes
Investigate possible zoning regulations to support the identification, protection and/or restoration of natural system protection areas	Natural Systems Stormwater and Flood Protection Sourcewater Protection	Medium-term	Change to Zoning Bylaw
Restore creek riparian areas and reduce negative human impacts.	Natural Systems Stormwater and Flood Protection	Long-term	Percentage of creeks meet high grade for fish passage and spawning consistent with ONA criteria Quantity of fish returning to creeks

SOURCEWATER PROTECTION

GUIDING PRINCIPLES: Okanagan Lake and upland watersheds remain a source of high-quality water.

ACTION	RELATED FOCUS AREAS	TIME FRAME	KEY PERFORMANCE INDICATORS
Develop policy for recreational development that minimizes impacts from watercraft, effluent discharges and other items impacting source water Protection Zones identified in the OCP.	Water Supply Source Water protection	Short-term	The number of physical protection barriers identifying water intake locations.
Participate in development of a new Watershed Sustainability Plan for Mission Creek.	Water Supply Wastewater Management Environmental Flow Needs Stormwater Management & Flood Protection Natural Systems Source Water Protection	Medium-term	Added resources in watershed planning Plan endorsement by Council
Provide resources to manage issues within the Source Water Protection Portfolio. This staff can also participate at the Okanagan Basin Water Board.	Water Supply Source Water Protection	Medium-term	Full-time employee responsible for Source Water Protection.
Provide resources to develop long term data analysis on water quality within Okanagan and upper watershed.	Water Supply Source Water Protection	Medium-term	Levels of growth and activity in turbidity prone zones Raw water quality at Okanagan Lake intakes meets or exceeds Interior Health Filtration Exemption requirements Emerging contaminants are effectively identified.

APPENDIX B

Peer Review Workshop Summary

Water Security Planning

Peer Review Workshop Summary

June 14th, 2023

Coast Capri Hotel, Kelowna, BC

City of Kelowna | August 29, 2023

City of Kelowna

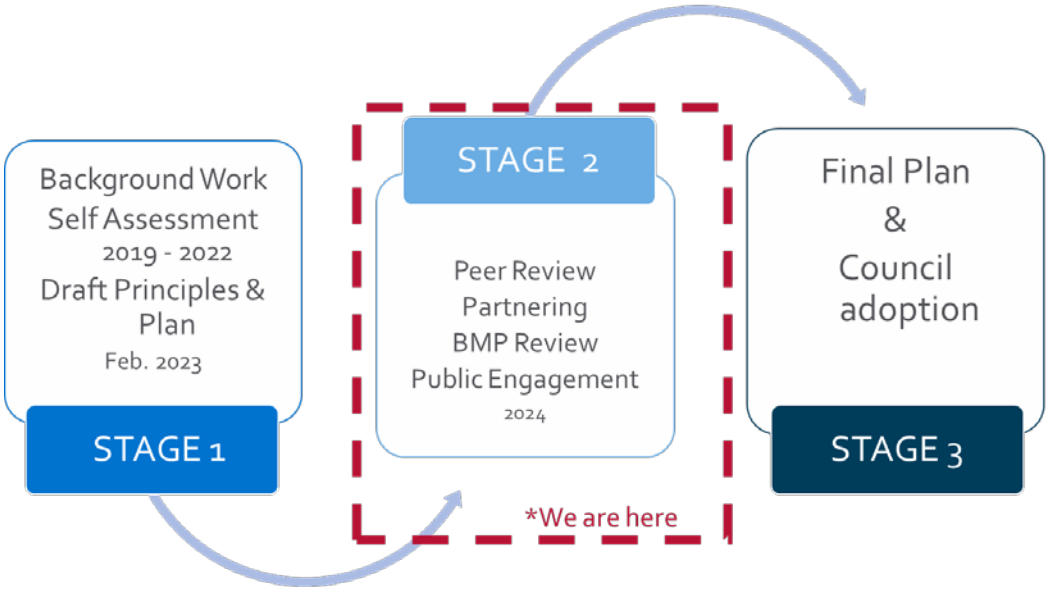
1. Introduction

Kelowna is developing its first Water Security Plan with the goal of:

- Achieving more holistic and sustainable water management,
- Guiding local and regional decision-making and prioritization, and
- Framing decision making from a "water lens".

The City understands the multiple interests and decisions that take place affecting local water management. Kelowna looks to implement sustainable best management practices to address many of the challenges it faces, and the risks associated with those challenges.

Developing the Water Security Plan involves three stages:



The June 14, 2023 peer review session is part of Stage 2, and tasks interested and knowledgeable associated agency representatives to help review and add value to the draft Water Security Plan. More work is still required to explore partnerships, First Nations knowledge, and collaboration on Best Management Practices for the community. A draft revised plan will then be presented to the Community. The feedback will help create the final plan for adoption by Council.

The City hosted 34 peers from 11 organizations at a workshop to collaborate and gather feedback on the area's water security and best water management practices. These workshop participants represented the Province, local governments, improvement districts, Interior Health and local businesses. A list of participants is found in Appendix A.

2. Process

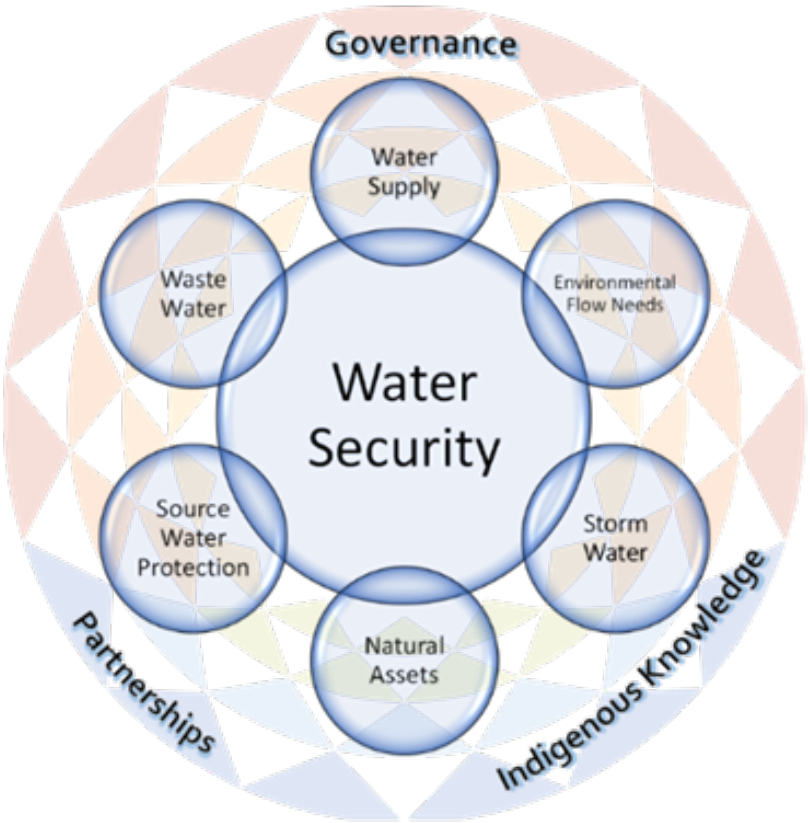
The workshop consisted of six separate sessions with independent topics, lasting most of the day. Facilitators, selected in advance by the City, were tasked to capture feedback and comments, and provide clarity and context where needed.

Participants were asked to familiarize themselves with the topics in advance of the meeting. The following link to the individual background documents was provided:

Water Security Plan - Compiled Version (kelowna.ca)

Each discussion group was provided with a facilitator, easel and background information on each topic or sector. Participants were encouraged to introduce themselves, and outline what brought them to the session. The Project Leads then provided a brief presentation on the topic, followed by focus group discussion.

Following the discussions, each group was asked to review their notes, and agree on the three or four key messages they felt warranted priority action or review. Each facilitator was then asked to present their findings. The feedback was compiled into this report.



3. Acknowledgements

a) Syilx/Okanagan People

Located on the traditional, ancestral, unceded territory of the syilx/Okanagan people, Kelowna is the largest municipality in the British Columbia interior and relies on the Okanagan Lake basin for its water supply. We share waters from Okanagan Lake with many neighbouring communities and First Nations.

Special guests to the meeting included members of the syilx First Nation. Pamela Barnes and Wilfred Barnes Grouse, syilx knowledge keepers, delivered a special welcome that recognized the territory, and presented an interesting interpretive story of the lake and the fish.

We were pleased to see participants from the Okanagan Nation Alliance, whose biologists and knowledge-keepers have initiated water studies, measurements, and are helping develop processes leading to positive change in our community.

b) Special Guests from the Province

Provincial participants included Dr. Silvina Mema, the Drinking Water Officer for Interior Health, and Mr. Brian Bedford, Executive Director of Local Government Infrastructure and Finance within the Ministry of Municipal Affairs. Both Dr. Mema and Mr. Bedford have been valued supporters of the City's Water Security strategy, and both see the opportunity to partner towards a more resilient, high-quality supply of drinking water and water for agriculture. City staff have reached out and collaborated with other Ministries involved in water and watershed security throughout Stage 1.

The provincial government plays a significant role in Water Security. From water and land regulations to empowering and funding other agencies in sustainable management practices and/or infrastructure, they arguably carry the most responsibility in this endeavor.

Over the years, provincial management and/or regulation of Water Security elements have been assigned to several different Ministries and Health Authorities. The regulatory framework is complex, - overlapping and perhaps even lacking in terms of fulfilling the growing needs of regional Water Security. Partnerships with local governments and other agencies will become more and more necessary to sustainably manage Water Security in the years ahead.

The participation by these representatives was both encouraging to the local agencies and invaluable to the City as it seeks to develop partnerships and a long-term best water management strategy for Kelowna's watersheds. We very much appreciated their collaboration and thank them for their participation.

c) Peer Group

Equally important was the participation of our local agencies, water sector specialists, and many of the people with whom we share a responsibility to assure our water is well managed and respected. We appreciated their participation and enthusiasm in this Water Security Planning effort.

4. What We Heard

A high-level summary of the workshops is outlined below. A more detailed summary of information from each engagement table is provided in Appendix B.

a) Water Supply

The discussions about water supply, conservation, and management focused on several key areas. Firstly, the importance of alternate water sources and storage; Secondly, promoting water re-use and acceptance, including private water recycling methods such as rain barrels; Thirdly, the discussions focused on strategies such as separating domestic and irrigation water use, interconnection between water providers, and ensuring fair treatment of different industries. Lastly, group responses stressed the significance of protecting aquifers, prioritizing agriculture, and promoting efficiency in irrigation. Collaboration, public education, and incentivizing water conservation are also needed. Notably absent from these discussions was the acknowledgement of First Nations legal requirements to water, and accountability to the public.

The top issues to note for the Water Supply Sector were:

- Water supply resiliency requires interconnection between providers, storage in headwaters, and long-term planning for infrastructure needs and funding.
- Promote water smart education, address changing targets in the community, then plan for long-term water needs in the community.
- Water management and supply in the local watershed requires collaboration. The City can play a role or lead with its understanding of urban versus agricultural needs.

b) Wastewater

The groups highlighted the importance of aligning wastewater effluent monitoring standards with local issues and Okanagan Lake's health, while keeping an eye on emerging pollutants. The wastewater treatment infrastructure must be regularly maintained and contain resiliency and safeguards. The City relies on other communities adjacent to or upstream of Okanagan Lake to have best management practices in place for safe effluent discharge, monitoring and reporting. Other uses for treated effluent should be planned and implemented in non-food related activities such as parks and forests. Future wastewater challenges involve assuring effective treatment of emerging contaminants and pharmaceuticals. Finally, there was consensus on the need to replace urban septic systems for environmental protection.

The top issues to note for the Wastewater Sector were:

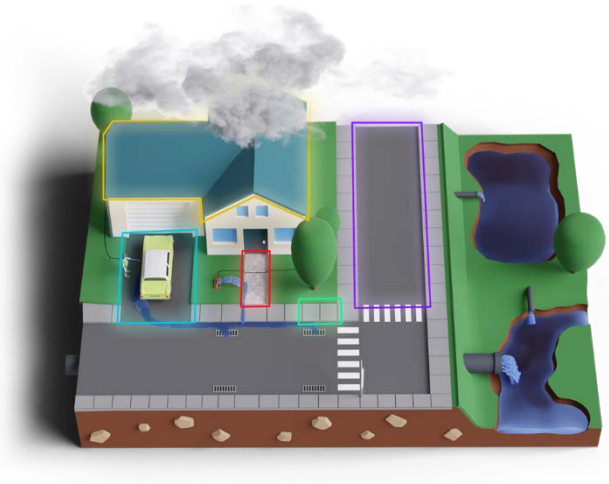
- High quality effluent discharge and quality standards must be a key goal for source control in Okanagan Lake.
- Okanagan communities must work with IHA to track emerging contaminants in the community.
- Public awareness needs to be reinforced about the importance of acceptable discharges to the sanitary system.

c) Storm Water

Managing stormwater systems is usually a constant challenge for local governments, as the assets are often considered naturalized, and potentially exposed to maintenance restrictions due to conflicting legislation at the Provincial level. Stormwater quality is a challenge to measure. Urbanized storm systems face shocks during first flush and runoff events and can be impacted by illegal dumping around creeks. Design capacities are being impacted by climate change. Flood protection is also needed to enhance resilience, however changes in water license-based frameworks are needed. Measures and transparent reporting are needed to improve stormwater practices in the region and protect Okanagan Lake.

The top issues to note for the Stormwater Sector were:

- Local governments require a broader authority to manage stormwater and natural systems within their boundaries.
- Communities can then apply best management practices provided through a collaborative process between government agencies and stakeholder organizations.
- Measures to improve stormwater quality are needed.



d) Source Water Protection

This discussion examined the City's role in coordinating organizations, raising awareness, and challenging assumptions related to source water protection of upper watersheds and Okanagan Lake. The City is a beneficiary of high-quality water in Okanagan Lake and must always practice and promote source water control to maintain its filtration exemption status. This includes wastewater, stormwater, flood protection, watershed protection and effective water use practices throughout the Okanagan. The groups focused on mechanisms to deploy the necessary resources, strengthening bylaws, and encouraging senior government action. The challenges include navigating through legislation, multiple agencies, limited funding, and limited resources. Collaboration with agencies like the Okanagan Basin Water Board in a broader application are seen as opportunities. The group emphasized water quality preservation, stakeholder collaboration, and the need for long-term funding and government support for success.

The top issues in this category were summarized as:

- Source Water Protection is a responsibility of all users, visitors and businesses that operate within the Okanagan Lake watershed.
- The City can play a lead role through coordination of local resources, improving public education, enforcing environmental policies & regulations, and information sharing.
- The City can also play a lead role in funding partnerships with senior government.
- Sector planning must apply to both urban and rural sectors, focusing on responsible water use and land management to improve or protect the water source.

e) Environmental Flow Needs

The groups discussed various water management and environmental challenges, including fish species management, water quality, drought conditions, and climate change impacts. They emphasized the importance of collaboration, education, and infrastructure upgrades. Key concerns included invasive species, development practices, and water licenses overallocation. There is a need for more data, more analysis, improved forest management practices, and a better understanding of aquifer connections to creeks. Strategies for adaptation to multi-year droughts and enhancing water storage were emphasized, along with the importance of stewardship and empowerment.

The top issues to be addressed further were:

- Flexibility in licensing in the upper watersheds, particularly storage licenses, to allow for additional supply, flood protection and EFN purposes.
- Collect data to measure success and failure.
- Increase the general awareness of EFNs and their importance to the City and surrounding community.
- Identify operational changes and include watershed management and stewardship to protect all Kelowna watersheds.

f) Natural Systems

This session involved discussions around the need for conservation and restoration of natural systems like wetlands and floodplains in the City. The benefits included wildlife habitat, improved water quality, and flood control, to name a few. Challenges include identifying and defining natural assets, understanding their functions, and managing the competing interests that impact their preservation. There is a lack of understanding, leading to poor management practices and funding shortfalls. The consequence of this is higher costs to replace their function or losing that function altogether. The development community's involvement is crucial, and senior government needs to provide a clearer regulatory framework to ensure long-term sustainability and protection of natural assets.

The top issues to be addressed further were:

- Natural assets must be inventoried completely at the City, including their sub-components.
- This helps establish a Level of Service and performance indicators as a responsibility for the community.
    - The City must assure that natural systems are protected in the development approval process. It must clearly be understood that replacing that benefit can be more expensive or impossible to achieve.
- The link between City Parks/operations and Natural Systems is strong. This is an awareness opportunity to educate the public and develop best management practices that incorporate natural systems.

g) Partnerships

The group discussions acknowledged that collaboration and involvement from multiple entities are crucial in ensuring water security in the Okanagan. They highlight the importance of partnerships with the provincial ministries, federal agencies, First Nations, land trusts, cattle ranching associations, and academic institutions. Engaging with BC Parks, landowners, and water users under licenses of occupation was also emphasized. It was noted that there are challenges in prioritizing water security and obtaining support from council members and politicians. It suggests building strong relationships with Okanagan municipalities, water districts, and stakeholders, addressing funding gaps, and improving communication with water purveyors and agriculture. The groups emphasized the need for collaboration, advocacy, and liaison with relevant authorities to promote water security in Kelowna and the Okanagan.

2040 OCP Objective 14.3 - Preserve Okanagan Lake for its environmental, traditional, cultural, spiritual, and recreational values.

The top topics in the Partnership discussions involved:

- Partnerships, including funding, are needed to address resiliency issues and climate change impacts to all water sectors in this plan.
- Other communities, governing bodies and indigenous communities must partner to protect Okanagan Lake.
- Partnerships in water security extend from data collection to public awareness to 'how we are doing' (KPI's) and commitment to continuous improvement.
- Responsibilities must be assigned and accepted in formal partnerships.

5. Next Steps

The next steps in this Stage 2 process are to consider the peer review information provided in this report, then incorporate key elements into the draft Water Security Plan. Engagement with the public on the draft Plan is anticipated to start in the fall of 2023. One of the key goals of this engagement is to raise public awareness to the complexities and responsibilities of water security. Another goal is to gauge public support for the Water Security Plan prior to bringing back recommendations before Council.

Concurrently, staff will continue to look at opportunities for partnerships, to build relationships, align resources, assign responsibilities and work towards a sustainable funding program.

The peer review process identified some priority actions:

1. Develop a City-wide water supply resiliency strategy in partnership with Municipal Affairs.
2. Explore a partnership framework towards a Kelowna watershed security strategy with Provincial leadership. Key partners could include the OBWB, First Nations, local governments and the Province. Such an initiative could encompass five of the City's six water management sectors.
3. Partner with interested parties to develop long term key performance indicators for the health of Okanagan Lake.
4. Delegate responsibilities to City water management sector leads to address the high-risk areas identified for their sector. This includes updating and implementing best management practices.

Appendix A – List of Attendees

Kellie Garcia	Okanagan Basin Water Board
Anna Warwick Sears	Okanagan Basin Water Board
Pamela Barnes	Syilx knowledge keeper
Wilfred Barnes Grouse	Syilx knowledge keeper
Kary Fell	Westbank First Nation
Elinor McGrath	Okanagan Nation Alliance
Travis Kendall	Regional District of Central Okanagan
Brendan Russell	Black Mountain Irrigation District
Bob Hrasko	Black Mountain Irrigation District
Collin Day	Black Mountain Irrigation District
Patti Meger	District of Lake Country
Kiel Wilkie	District of Lake Country
Greg Buchholz	District of Lake Country
Silvina Mema	Interior Health Authority
Judi Ekkert	Interior Health Authority
John Ivor Norlin	Interior Health Authority
Brian Bedford	Ministry of Municipal Affairs
Rosalind Werner	Okanagan Climate Hub
Ed Hoppe	City of Kelowna
Kevin McCluskey	City of Kelowna
Kevin Van Vliet	City of Kelowna – Project Lead
Rod MacLean	City of Kelowna – Project Lead
Mike Murrell	City of Kelowna
Andy Weremy	City of Kelowna
Jennifer Miles	City of Kelowna
Maddie Poole	City of Kelowna - Student
Tracy Guidi	City of Kelowna - Facilitator
Robinson Puche	City of Kelowna – Facilitator
Luke Dempsey	City of Kelowna – Facilitator
Jim Hager	City of Kelowna - Facilitator
Desni Bachman	City of Kelowna – Facilitator
Ron Westlake	Lead Consultant
Glen Lucas	BC Fruit Growers

Appendix B – Workshop Detail Summary

Water Supply

June 14th/2023 Workshop Feedback Summary

Theme	Group 1	Group 2	Group 3	Group 4	Group 5
Summary	The discussions about water supply, conservation, and management focused on several key areas. Firstly, the importance of alternate water sources and storage; Secondly, promoting water re-use and acceptance, including private water recycling methods such as rain barrels; Thirdly, the discussions focus on strategies such as separating domestic and irrigation water use, interconnection between water providers, and ensuring fair treatment of different industries. Lastly, the report stresses the significance of protecting aquifers, prioritizing agriculture, and promoting efficiency in irrigation. Collaboration, public education, and incentivizing water conservation are also needed. Notably absent from these discussions was the acknowledgement of First Nations legal requirements to water, and accountability to the public. The top issues to note for the Water Supply Sector were: 1. Water supply resiliency requires interconnection between providers, storage in headwaters, and long-term planning for needs and funding discussions. 2. Promote water smart education, address changing targets in the community, then plan for long-term water needs in the community. 3. Water management and supply in the local watershed requires collaboration. The City can play a role or lead with its understanding of urban versus agricultural needs.				
Table discussions	This group reviewed the various aspects of water supply, conservation, and water management. Some elements to consider included the importance of alternate water sources and storage, promoting water re-use and acceptance, on-site water recycling opportunities (rain barrels), separating domestic and irrigation water use, and interconnection between water providers. The group consistently noted the need for fair treatment of different industries and collaboration with the agriculture sector. Protecting aquifers, prioritizing agriculture in water plans, and promoting efficiency in irrigation are emphasized. The conversation touched on watershed protection, proactive forestry management, public education, and incentivizing water conservation.	The group highlighted challenges and recommendations related to water supply and management. They emphasized the need for clarity on water supply boundaries, coordination among multiple purveyors, and prioritization of water use. Maintaining supply quantity and quality has co-benefits for water security sectors. Concerns included invasive mussels, uncertainty in water licensing frameworks, and the lack of tracking and real-time decision-making tools. They suggested water conservation initiatives for agriculture and stressed the importance of interconnects and governance. Planning efforts must consider climate change and unforeseen events while evaluating historic data for reliability and limitations.	This group highlighted key issues and priorities related to water supply management. Challenges include the impending growth and climate change impacts, uncertainties in licensing, and resiliency issues among purveyors. Shifting requirements for EFN's and fragmented watershed planning further complicate the situation. The report emphasizes the need to adapt to changing targets and enhance resiliency through storage and interconnections. Supporting agriculture, establishing government partnerships, and ensuring an enforceable watershed plan are also crucial. Improving upper watershed areas, increasing water sources, and better transmission between sources are recommended. Maybe a coordinating body/group can improve collaboration. Public awareness and fair infrastructure cost apportionment are additional considerations.	The region faces challenges related to water supply and conservation. Climate change impacts the growing season, increasing water demand but reducing water supply. Snowpack influences water demand for DLC and BMID. Provincial regulations limit the autonomy of municipalities, affecting water conservation efforts. In residential areas, the CoK must pump water, while DLC and BMID rely mostly on gravity. Some residents disregard water restrictions, highlighting the importance of education. Agricultural contingency plans prioritize crops based on long-term impacts, while BMID has universal water restrictions. Collaboration among water purveyors and infrastructure development, including interconnections, are vital for a resilient and comprehensive water supply system.	This group discussed considerations and challenges in water supply and management. They noted the importance of a secondary water supply for contingency planning and interconnections. Potential issues included flooding at wastewater treatment facilities and the need for alternative water sources. They explored concepts of Inter-reliance, housing densification, fire flows, and strategic use of different sources. The significance of metered water consumption, standardization, and the need for conservation enforcement are discussed. Resiliency, managing wildfires, long-term planning, and addressing growth stress are emphasized. Public education, funding structures, and designing an ideal, interconnected, and resilient system are vital. Finally, consumer awareness is deemed crucial for efficient water management.
Top issues at each table	1. Water supply resiliency must address Interconnection abilities between purveyors today and in the future. 2. The City can promote Water Smart Education in schools and community. The public need to understand how water is valued. 3. Water security must include the agricultural community. Trust starts with building the plan with Ag users.	1. It was hard to separate the topic of supply from partnerships – internal or external. 2. The legacy supply infrastructure in the City will take years to renew and replace. Any plans must consider multiple water sources and the infrastructure needed for resiliency to all customers. 3. Should there be a formal plan to consolidate the Improvement Districts. Does the Province have a plan? 4. Risk tolerance for urban water supply compared to Agricultural production. This should be addressed.	1. Strategies are needed to address the fast-changing targets in our community. New expectations are coming into play that may lead to changes to consumption patterns, allotments, emergency relief, Environmental Flow relief and new climate change fluctuations. 2. Resiliency must consider storage in the headwaters and mutually beneficial interconnectivity.	1. The City cannot lead the charge in the Okanagan, but could lead a local watershed strategy. There should be a collective and comprehensive regional strategy with all water suppliers, licensees and purveyors. 2. There are opportunities for interconnections between purveyors in the City.	1. Water supply planning and decisions in the region must identify needs in the 20 year, 40 year and longer term horizon. 2. Discussion is needed to understand the extend of interconnection, the capacity needed and how it will all be funded. Are we expecting a fully interconnected system or flows for emergency needs only.

Wastewater

June 14th/2023 Workshop Feedback Summary

Theme	Group 1	Group 2
Summary	The groups highlighted the importance of aligning wastewater effluent monitoring standards with local issues and Okanagan Lake's health, while keeping an eye on emerging pollutants. The wastewater treatment infrastructure must be regularly maintained, and contain resiliency and safeguards. The City relies on other communities adjacent to or upstream of Okanagan Lake to have best management practices in place for safe effluent discharge, monitoring and reporting. Other uses for treated effluent should be planned and implemented in non-food related activities such as parks and forests. Future wastewater challenges involve assuring effective treatment of emerging contaminants and pharmaceuticals. Finally, there was consensus on the need to replace urban septic systems for environmental protection. The top issues to note for the Wastewater Sector were: 1. High quality effluent discharge and quality standards must be a key goal for source control in Okanagan Lake. 2. Okanagan communities must work with IHA to track emerging contaminants in the community. 3. Public awareness needs to be reinforced about the importance of acceptable discharges to the sanitary system.	
Summary of discussions by Table	This group highlighted the need to align wastewater effluent monitoring standards with local issues, not just Provincial regulation. They mentioned linking standards to the lake's health and keeping up with emerging pollutants. Specialized local facility impacts were addressed, as well as quantifying the biggest threats to the lake. Long-term financial sustainability of infrastructure is required, along with better tracking and alignment of development and infrastructure planning. In the end, standardized effluent standards in communities on Okanagan Lake are needed, with a focus on monitoring, reporting, and quality objectives.	This discussion focused treated wastewater management practices. Treated wastewater effluent use is historically not permitted in food production. There are opportunities for use in several related areas such as parks, naturalized areas and forested areas. This could include re-use options such as "purple" pipe for irrigation. Future wastewater treatment may need to include emerging contaminants, and whether digestion is needed to produce Class A biosolids for direct land application. The group also discussed the need to replace urbanized septic systems to protect the environment. Septic systems are managed through the province, although there is no mandate for removal.
Top 3 Issues identified at each table	1. Wastewater effluent monitoring standards should align with local interests and practices, and not just driven by regulations. 2. There must be consistent effluent discharge and quality standards throughout the Okanagan. 3. The City should work with IHA to possibly track emerging contaminant categories such as pharmaceuticals, COVID, plastics, or other modern-day elements of concern.	1. The public needs to be advised regularly on the importance of acceptable discharges to the sanitary system. 2. The City must provide landfill leachate pre-treatment prior to disposal to the sanitary system. 3. Consider effluent as backup water source for survival for natural or agricultural systems during a drought.

Stormwater

June 14th/2023 Workshop Feedback Summary

Theme	Group 1	Group 2
Summary	Managing stormwater systems is a constant challenge for local governments, as the assets are often considered naturalized, and potentially exposed to maintenance restrictions due to conflicting legislation at the Provincial level. Stormwater quality is a challenge to measure. Urbanized storm systems face shocks during first flush and runoff events, and often include the illegal dumping around creeks. Design capacities are being impacted by climate change. Flood protection is also needed to enhance resilience, however changes in water license-based frameworks are needed. Measures and measurement are needed to improve stormwater practices in the region, and protect Okanagan Lake. The top issues to note for the Stormwater Sector were: 1. Local governments require a broader authority to manage stormwater and natural systems within its boundaries. 2. Communities can then apply best management practices provided through a collaborative process between government agencies and stakeholder organizations. 3. Measures to improve stormwater quality are needed.	
Summary of discussions by Table	This discussion highlighted the need for improved guidance on stormwater infrastructure maintenance, including consideration of natural assets. Local governments are normally responsible for stormwater management, and need some confidence that maintaining instream works are part of their routing. They discussed exploring water license-based frameworks for stormwater facility management. They noted conflicting mandates between senior government ministries, particularly between DFO and Provincial Acts, whose approach to fish passage & protection, flood protection, stormwater quality and maintenance often conflict, causing confusing and avoidance. The group touched on source control monitoring and treatment of private discharges.	This group discussed urban stormwater management issues, such as first flush shocks, road runoff pollution, illegal dumping, and increasing yard waste dumping. Their discussion looked at solutions that could include on-site stormwater retention, decentralized systems, stormwater re-use and exploring diversions or storm ponds. Addressing nutrient concentrations and identifying improved practices should improve water quality and quantity.
Top 3 Issues identified at each table	1. Local governments require the authority to manage stormwater and natural systems within its boundaries. 2. Senior government agencies can monitor local stormwater management practices, and encourage good practice at all levels.	1. Improving stormwater quality starts by managing pollutants and quantity at the source, or on-site upstream of the service point. 2. Explore practices that retain more stormwater on site (both Residential and Commercial) 3. Research is needed to find where "excellent" stormwater practices are happening around the world that would be applicable to the Okanagan?

Source Water Protection

June 14th/2023 Workshop Feedback Summary

Theme	Group 1	Group 2	Group 3
Summary	This discussion examined the City's role in coordinating organizations, raising awareness, and challenging assumptions related to source water protection of upper watersheds and Okanagan Lake. The City is a beneficiary of high quality water in Okanagan, and must always practice and promote source water control to maintain its filtration exemption status. This includes wastewater, stormwater, flood protection, watershed protection and effective water use practices throughout the Okanagan. The groups focused on mechanisms to deploy the necessary resources, strengthening bylaws, and encouraging senior government action. The challenges include navigating through legislation, multiple agencies, limited funding and limited resources. Collaboration with agencies like the Okanagan Basin Water Board in a broader application are seen as opportunities. The group emphasized water quality preservation, stakeholder collaboration, and the need for long-term funding and government support for success. The top issues in this category were summarized as: 1. Source Water Protection is a responsibility to all users, visitors and businesses that operate within the Okanagan Lake watershed. 2. The City can play a lead role through coordination of local resources, improving public education, enforcing environmental policies & regulations, and information sharing. 3. The City can also play a lead role in funding partnerships with senior government. 4. Sector planning must apply to both urban and agricultural sectors, focusing on responsible water use and land management to improve or protect the water source.		
Table Discussion	This group noted that the City's role in SWP could encompass a number of vital aspects including leading and coordinating multiple organizations, building public awareness, and challenging assumptions made by senior government. Controlling and safeguarding water resources is crucial, considering industries, climate change, and agriculture's impact. Strengthening City bylaws, aligning departments, and encouraging provincial involvement are key steps for progress. Challenges include navigating multiple agencies and resource limitations. Collaborating with agencies like the Okanagan Basin Water Board and exploring basin-wide plans present opportunities for resilience and interconnection. Overall, SWP must apply to all users around Okanagan Lake, and must be considered as broader than the City of Kelowna.	This group included members from the City, other municipalities and improvement districts and discussed the need for water quality preservation, with the Freshet period being a major concern. The City needs to formalize management strategies to include collaboration with stakeholders, leveraging resources and sharing information. A long-term funding mechanism is needed for long term sustainable water quality. Priority must be given to working with First Nations, public education and responsible water usage. Other strategies may be to protect and improve water sources, including those to agricultural areas.	This group discussed the City's challenges involving keeping Okanagan Lake clean and safe as a drinking water source. The discussion focused building strong partnerships and breaking jurisdiction barriers. Participating in policy that regulates recreation, ranching and forestry activities must be addressed. The City can offer dedicated personnel, coordinators and resources for watershed management and possible management of the headwaters. Discussions included data collection, environmental policy enforcement, provincial involvement, recreation, industrial operations, and fostering innovation. Adequate funding, resources and senior government support are all needed to succeed.
Top 3 Issues identified at each table	1. Source Water Protection must apply to all users around Okanagan Lake, and must be considered as broader than the City of Kelowna. 2. Source Water Protection of Okanagan Lake is a priority for the City, as the utility water supply relies on clean water from the Lake. 3. The threats in the SWOT need more emphasis in these documents. 4. The City can assist with coordination of local resources, manpower, public education and awareness, and be a partner in obtaining senior government funding.	1. Reducing water quality during a freshet/flood event by improving practices in the upper watersheds: a. Monitor, and if necessary, police recreation practices. b. Participate directly to promote best forestry practices. c. Focus on Action, not just Talk. d. Formalize watershed best management strategies at the City, including engagement with stakeholders. e. Work, talk, collaborate. 2. SWP needs to consider both water quality and quantity, and must apply to both urban and agricultural sectors. a. Focus on responsible water use. b. Poor source quality can lead to larger budget requirements (filtration) in the future. c. Threats can include accidental spills, or water borne diseases (like cryptosporidium outbreaks).	1. City can play a lead role in SWP. o Public education is critical. o Enforcement of environmental policies & regulations. 2. Educate the public on the importance of the tie between SWP and filtration deferral, and maintaining high water quality in Okanagan Lake? 3. Data collection and sharing needs must include all stakeholders in the watershed.

Environmental Flow Needs

June 14th/2023 Workshop Feedback Summary

Theme	Table 1	Table 2	Table 3
Summary	The groups discussed various water management and environmental challenges, including fish species management, water quality, drought conditions, and climate change impacts. They emphasized the importance of collaboration, education, and infrastructure upgrades. Key concerns included invasive species, development practices, and water licenses overallocation. There is a need for more data, more analysis, improved forest management practices, and a better understanding of aquifer connections to creeks. Strategies for adaptation to multi-year droughts and enhancing water storage were emphasized, along with the importance of stewardship and empowerment. The issues that need to be addressed are: 1. Flexibility in licensing in the upper watersheds, particularly storage licenses, to allow for additional supply, flood protection and EFN purposes. 2. Collect data to measure success and failure. 3. Increase the general awareness of EFNs and their importance to the City and surrounding community. 4. Identify operational changes to include watershed management and stewardship to protect all Kelowna watersheds.		
Table Summary	This group discussed topics around maintenance, water temperatures and public education by looking through the "Fish lens". Water quality was also discussed, noting the importance of critical flows, effective sediment control, poor development practice and enhanced data/measurement. The City could work with other agencies and municipalities to further emphasize environmental flow needs. Education about EFN's is key, and must be part of designs that include flood protection, riparian improvements, fish passage, creek improvements, and stewardship/empowerment. This group also noted operational challenges under drought conditions, groundwater influences, and the difficulties around species monitoring.	This group discussed multiple water management and environmental challenges related to new EFN policies, noting threats like invasive mussels, eutrophic conditions and catastrophic events. They discussed the possibilities for the need to adapt to multi-year droughts, impacts of more intense rainfall patterns, and possible licensing changes that include EFN's, agricultural supply, domestic use, flood protection and water storage improvements. They noted the importance of collaboration, updating creek water use plans, developing a better understanding of base flows, and exploring funding needs. Other parameters include forest management practices, wildfire protection, and data collection.	This group started with developing a general understanding of fish species, development impacts, riparian needs, general watershed management and strategies, groundwater protection, and impacts of water overallocation. They also discussed climate change impacts related to infrastructure, improved forestry management, and crown lands management. They touched on topics including potable vs. non-potable water sources, increased fire protection in the watershed and the impacts of pumping from aquifers on creek water temperature.

Top 3 Issues per table	• Agriculture needs accounts for much of the licensed water need, but does not necessarily account for EFN. The agricultural community may need to adjust. How? Farm planning? Adjusted cropping practices?
	• There is a challenge to assure awareness and agreement among groups with existing allotments (ie. Agricultural Community)?
	• More research needed in understanding groundwater influences in creeks. There is uncertainty over these impacts to improve temperature conditions, ephemeral conditions or abilities to supplement creek flows.
		• Improved data and information about EFN's and flow.
		• Support EFNs with additional water storage
		  ○ Seek Federal/Provincial support for new/enhanced dams.
		  ○ Provincial support for additional purposes such as supply, EFN/conservation and flood mitigation.
		• A better understanding is needed of cumulative impacts from existing forest management operations. Who oversees this, as municipalities and local purveyors have a stake?
			• Is there a solution through licensing to determine priority for urban, agricultural or environmental need?
			• Today, EFN's are not guaranteed. there is some capability to enhance flows to higher levels, however this requires storage. it is difficult to guarantee minimum flows. Are there opportunities for additional infrastructure, changed watershed practices or added resiliency?
			• There is a need to measure success and failure. Measures and key performance indicators are needed here for municipalities.

Natural Systems

June 14th/2023 Workshop Feedback Summary

Theme	Table 1	Table 2
Summary	This session involved discussions around the need for conservation and restoration of natural systems like wetlands and floodplains in the City. The benefits included wildlife habitat, improved water quality, and flood control, to name a few. Challenges include identifying and defining natural assets, understanding their functions, and managing the competing interests that impact their preservation. There is a lack of understanding, leading to poor management practices and funding shortfalls. The consequence of this is higher costs to replace their function, or losing that function allo-together. The development community's involvement is crucial, and senior government needs to provide a clearer regulatory framework to ensure long-term sustainability and protection of natural assets. The top issues to be addressed further were: 1. Natural assets must be inventoried completely at the City, including their sub-components? a. This helps establish a LOS and KPI as a responsibility for the community. 2. The City must assure that natural systems are protected in the development process. It must clearly be understood that replacing that benefit can be more expensive or impossible to achieve. 3. The link between City Parks/operations and Natural Systems is strong. This is an awareness opportunity to educate the public and develop best management practices that incorporate natural systems.	
Summary of discussions by Table	This group discussed the need for conservation and restoration of natural systems such as wetlands and floodplains. They noted the important benefits including wildlife habitat, improved water quality and flood attenuation. Challenges persist in distinguishing between natural and disturbed areas, and in implementing protection and maintenance practices given the regulatory restrictions. A process is needed properly identify natural assets, and understanding their function and longevity for future sustainability. Kelowna can undertake actions to conserve water, educate residents and collaborate with partners to expand and protect natural systems. The City is challenged with managing competing interests while preserving these natural areas into the future, but this must include an understanding of the impacts such as lost water supply, natural water filtration and the costs to replace these natural system functions.	This group discussed how Kelowna faces challenges in designing elements that assure natural systems are not impacted. These challenges come from a lack of understanding of natural system benefits, and the shortfall of protections in the processes and reviews, the lack of standards/bylaws, and very limited operation and maintenance practices. It was emphasized that the development community is an influential stakeholder in natural asset protection. Cumulative impacts on natural systems become significant, and the City should pay more attention during the development process. The example discussed was Jack Smith Lake, which did not include the water license to supplement the hydrology. Some possibilities include identifying utility or natural systems as park assets, and incorporating them as much as possible in new park designs. A clear regulatory framework around natural and urbanized natural assets is needed. Funding mechanisms to protect natural assets are not available.
Top 3 Issues identified at each table	– What are the natural assets in the City and their sub-components? What are we protecting? → This helps establish a LOS and KPI as a responsibility for the community. – Establish a priority of importance to natural assets, including an understanding of their natural (or constructed) supporting elements. – City must assure that natural systems are protected in the development process. It is assumed that all natural assets provide benefit to other natural systems, such as water quality, soil quality, natural plantings or wildlife. Replacing that benefit can be more expensive or impossible to achieve.	– How can the City maintain or expand its "inventory" of natural systems? – Urban area plans must include a broader understanding of how the natural assets exist, function and perform in the long term with each proposed development. – The link between Parks and Natural Systems is strong. This is an awareness opportunity to educate the public and develop best management practices that incorporate natural systems.

Partnerships

June 14th/2023 Workshop Feedback Summary

Theme	Group 1	Group 2	Group 3	Group 4
Summary	Collaboration and participation from multiple entities will be crucial in ensuring water security in the Okanagan. The discussions highlighted the importance of partnerships with Provincial Ministries, BC Parks, landowners, federal agencies, First Nations, land trusts, cattle ranching associations, and academic institutions. Engaging with other water users under licenses of occupation was also emphasized. These groups noted the challenges in prioritizing water security and obtaining support from council members and politicians. These strong relationships include addressing funding gaps, and improving communication with water purveyors, and assuring that agriculture is always considered. Emphasis included the need for collaboration, advocacy, and liaison with relevant authorities to promote water security in Kelowna and the Okanagan. The top topics in the Partnership discussions involved: 1. Partnerships, including funding, are needed to address resiliency issues and climate change impacts to all water sectors in this plan. 2. Other communities, governing bodies and indigenous communities must partner to protect Okanagan Lake. 3. Partnerships in water security extend from data collection to public awareness (KPI's) to determine how we are doing. 4. Responsibilities must be assigned and accepted in any formal partnership.			
Summary of discussions by Table	Collaboration and involvement of various entities are key to addressing water security. Partnerships with the Ministry of Environment, federal agencies, and First Nations can support Environmental Flow Needs (EFN) and restoration initiatives. Engaging with land trusts, cattle ranching associations, and academic institutions strengthens water stewardship efforts. Coordinating with BC Parks, landowners, and water users under licenses of occupation is important. Public involvement, water reuse initiatives, and shared databases for research and projects within the watershed enhance comprehensive water management.	The City of Kelowna faces challenges in prioritizing water security and obtaining buy-in from council members and politicians. Internal collaboration and understanding the legal responsibilities of financial decisions are important. Partnerships with First Nations, community education, and empowerment are crucial. Building strong relationships with Okanagan municipalities, water districts, and stakeholders is emphasized. Addressing funding gaps and securing provincial support for water districts are highlighted. Collaboration with water purveyors and agriculture, along with communication improvement, is crucial for redundancy and water reduction efforts.	This group discussed potential areas of collaboration between other organizations and Kelowna to enhance water security. The suggested approaches include sharing knowledge and best practices with operators, developing standards and training programs, partnering with the province on watershed security plans, conducting research with the OBWB, raising public awareness, engaging with schools and First Nations, assessing long-term water supply needs, facilitating interconnection discussions, identifying funding strategies, and fostering joint-management initiatives. The group emphasized the importance of collaboration, advocacy, and liaison with relevant authorities to promote water security in Kelowna and the Okanagan.	This group discussed critical issues in water management. They noted concerns of inadequate infrastructure, the lack of partnerships between relevant authorities, and challenges related to water licensing and maintenance. The group emphasized a need to identify and tackle the most pressing problems, secure funding for shared projects, and establish a watershed-wide authority. They also called for clarity in responsibilities, active involvement of policy makers, and funding support for water security initiatives.
Top 3 Issues identified at each table	→ The Province should consider more emphasis on Licenses of Occupation for within the watershed. → Consideration must be given towards a compliance and enforcement-based model in-lieu of direct government intervention. → Information must be shared, including databases and time series data.	→ Use the Mill Creek Project elements as examples of developing technical working parameters and standards with ONA. → Replace the word stakeholders with a more respectable word. ▪ Partners? → More emphasis is needed for community education and empowerment.	→ Work needs to proceed on interconnection opportunities between the Improvement Districts and the City. → A goal must be a partnership with Province on Water Security. → Build public and agency awareness to water security, and determine common interests.	→ Develop a leadership framework where partners work together and collaborate on grant opportunities. → Assure that shovel-ready projects are available to leverage grant opportunities. → Work with the province to access upcoming Watershed Security Funds to help with partnerships and coordination. → Assure that climate resiliency and indigenous partnerships are incorporated. .

APPENDIX C

Engagement Summary

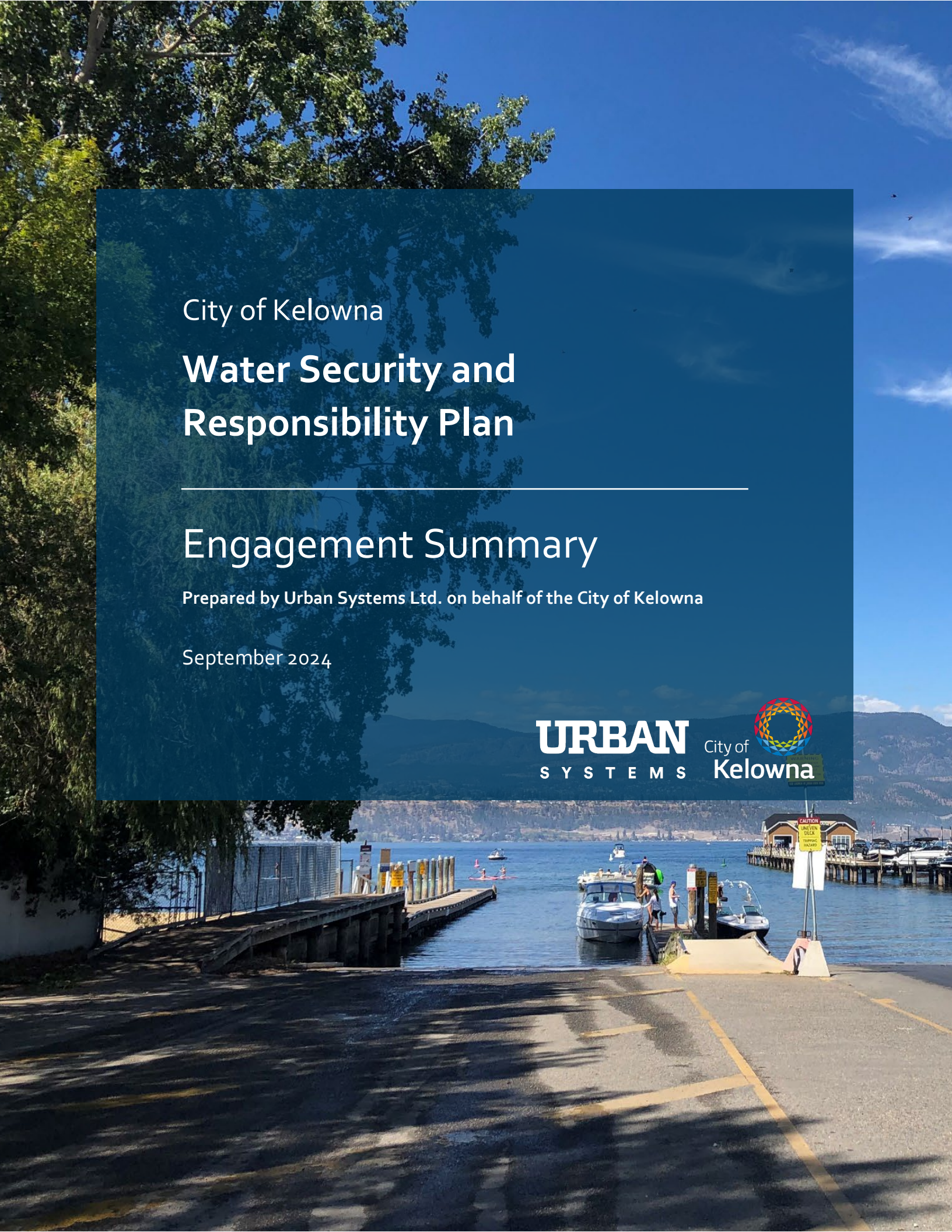
City of Kelowna

Water Security and Responsibility Plan

Engagement Summary

Prepared by Urban Systems Ltd. on behalf of the City of Kelowna

September 2024



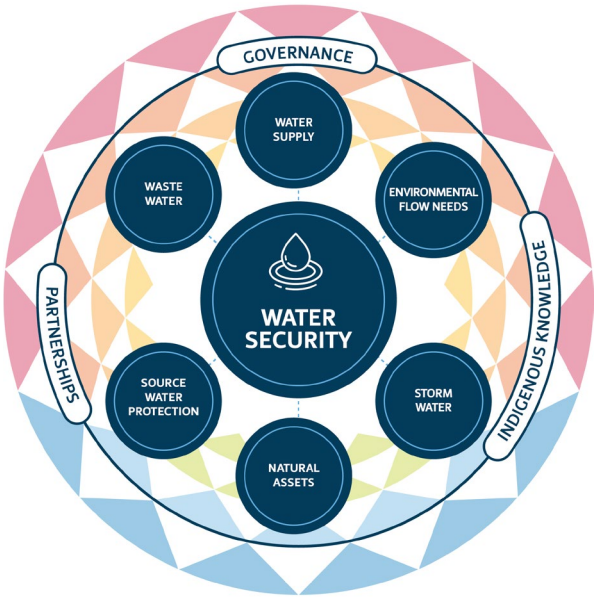
INTRODUCTION

The City of Kelowna is developing its first **Water Security and Responsibility Plan,** which will be a comprehensive strategy that lays out a path forward to ensure that Kelowna takes a holistic approach to using, protecting and sharing water.

The Plan is based on two concepts:

- The shared **responsibility** of the City, residents, visitors, neighbouring communities, and partners have in protecting water in the Central Okanagan for now and future generations.
- The need to ensure long-term **security** of water amidst a changing climate and growing population.

In June 2024, members of the public and key partners in water security and responsibility were presented with the draft Water Security and Responsibility Plan and asked to provide feedback on key components of the plan, including the **vision statement, guiding principles,** and **sectors of water responsibility**.



ENGAGEMENT OVERVIEW

Survey open on the City of Kelowna's Get Involved platform from **June 6 to 28, 2024.**

1,260 page visitors

137 survey respondents

14 information session attendees

76% of survey respondents supported the draft Plan's vision

92% of survey respondents agreed that water should be a key consideration in the City's decision-making.

KEY FINDINGS

Overall takeaways

- Participants in this public engagement process are supportive of a water security and responsibility plan and having the City place a greater focus on protecting water in decision-making at the Council level,
- Key priorities include protecting Kelowna's **water supply,** ensuring Kelowna continues to have enough **clean, healthy water**, and the need for individuals to take **responsibility for water conservation**. This aligns with the reasons participants were interested in taking the survey, which were primarily health, recreational or environmental concerns.
- Participants in the process have some concerns: this includes around residential water conversation, whether our present-day infrastructure can meet the City' rate of growth and development and whether there is enough redundancy and resiliency in our systems to provide water-based services in the event of an emergency.

Community understanding of water security and responsibility

Based on input from the survey respondents, the following definitions have been drafted for water security and water responsibility. These definitions will be integrated into the final Water Security and Responsibility Plan and used to communicate why the City of Kelowna is focusing on these two elements in future water-related decisions.

Water Security: Kelowna's water sources are effectively protected so that the residents and ecosystems in Kelowna have access to clean, safe, healthy and adequate water now and in the future.

Water Responsibility: All residents, businesses and industries are conscientious about how water is used in Kelowna to ensure there is enough water for everyone. This includes not being wasteful, using water in environmentally safe ways, preventing contamination and planning for the future.

Vision Statement

- The draft vision statement is supported by more than **three-quarters** (76%) of survey respondents. This suggests that it was easy to understand and that it resonates with the community.
- Potential areas of improvement include an emphasis on **water conservation**, protection of water in decisions related to **growth and development**, and use clear, simple and **plain language**.

Guiding Principles

- Survey respondents indicate that they resonate most with water supply, providing responsible wastewater treatment services and protecting our natural source water supply.
- The top three most important guiding principles for respondents reflect a focus on protecting Okanagan Lake and ensuring a reliable and high-quality water supply. Understanding the

community's values related to water security and responsibility can help the City prioritize investments and initiatives relate to these areas:

1. All residents and water users in the City have a **safe, affordable, resilient and sustainable supply** of high-quality drinking water and a reliable supply of water for agriculture
2. Protect Okanagan Lake, our human health, and our environment through **efficient collection and effective treatment of wastewater**.
3. Okanagan Lake and upland watersheds remain a source of **high-quality water**.

Water Sectors

- **Water supply (46%), water protection (29%) and natural systems (15%)** are the most important sectors for respondents. This suggests that the City's continued focus on these areas are important for the community.

HOW WE ENGAGED

The draft Water Security and Responsibility Plan and an overview of the Plan was posted on the City of Kelowna's Get Involved platform in June 2024. Community members were invited to provide feedback on the Plan in the following ways:

- An **online survey:** open from June 6 to June 28, 2024
- A **question submission form:** open from June 6 to June 28, 2024
- An in-person **regional partner session** held on June 20, 2024
- An in-person **public information session** held on June 20, 2024

Feedback on the draft Plan and key elements of the plan was primarily received through the online survey. The findings from the survey, public information session and question submission form are described in detail below.

Limitations

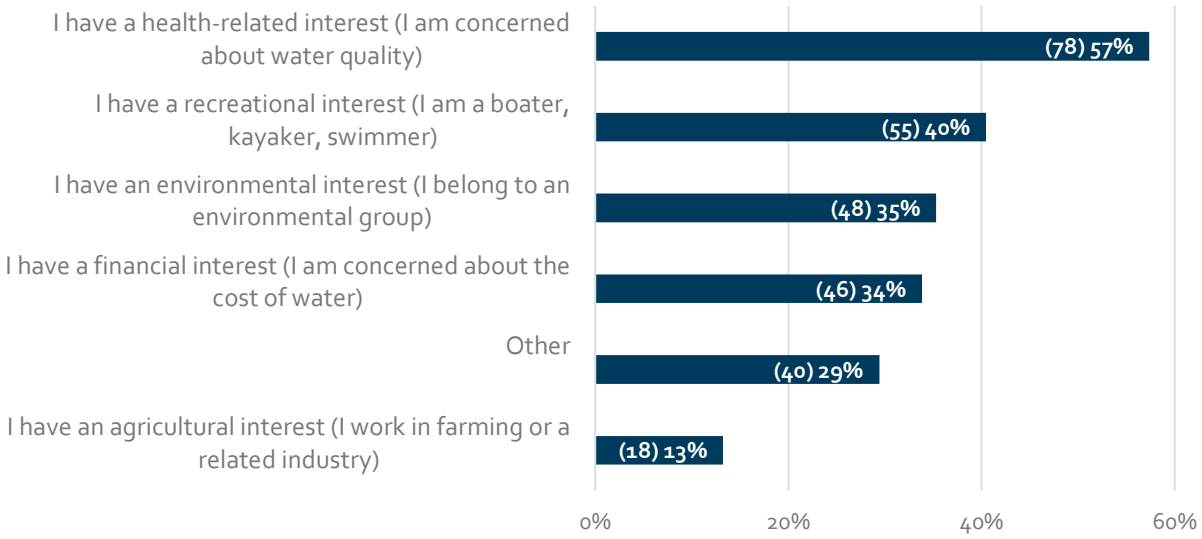
Owing to the opt-in nature of the feedback opportunities provided, feedback received may not be balanced or broadly representative. Additionally, promotional channels may be limited in their demographic reach with audiences comprised largely of homeowners, people who are online and older residents.

WHAT WE HEARD – SURVEY RESULTS

About the respondents

Residents were asked to describe their interest in the subject presented. The highest percentage of respondents (57%) are interested in the project because of water quality and health-related reasons, followed by respondents with a recreational interest (40%) and those with an environmental interest (36%). Over one-third of respondents indicated they are concerned about the cost of water (34%), while 29% of respondents selected "Other" and provided their own answer. Approximately 13% of survey respondents said they work in farming or another agricultural-related industry.

Which of the following describes you and your interest in this subject? Select all that apply. *(n = 136)*



"Other" comments indicated additional reasons for being interested in the project such as:

- Job-related interests (strata manager, water utility employee, developer)
- Engineering interests
- Civic interests (residents, concerns about water resources)
- Cultural interests (Indigenous lens)
- Personal interests (gardener, other environmental concerns)

Differing views and feedback from interest groups

Throughout this report, areas are noted where the responses from different interest groups differed largely from the average responses from all participants. These insights were gathered through cross-tabulation of available data.

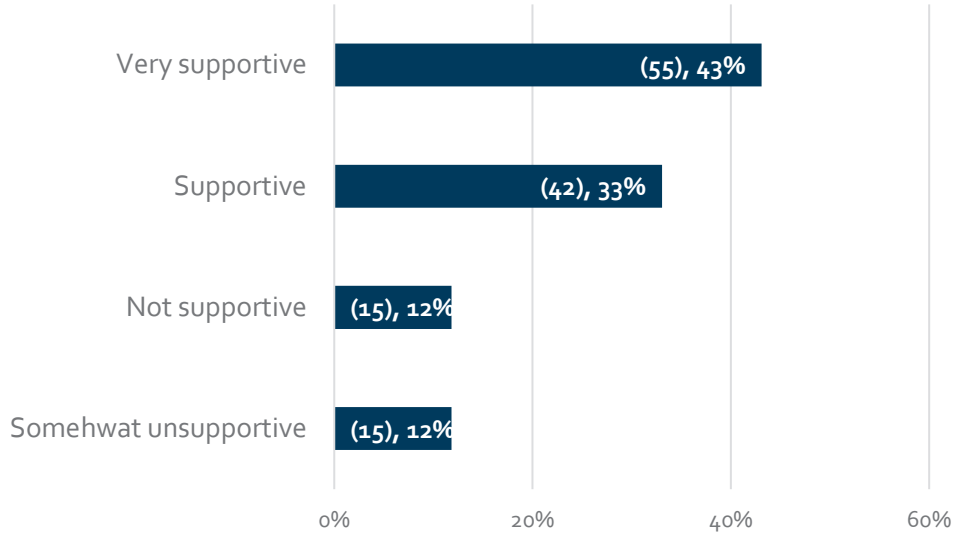
Vision Statement

Participants were asked to share feedback on the draft vision statement.

> Water management in Kelowna is approached from a holistic, "one water," lens that guides decision-making and long-term planning, reflecting the importance of water for our communities and for our environment.

Over three-quarters of survey respondents (76%) indicated they were **supportive or very supportive** of the vision, while the remaining respondents indicated they were somewhat unsupportive (12%) or unsupportive (12%).

How supportive are you of this vision? *(n = 127)*



How might the vision be improved? *(n = 69)*

This open-ended question asked respondents to suggest improvements to the draft vision. The following themes emerged:

- **Importance of water conservation:** Several respondents suggested that the draft vision place a greater focus on water conservation and its effect on water management. They mentioned that the vision should have more urgent and action-oriented language around reducing water usage across residential, recreation and other non-essential uses. *(17 mentions)*
- **Growth and development:** Survey respondents raised concerns about the vision in relation to Kelowna's recent growth and development. These respondents urged the City to adopt a vision that prioritizes water protection amidst growing residential demand. For example, respondents suggested placing limitations to new construction for things like pools, water features, cosmetic lawns, and non-native plant species (e.g. cedar hedges). *(10 mentions)*
- **Make the vision clearer:** There were several suggestions to clarify the draft vision. Particularly, respondents mentioned that "holistic" and "one water" were concepts that need clarification. Without prior explanation, those terms were considered difficult to interpret. *(8 mentions)*

- **Make the vision simpler**: Other respondents mentioned that the vision could be reframed in a simpler, people-centred way. They suggested that the vision might have a greater impact for the reader if it is personal and reflects the importance of water for our people, food and environment. *(5 mentions)*.

The following potential draft revised vision statement based on this feedback could incorporate these elements in the final Water Security and Responsibility Plan:

> All decision-making and long-term planning in Kelowna prioritize water security and reflect the interconnectedness of our communities and water systems to ensure water is used responsibly, and we have enough water for our people and environment as Kelowna grows.

Level of support for vision statement from respondents with environmental and financial interests

Support from financial interest group (concerned with the cost of water)

Compared to the average level of support from survey participants, respondents with a financial interest had much **lower levels of support** for the vision. Twenty-nine per cent (29%) of respondents with a financial interest strongly support the vision statement, and 24% of respondents with a financial interest were not supportive.

The majority of comments from these participants who did not support the vision statement felt that it should focus more on **water conservation** and educating the public about how to use water more responsibly. These participants also felt that water rates for individual users should be kept reasonable but at a point where people are incentivized to be more careful about their water use.

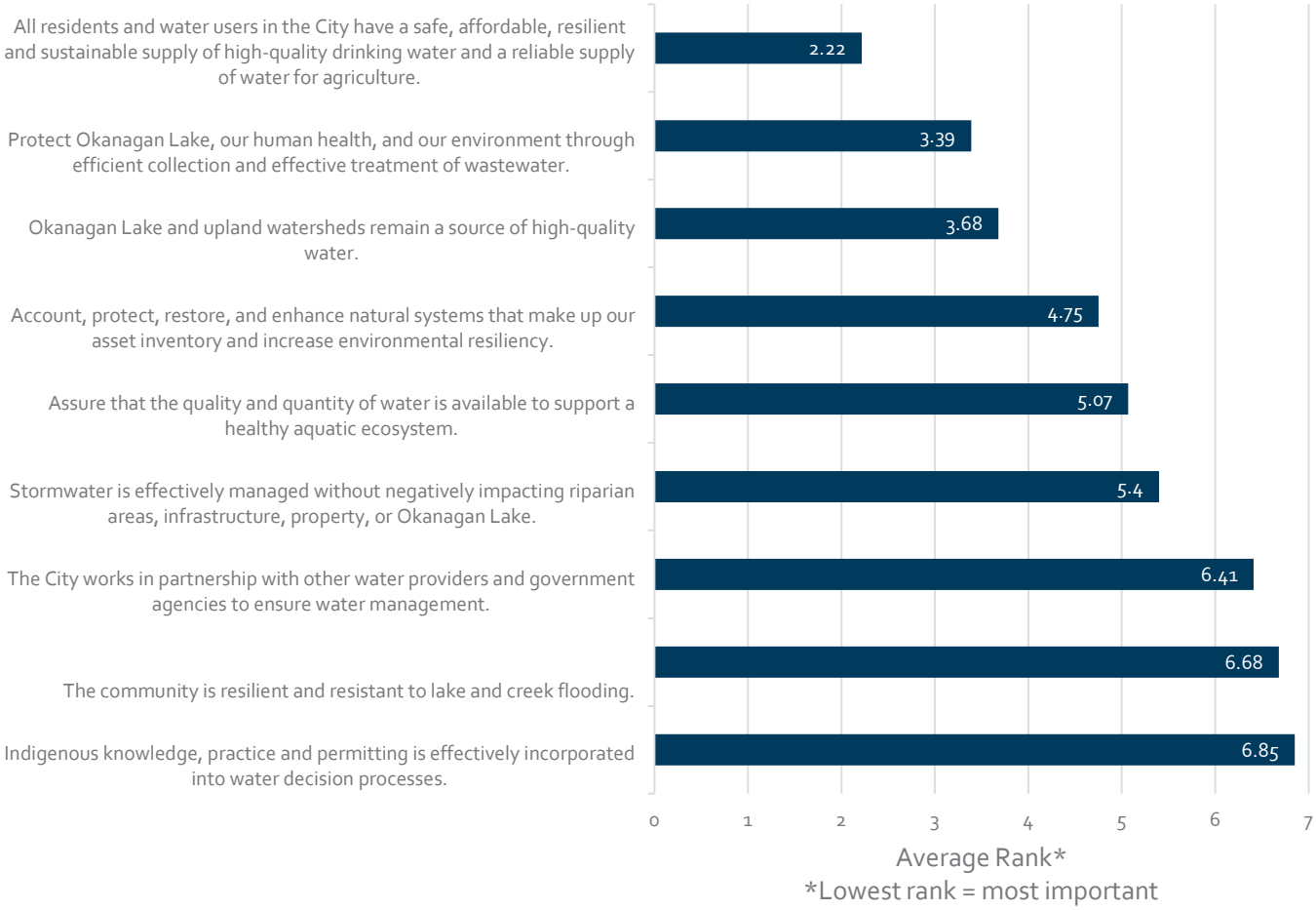
Support from environmental interest group

Alternatively, respondents with an environmental interest were more supportive of the vision statement than the total average. For this group, 65% of participants were very supportive of the vision statement and only 5% were not supportive of the vision statements.

Guiding Principles

Nine guiding principles were endorsed by Council in February 2023 to help guide the priorities and actions of the Water Security and Responsibility Plan. Participants were asked to rank the importance of each of the principles. Almost two-thirds of survey respondents (62%) chose the same option as most important to them: *"All residents and water users in the City have a safe, affordable, resilient and sustainable supply of high-quality drinking water and a reliable supply of water for agriculture."*

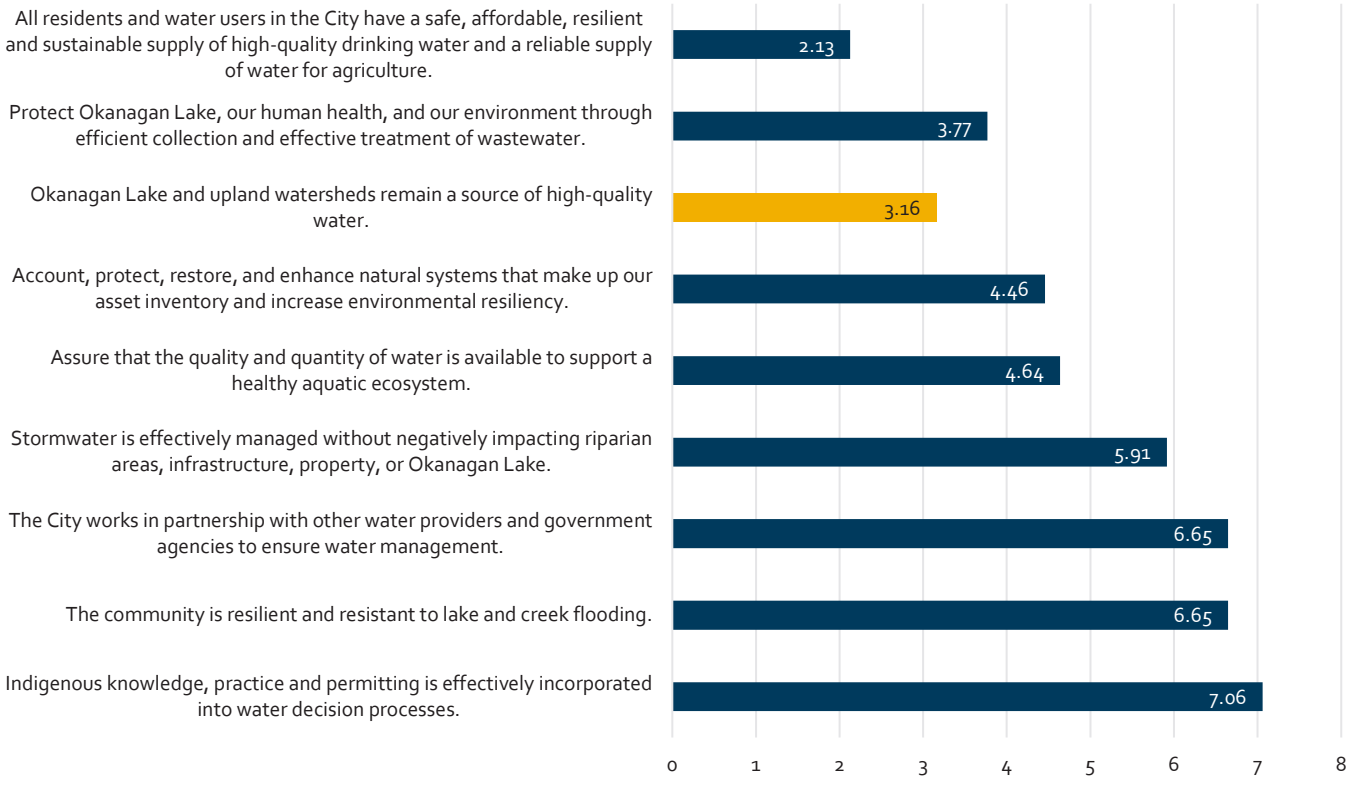
Rank the following guiding principles by selecting them in order of importance. (1 = most important) *(n = 122)*



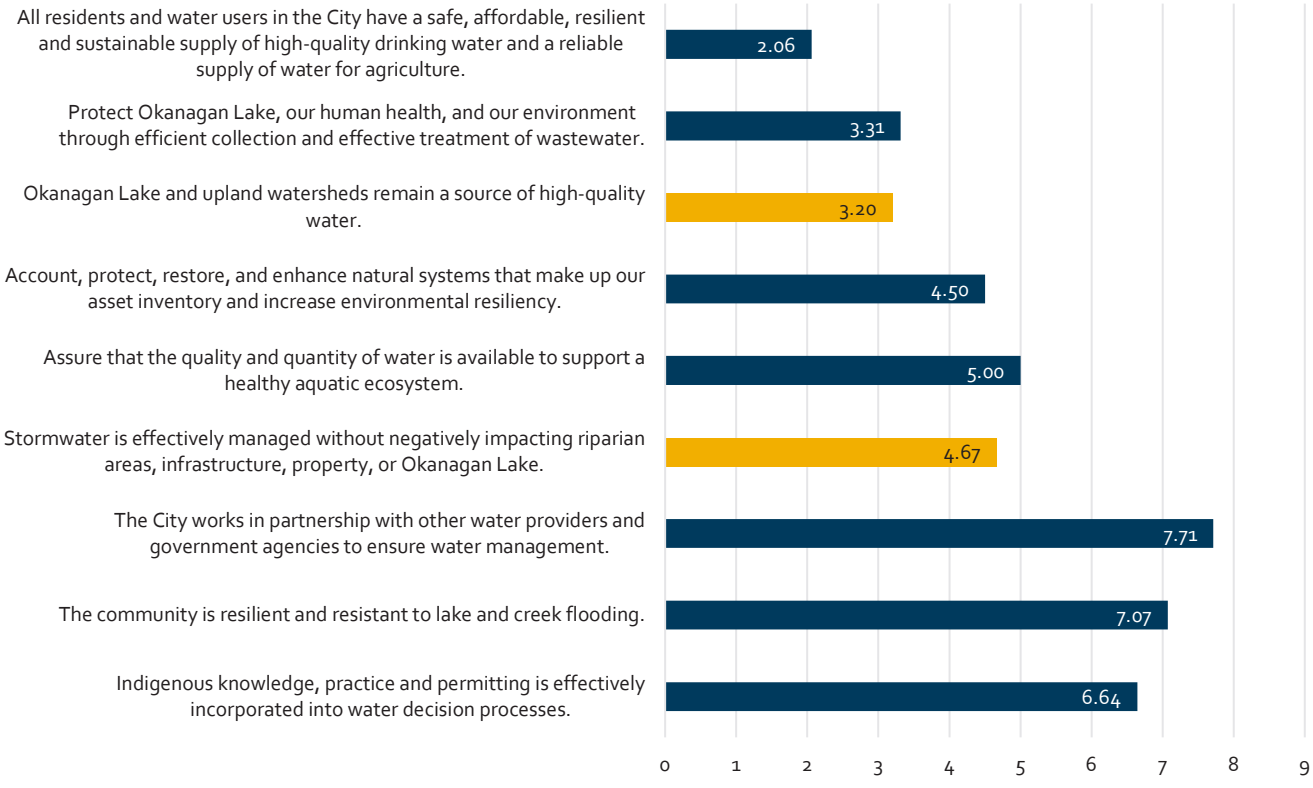
Most important guiding principles for respondents with an environmental or agricultural interest

Respondents that indicated that they have an environmental interest in water security and responsibility or have an agricultural interest ranked the importance of the guiding principles slightly different than the rest of respondents. Most notably, both groups ranked "Okanagan Lake and upland watersheds remain a source of high-quality water" as the second most important principle. Participants with an agricultural interest felt that "stormwater is effectively managed without negatively impacting riparian areas, infrastructure, property or Okanagan Lake" was on average more important total participants.

Guiding principle rankings from participants with an environmental interest (1 = most important) *(n = 47)*



Guiding principle rankings from participants with an agricultural interest (1 = most important) *(n = 18)*



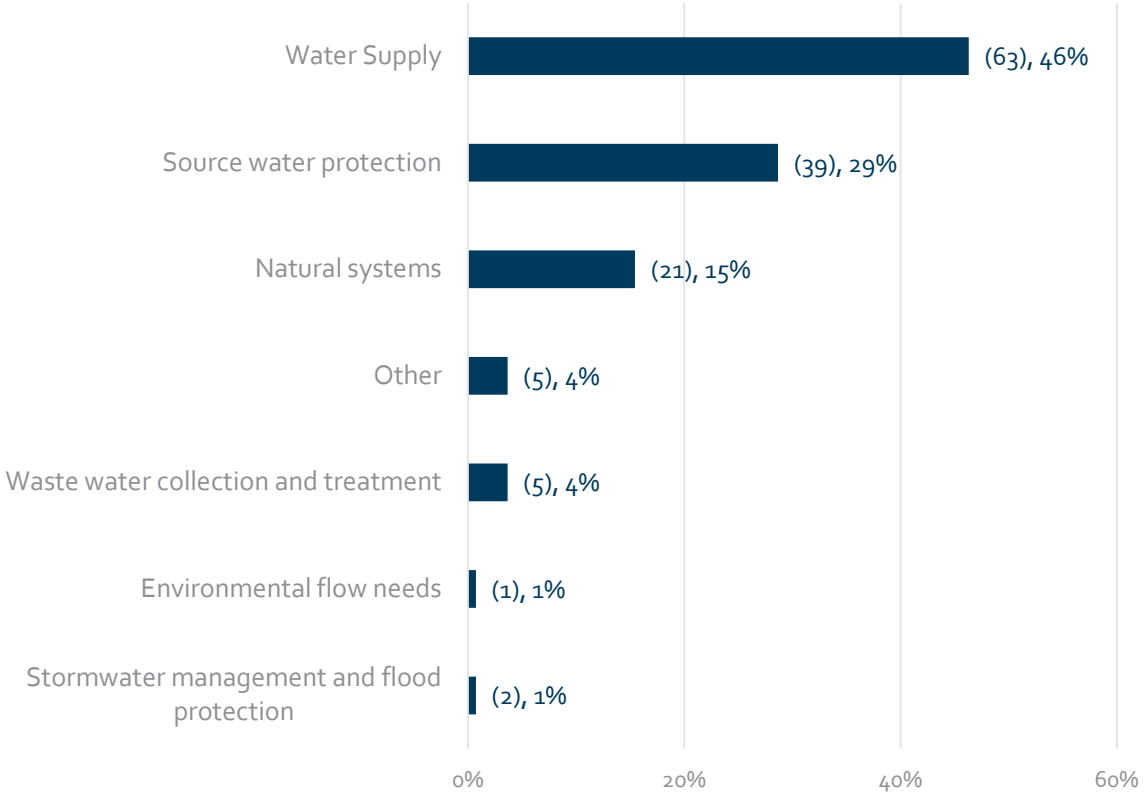
Key Sectors

The Water Security and Responsibility Plan outlines actions to improve responsibility and security related to six key sectors of water management:

- Water supply
- Environmental Flow Needs
- Stormwater & flood protection
- Natural systems
- Source water protection
- Wastewater

Participants were asked to share and provide comments on the sector that was most important to them. Almost half of respondents (46%) indicated that water supply was top of mind for them, followed by source water protection (29%) and then natural systems (15%). The rest of the options comprise the remaining 10%, and respondents who answered "Other" (4%) indicated other priorities such as waste water planning and human-made systems.

Which of these is top of mind for you? *(n = 136)*



Please explain your answer. *(n = 84)*
When asked to explain their reasoning for the previous selection, respondents answered under the following top themes:

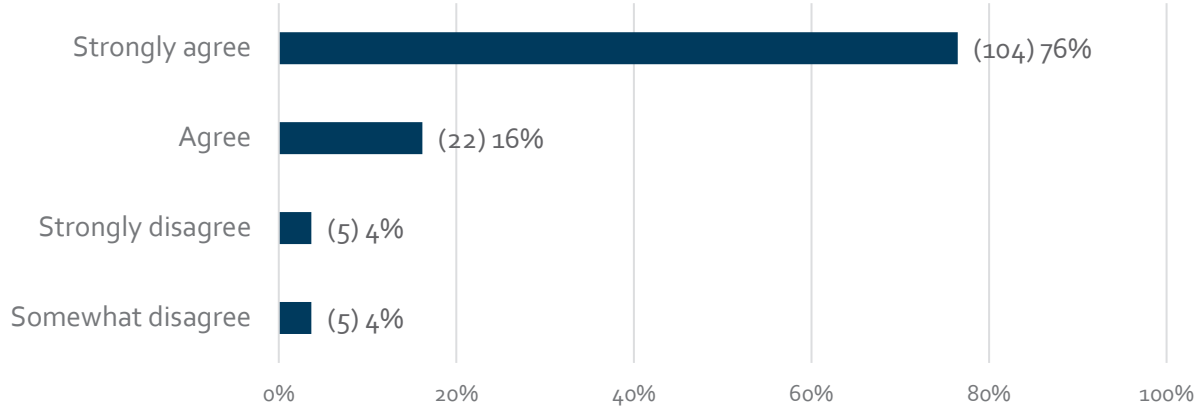
- **Source water protection:** Respondents emphasized the importance of protecting water sources. Without any access to a clean water source, all other water management efforts become irrelevant. They expressed that this reasoning should guide the City's approach to actions and decision-making. *(28 mentions)*
- **Community needs:** The City cannot function without an adequate and reliable water supply for its community. Respondents acknowledged that the City's role in providing water, treatment and infrastructure is essential for survival and quality of life in Kelowna. *(25 mentions)*
- **Water is life:** Respondents expressed that without water, there is no life. Careful management of water sources, natural systems and water treatment encourages responsible use for all living things in the ecosystem. *(18 mentions)*

General Feedback

Participants were asked to share their reflections on the importance of water security and responsibility and what each of these concepts mean to them, as well as provide general feedback on the Water Security and Responsibility Plan.

The majority of respondents (92%) indicated they agreed or strongly agreed that water security should be a key consideration in the City's decision-making and planning. The remaining respondents somewhat disagreed (4%) or strongly disagreed (4%) with the same statement.

How strongly do you agree with the following statement: Water security and responsibility should be a key consideration in the City's planning and decision-making. *(n = 136)*



Please explain your answer. *(n = 79)*
Respondents provided reasoning for their previous selection under the following top themes:

- **Importance of water:** Respondents agreeing with the statement emphasized that water availability impacts all of facets of life, including public health, agriculture, cultural value and recreation, so it makes sense for the City to consider water in its planning and decision-making. *(25 mentions)*
- **Community trust:** Survey respondents shared that residents rely on the City to take accountability surrounding water use decisions. Kelowna and its partners need to be responsible for protecting the lake and environment for future generations. *(10 mentions)*
- **Accounting for growth:** As more people come to the Okanagan Valley to live, work and recreate, the importance of water management increases. *(9 mentions)*
- **Agriculture and food production:** Water supply, quality and management impacts the region's ability to produce food and sustain our agricultural activities. *(9 mentions)*
- **A limited resource:** Respondents urged that water is a limited resource that requires protection through sustainable practices and responsible use. *(9 mentions)*

Level of agreement from respondents with a financial interest (concerned with the cost of water)
Participants with a financial interest were the most supportive of this statement, with 82% of those respondents saying they strongly supported water security and responsibility being a key consideration in the City's planning and decision-making. The reasoning these respondents provided included:

- Safe and reliable water and sewer systems is **fundamental service** for a municipality
- The City needs to plan ahead to accommodate **population growth**
- Access to water is an **economic driver** for tourism and agriculture
- Using water responsibly now can **save money in the future**

Community understanding of water security and responsibility

Residents were also asked to describe '**water security'** and '**water responsibility'** in their own words. The following terms were frequently used in the responses:

Water security	Water responsibility
• Clean (30 mentions) • Safe (23 mentions) • Available / accessible (21 mentions) • Adequate / enough / sufficient (21 mentions) • For future generations (14 mentions) • Nature / ecosystems / environment (14 mentions) • Agriculture (13 mentions)	• Not being wasteful (25 mentions) • Environmentally safe (12 mentions) • Minimizing water use for lawns/landscaping (11 mentions) • Future generations (10 mentions) • No contamination (9 mentions) • Changing our behaviours to protect water (8 mentions)

Some of the answers provided by respondents are shown below:

What does "water security" mean to you? *(n = 111)*

- That every citizen in Kelowna now and in the future has access to the water they need for drinking, eating, cleaning, growing and enjoyment.
- There is healthy and clean water available for future generations of both human life and all other beings
- Enough water to maintain a healthy ecosystem.
- Protecting our sources and quality of water.

What does "water responsibility" mean to you? *(n = 110)*

- To plan for the future and to protect the environment, and life with safe water and building practices.
- Valuing water, using water for beneficial reasons and making sure there is enough for environmental needs (not just humans)
- Reducing water usage, change landscaping to use native drought tolerant plants.
- Making hard decisions now to change mindset around water, to see it as a Sacred living being and protect water ways

Do you have any thoughts or comments about the Water Security & Responsibility Plan as a whole that you would like to share? *(n = 76)*

The following themes emerged:

- **Reducing water use:** Several respondents used this question to suggest ways for reducing water use. Respondents pointed to activities that are considered non-essential and water-intensive, including residential pools, water features, golf courses, and inefficient irrigation techniques. Respondents generally suggested some form of restriction or incentive to reduce usage across these activities. *(24 mentions)*
- **Growth and development:** Respondents expressed concern for the pace of development in the Okanagan and the City's ability to accommodate more water users. Given the region's semi-arid climate and risk of drought, these respondents urged the City to prioritize water security over unsustainable growth. *(14 mentions)*
- **Water rates:** Several respondents expressed that Kelowna's inexpensive water rates are impacting behaviours around usage. Respondents shared that if the City increased its water rates, especially to large water consumers, this would encourage more responsible use across the board. *(11 mentions)*
- **Residential lawns:** Respondents suggested that the City encourage water-efficient landscaping, such as xeriscaping, and to consider restrictions to green lawns and excessive watering.

ADDITIONAL FEEDBACK

Feedback from information session

Additional general feedback on the Plan received at the public information session included the need to balance new development with increasing demand for water, learn from challenges faced by other jurisdictions, and ensure that water infrastructure is planned well in advance to meet community needs. Some residents expressed frustration with increasing costs to deliver water-related services and many communicated that they feel the City's water is safe to use and consume.

Several information session participants referenced the City of Calgary's water main break and the impacts on that community. This sparked questions surroundeding water resiliency in Kelowna and whether a similar situation could happen here. The heightened level of public awareness about the importance of resiliency and reliability of water systems may draw attention to gaps between Kelowna's water purveyors and should be considered in future communications related to the Water Security and Responsibility Plan and related initiatives.

Feedback from online question submission

Six questions were received through the Get Involved project page that focused on the following topics:

- Clarity on what Indigenous knowledge and practices means and how this would be incorporated into the City's decision-making.
- Impacts of logging on water security and the reliance on trees to protect water sources.
- Incentives to reduce residential water consumption.

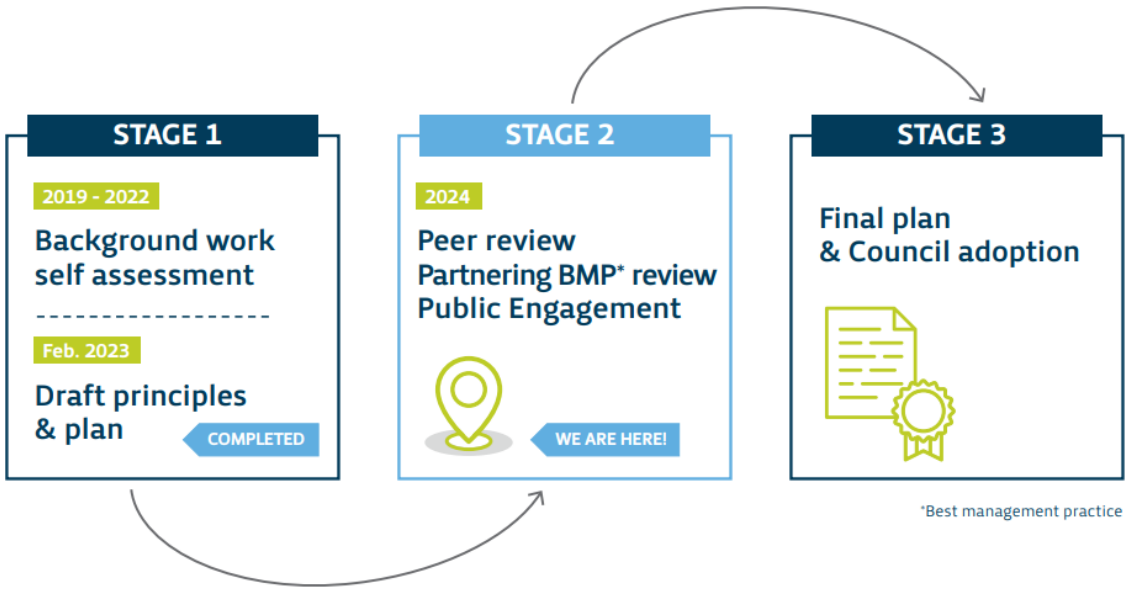
Feedback from written submissions

One written submission was received that shared concerns related to the impacts of climate change on water supply, combined with increasing demand for electricity generated from hydropower, leading to reduced availability of water to drink and grow food.

CONCLUSION & NEXT STEPS

The findings from this engagement program will be used to refine the draft Water Responsibility and Security Plan to ensure it reflects the community's priorities and values related to water. The final Plan will be presented to Council for adoption, and the actions outlined in the Plan will be implemented by the City, in collaboration with local First Nations, the Provincial Government, neighbouring municipalities, the Regional District of Central Okanagan and partner organizations.

Key input from community members that will be incorporated into the final Water Responsibility and Security Plan includes the definitions for **water security** and **water responsibility** based on survey responses, clarifying the vision statement, and placing greater emphasis on water conservation and balancing protection of water with population growth.

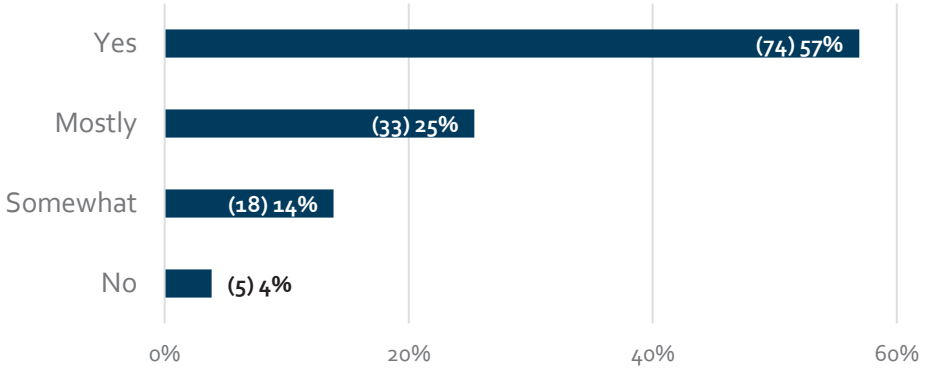


ENGAGEMENT FEEDBACK

Survey respondents were also invited to share feedback on the engagement process, including whether the draft Plan was easy to understand, if they learned anything new, their interest in the topic, and how they learned about the survey.

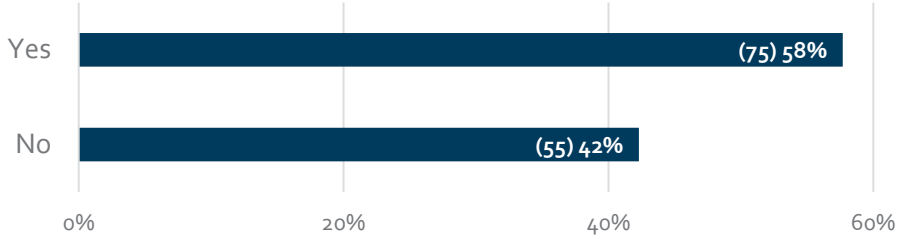
Was the information easy to understand? *(n = 130)*

Most survey respondents (82%) indicated that the plan's information was easy or mostly easy to understand. Approximately 14% of respondents indicated that the information was somewhat easy to understand, and the remaining 4% felt the information was not easy to understand.



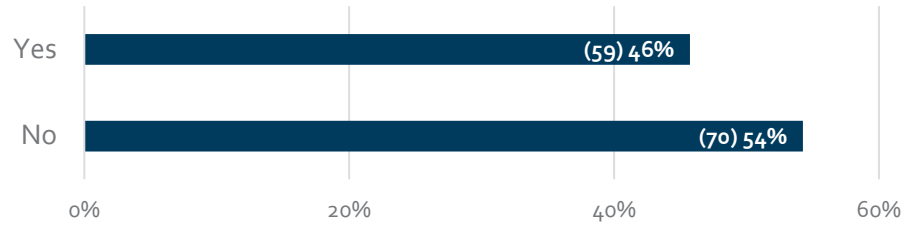
Do you understand how your input will be used? *(n = 130)*

Over half of respondents (58%) understand how their input will be used in this engagement process, while the remaining 42% indicated they do not.



Did you learn something new? *(n = 129)*

Almost half of respondents (46%) indicated that they learned something new from the survey, while the remaining 54% said they did not.



How did you hear about the survey? *(n = 132)*

Almost half of respondents (46%) heard about the survey from a local news article about the project, and over one-third (34%) heard about it through the City's media release. The rest of the respondents heard about the survey through social media (9%), word of mouth (8%) or through another way (3%). "Other" responses included the City of Kelowna website and other news articles.