COUNCIL REPORT

FLOOD MITIGATION STORAGE AREAS AS SNOW DUMPS

RECOMMENDATION

That the February 7, 2023, City Operations report CO01253, be received for information.

Requested Council Action		Information only	
ConnectEdmonton's Guiding Principle		**ConnectEdmonton Strategic Goals**	
CONNECTED		**Climate Resilience**	
City Plan Values	ACCESS. PRESERVE.		
City Plan Big City Move(s)	Greener as We Grow	**Relationship to Council's Strategic Priorities**	Mobility Network Climate adaptation and energy transition
Corporate Business Plan	Serving Edmontonians		
Council Policy, Program or Project Relationships	• Snow and Ice Control Policy C409K • Snow and Ice Control Administrative Procedure		
Related Council Discussions	• CO00778 Snow and Ice Control - Options to Increase Service Standards, Community and Public Services Committee, April 25, 2022 • CO01277 Snow and Ice Control - programmed Approach for the 2022-23 Winter Season, Community and Public Services Committee, June 27, 2022		

Previous Council/Committee Action

At the April 25, 2022, Community and Public Services Committee the following motion passed:

> That Administration consult with EPCOR to examine whether flood mitigation storage areas can also be used as snow dumps and provide a report back to Committee.

Executive Summary

- Maintaining dedicated, regulated snow storage sites represents a significant investment and commitment to environmental responsibility and sustainability, as well as a commitment to public health and safety.
- In consultation with EPCOR, Administration determined existing flood mitigation areas (FMAs), also known as stormwater management facilities (SWMFs), are not recommended for snow storage based on regulatory requirements as well as the environmental, health and safety factors involved with snow storage.
- Meltwater contains sand, salt and contaminants collected with the snow and poses risks to soil, groundwater and surface water depending on the discharge location. Impacts from meltwater are best mitigated by placement of snow on hard surfaces with meltwater settlement in an engineered settling pond.
- Existing SWMFs have unique engineered design features and functions to manage stormwater based on statistical storm data. SWMFs in Edmonton have not been designed to manage the quantity or quality of snowmelt runoff that would occur if snow removed from streets were to be piled and stored in those SWMFs.

REPORT

Background on Current Snow Storage Sites

In the winter, Snow and Ice Control (SNIC) crews may remove snow and haul it to one of four active snow storage sites owned and operated by the City of Edmonton. The City's fifth storage site is currently awaiting infrastructure upgrades prior to resuming operation. These four active sites are available for use by non-City users, including snow removal contractors, private businesses, landscape management businesses, neighbouring municipalities and the general public. Non-City users are responsible for an estimated 80 per cent of snow hauled to these sites. Edmonton's snow storage sites have capacity to manage the amount of snow that is currently removed from the roads each winter. Additional information on the history and operations of snow storage sites is included in Attachment 1.

Regulatory and Permitting Requirements for Snow Storage Sites

All snow storage sites are registered as a designated activity under Alberta's Environmental Protection and Enhancement Act. Meltwater contains sand, salt and contaminants collected with the snow, and poses risks to soil, groundwater and surface water depending on the discharge location. Administration is responsible for preventing and mitigating environmental impacts and meeting provincial and federal regulations, as well as routine monitoring and reporting, as part of site operations and regulatory commitments. Maintaining dedicated, regulated snow storage sites represents a significant investment and commitment to environmental responsibility and sustainability, as well as a commitment to public health and safety.

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Environmental monitoring and reporting are regulatory requirements for snow storage site management. Several municipal, provincial and federal environmental regulations and guidelines apply to Edmonton's snow storage sites and are summarized in Attachment 1, specifically:

- Alberta's *Environmental Protection and Enhancement Act* (EPEA) and the Snow Disposal Guidelines for the Province of Alberta
- Canadian Environmental Protection Act (CEPA) and the Code of Practice for the Environmental Management of Road Salts.

In accordance with these regulations, Administration also:

- Has a Salt Management Plan that addresses requirements from the Federal Code of Practice and is supported by administrative procedures and training;
- Follows ENVISO policies and procedures as a condition of snow disposal registration for
    - Environmental releases.
    - Snowmelt water monitoring and total suspended solids management procedure.
    - Exceedance notifications.

Requirements for Snow Storage Sites

Designated snow storage sites must be engineered to minimize environmental impacts. The specific measures required will depend on the risk and potential impacts for each site.

These measures can include:

- Containment structures and grading to direct meltwater into settling ponds and minimize the seepage of contaminants into groundwater.
- Hard paved surfaces to minimize percolation of contaminants into soil and groundwater and to reduce surface erosion with relatively impermeable site bases.
- Sufficient space and sun exposure that allow snow to completely melt between snow seasons.
- Pond discharge infrastructure that allows for control and flow regulation of meltwater to an approved drainage system or outflow.
- Constructed settling ponds of sufficient size to accommodate the amount of anticipated meltwater while suspended sediment is allowed to settle.
- Security features to prevent unwanted access and illegal dumping, and for public safety.

Any site that is considered for temporary or long-term snow storage would need to adhere to federal and provincial criteria and guidelines. Sites must be properly assessed and designed accordingly to ensure proper containment and drainage as well as environmental compliance. Attachment 2 provides a flow diagram overview of what regulations and considerations are needed for development and design of a new site.

Meltwater from snow disposal can create a contaminated site through groundwater and soil impacts, and meltwater discharge to surface waters can exceed Alberta Environment and Protected Areas and EPCOR water quality limits. Impacts from meltwater are best mitigated by placement of snow on hard surfaces with meltwater settlement in an engineered settling pond. Attachment 2 provides an initial examination of other options, environmental and safety risks,

monitoring considerations, and benefits associated with different site types. Additional work would be required to fully assess each potential option.

Potential Use of Current Flood Mitigation Areas as Snow Storage Sites

In consultation with EPCOR, Administration determined that using existing Flood Mitigation Areas (FMAs), also known as SWMFs, for snow storage is not recommended (Attachment 3). This is based on the regulatory requirements as well as the environmental, health and safety factors involved with snow storage.

Existing SWMFs have unique engineered design features and functions to manage stormwater and snowmelt from the immediate surrounding upland areas, based on statistical data. They have not been designed to manage the quantity or quality of snowmelt runoff that would occur if snow removed from streets were to be piled and stored in those SWMFs.

Provincial and federal guidelines and environmental regulations apply to snow storage and snowmelt management at any location, including areas that are not designated snow storage sites. Concerns and issues that could arise if snow were to be stored within an existing SWMF include:

- High levels of salt, traction materials and contaminants within snow may not be easy to filter or manage, which could affect SWMF drainage functions as well as accumulate in certain areas, such as on dry pond surfaces and in underground storage tanks.
- Salts and contaminants could easily disrupt ecological functions and negatively affect the quality of surface water, groundwater and surrounding vegetation.
- Heavy snow moving equipment could cause physical damage to SWMFs and surrounding vegetation and infrastructure.
- Health and safety hazards for the public and animals when snow is stored in areas within or adjacent to residential, recreational and natural areas.
- Volumes of meltwater and traction materials may be greater than drainage systems are capable of handling.
- Public concerns and complaints regarding movement of heavy snow hauling equipment as well as noise volumes for any SWMFs located within or near communities with residential housing.

Considerations for Use of Future Flood Mitigation Areas

If SWMFs were to be used for snow storage, they would need to be designed and engineered accordingly to ensure that such sites have sufficient storage capacity, and that environmental and public concerns could be addressed and managed according to municipal, provincial and federal regulations. This would require a long-term strategy and plan, including feasibility studies, extensive public and stakeholder consultation and negotiation with regulatory bodies.

Design of a dual-use site may require the following features:

- A method to melt snow, funneling meltwater directly underground.
- The ability to accommodate heavy snow moving equipment, such as a hard-paved surface, such as a parking lot.
- A means to filter abrasives and other contaminants and the ability to capture and dispose of the sediments.

- Connection to an underground storage tank and the sanitary drainage system.
- Safety precautions and site access control features to prevent public access to contaminated snow and melters, and to restrict access to authorized personnel and vehicles only.
- Risk assessment of storage and transportation of fuel type, volume and transportation, heat and noise impacts, and air emissions with snow melter generators.

The costs and tradeoffs of this type of site selection and site design will be significant, and would need to be determined through further analyses if such direction is provided.

There is an ongoing requirement to operate and maintain the current dedicated snow storage sites to ensure appropriate environmental management of contaminated snow, even if temporary snow storage sites or dual-purpose SWMFs are developed in the future. Administration's priority is to ensure that the identified high-priority snow storage site upgrades are completed as soon as capital funding becomes available. These priority upgrades will ensure sites have sufficient storage capacity as well as long-term environmental compliance and sustainability that are required for effective snow management. Moreover, planned capital upgrades to existing snow storage sites may be a source of future revenue through tipping fees.

Legal Implications

Snow storage and the risks associated with it exist within a complex regulatory framework, involving both provincial and federal legislation. Snow meltwater carries a number of substances that if improperly released could constitute a 'release into the environment', which can create both immediate and long-term environmental harm and therefore, carries regulatory liability which can include significant fines and penalties. For this reason, Snow Storage is a designated activity under the *Environmental Protection And Enhancement Act*, RSA 2000 c. E-12 and requires proper site design, operation and management.

COMMUNITY INSIGHT

Administration consulted with EPCOR representatives regarding the potential use of current and future flood mitigation areas for snow storage. They provided a summary of their analysis and findings in Attachment 3. The key findings from EPCOR's report were used to help inform the overall report.

Any additional direction regarding the development of community based snow storage sites in the future, assuming that these sites meet the necessary regulatory criteria, would require an extensive public and stakeholder consultation process in addition to consultation with the required regulators in order to determine project feasibility.

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Use of current or future flood mitigation areas for snow management would require further navigation of health and safety regulations to ensure any impacts on residents support healthy communities. Additionally:

- Any proposed changes to site locations would require a geographic review to ensure safe and equitable distribution throughout Edmonton.

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- A full impact analysis with public consultation would be required to determine how neighbourhoods and residents would be affected, particularly by noise and emissions, and to provide opportunities for residents and stakeholders to provide input on any plans.
- A full equity analysis would need to be conducted to investigate and assess drainage systems in neighbourhoods to ensure those who live in older neighbourhoods are not disproportionately impacted by additional volumes of meltwater being added to local drains.

ATTACHMENTS

1. Background and Operational Summary of City of Edmonton's Snow Storage Sites
2. Snow Storage Site Criteria and Considerations for Developing New Sites
3. EPCOR Report: Snow Management Discussion