SNOW AND ICE CONROL PLAN

2018/2019

October 2018

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Disclaimer

This plan is based on normal winter weather conditions, availability of personnel and reliability of equipment. The Town does not guarantee a level of service under abnormal or extreme winter conditions nor in the event of a work stoppage.

1.0 GENERAL INFORMATION

Town of Riverview, the largest Town in New Brunswick, is home to more than 20,000 citizens. The Town maintains approximately 127 km of road, 37 km of concrete sidewalk, and approximately 15 km of trails. Roads and sidewalks are maintained free of snow and ice by plowing and the application of salt. Some trails are removed of snow and a sand/salt mixture is applied to control icing conditions and to provide traction.

Riverview uses road salt as the de-icing chemical of choice because of its relatively low cost of supply and effectiveness based on our climate. Riverview has been proactive in implementing ways to reduce the amount of salt application. In 1995, regulators were installed on all of the Town's sanding and salting equipment. The electronic controls are set to deliver precise amounts of sanding and salting product and are calibrated regularly. In 2002, select trucks were equipped with brine tanks and controls for pre-wetting. The success of this exercise warranted the installation of this equipment on all remaining trucks. By fall of 2004, all of The Town's sanding and salting equipment were equipped with brine tanks and controls for pre-wetting.

Prior to 2009, the Town’s average yearly salt usage was approximately 3,500 Metric Tonnes. Currently the Town uses approximately 2,200 to 2,500 Metric Tonnes of salt. However, this quantity is obviously dependant on yearly winter conditions. Staff training on salt application is also provided to new employees. In 2005, the Town had taken steps to monitor salt consumption, this technology has now become out of date and we are exploring new technologies and methods of salt reduction.

Other notable changes throughout the years are the change to one-man plow operation in 2007, this better positioned the Town to more effectively manage its manpower when faced with long winter storm. Also, in 2009, Council agreed to remove the bare street policy on level 3 streets.

2.0 WINTER MAINTENANCE POLICIES

2.1 Purpose

To provide an effective and efficient level of service for snow and ice control in the Town of Riverview and to ensure that this level of service is well understood by operators, supervisors, senior staff, Town Council and the public.

2.2 Mission

To provide a consistent level of snow and ice control in the Town of Riverview.

2.3 Policy

The Town of Riverview provides snow removal and ice control on town streets and sidewalks according to pre-established priorities. Streets are prioritized based on their importance in the overall transportation network.

Critical Areas Major intersections, hills, and bridge decks.
Level 1 Streets are arterial and heavily travelled collector streets.
Level 2 Streets are collectors and some heavily travelled local streets.
Level 3 Streets are typically local streets.

Higher priority streets are serviced earlier in the storm response, and are given higher level of service.

3.0 RESPONSIBILITIES

- The Superintendent of the public works division is responsible to the Director of the engineering & public works department, for the level of services to the community with regards snow and ice control in the Town of Riverview.

- The superintendent or his designate is responsible for ensuring the winter storm response is in accordance with this **Snow and Ice Control Plan**. The superintendent, along with his foremen, will be familiar with this plan and will conduct winter maintenance tasks to achieve and maintain safe driving and ease of traffic flow.

- The general procedures followed will be in accordance with established procedures.

    1) Critical Areas - Major intersections, hills, and bridge decks.
    2) Level 1 - Arterials and Collector Primary
    3) Level 2 - Bus Routes & Collector Minor
    4) Level 3 - Local & Residential Streets

- Note: It is understood that not all residents can live on a priority one street but they probably drive on one. It is to everyone's benefit that these high volume streets are serviced first.

- Evening and night crews play a critical role in storm response. While they ensure the **Snow and Ice Control Plan** is followed, they are expected to exercise judgment and respond to changing conditions.

4.0 SNOW REMOVAL LEVEL OF SERVICE

4.1 STREETS

Service Level	Roadway Type	Description
Critical Areas	Major intersections / Hills / Bridges	• Start salting at the beginning of the storm • Plowing will start once slush begins to form. • Normally plowed to bare pavement, curb to curb, within 4 hours after storm ends. • Streets are salted within 6 hours after storm.*
Level 1	Arterial & Collector Major	• Start salting at the beginning of the snowstorm. • Plowing will start once slush begins to form. • Normally plowed to bare pavement, curb to curb, within 4 hours after storm ends.* • Streets are salted within 6 hours after storm.*
Level 2	Bus Routes & Collector Minor	• Start salting at the beginning of the snowstorm. • Plowing operations begin after 10 cm of snow. • Normally plowed to bare pavement, curb to curb, within 6 hours after storm ends.* • Streets are salted within 6 hours after storm.*
Level 3 *	Local / Residential Streets	• Plowing operations begin after 10 cm of snow. • Centerlines of streets are salted within 6 hours after storm.*

***Notes:**

1. The amount of snow received during each event and the type often varies (wet/heavy, dry/powder, and combinations of each) and this can either positively or negatively affect the times stated above.

2. The time above is based on a snowfall accumulation of up to 30 centimetres. For snowfalls above 30 centimetres, the objective is to clear the snow as soon as available equipment and personnel will allow.

3. The street classification map is provided in Appendix C.

4. The melting action of salt is more efficient on high traffic streets. Therefore, Level 3 streets with the same quantity of salt will not clear off as quickly as level 1 or level 2 streets.

5. Spreading salt on level 1 and 2 as the storm begins will eliminate the freezing of the first snowfall and reduces bonding of the fresh snow to the pavement. In many cases of light snowfall, this is all that is required.

6. Sand is rarely used on the paved streets as the road surface temperatures rarely drop below the levels of effectiveness for salt. However, when temperatures drop below these levels, the streets are sanded in the same manner, as they would have been salted. Sanding rates tend to be higher than salt because it is used as an abrasive rather than a de-icer.

7. During freezing rainstorms and when temperatures drop after a period of thawing, there are critical areas where vehicle movements become unsafe and sometimes impossible. These occur at major intersections, main routes, hills, bridges and runoff areas. These critical areas will be the first to be salted. In many instances these are the only areas, which require salting.

4.2 SIDEWALKS

The Public Works Department removes fallen snow along 37 km of sidewalks following a snowstorm according to the following priorities.

Level 1

1. Sidewalks near school zones
2. Sidewalks on heavily travelled arterial streets

Level 2

3. Sidewalks on less travelled arterial streets and collector streets

4. Remaining sidewalks

Level 3 – Not cleared

5. Small section on Irving Road without sidewalk connectivity.

See Appendix C for the Sidewalk Snow Clearing Map.

The objective is that all Level 1 sidewalks will be cleaned of snow within 12 hours from the end of the snowfall for snow storms up to 30 centimetres. When we receive larger snow accumulations, it may take as long as 24 hours depending on the type of snow (wet and heavy, powder, etc.), the previous accumulations, equipment and staff availability.

All sidewalks in Level 2 will be cleaned from snow after the sidewalks in Level 1 have been cleaned from snow. The objective is to complete the snow-clearing operations within 48 hours after the end of the snowstorm.

NOTE: It is not the Town's intention to have bare sidewalks during the entire winter season. Snow will be removed and sand provided to improve traction.

An abrasive sand/salt mix may be used on sidewalks to control icing conditions and provides a rough surface for the traction of pedestrians.

4.3 TRAILS

Some trails are looked after by the Parks & Recreation Department while other are maintained by public works. Trails included in the snow removal and ice control plan will be cleared within 48 hours following a snow storm include:

Parks & Recreation

- Pinder ext. Findlay to Lawson
- Pine Glen (Coverdale to Cross Creek)
- Gunningsville (Bridge to Pinder)
- Riverfront Trail (Causeway to Avondale)
- Sawgrass to Runneymeade

Public Works

- Mabel (Trites to Wilson)
- Old Coach to Gunningsville
- Canterbury to Page
- Bradford Pedway
- Hebron (McAllister to Pine Glen)

- Kasley Park
- Buckingham trails to RHS property

4.4 FIRE HYDRANT

Fire hydrants will be cleared of snow when snow prevents access to the front cap. The snow will be removed from all hydrants within 5 working days from storm ends. The operation will be completed based on following priority:

1. High risk buildings,
2. Coverdale, Hillsborough,
3. Seniors complex,
4. institutional (schools),
5. business district
6. Residential area

The Foremen on-call has authority to decide if the accumulation of snow warrants the clearing operation to be activated. The Superintend shall ensure the working Foremen is aware of their responsibility. The Fire Chief will have the final authority as to if and when clearing operations are required.

4.5 EQUIPMENT

The Town clears streets and sidewalks following a winter storm with the following equipment and 14 full time Operators and 4 foremen.

4.5.1 Street Plowing & Salting Equipment

- Two (2) Tandem Axle Plow Trucks - Equipped with salt spreaders (compu-spread 420) & brine tanks and used for plowing & salting operations.
- Five (5) 5 Ton Single Axle Plow Trucks - Equipped with salt spreaders (compu-spread 420) & brine tanks and used for plowing & salting operations.
- Two (2) Loaders - Equipped with wing & plows for plowing
- In addition to Town Equipment, we contract two (2) pieces of plowing equipment are used for plowing snow.
- Two (2) Loaders - Used for loading salt, pushing back corners & used for blowing snow with attachment

4.5.2 Sidewalk plowing

- Five (5) Trackless Sidewalk Blowers - Equipped with blowers, blades & sander for cleaning & sanding sidewalks & walking trails

Since 1995, Compu-spread regulators were installed on all of The Town's sanding and salting equipment. The electronic controls are set to deliver precise amounts of sanding and salting product and are calibrated regularly.

Picture 1 – 420 Compu-spread regulators

5.0 GENERAL SALT USE

Ground water, surface water, and soil can become polluted as the result of heavy and frequent applications of salt, but there are a lot of variables to consider when determining the extent of environmental damage. It is not accurate to state simply that putting salt on a road surface will invariably have a negative impact on the surrounding environment. The degree of damage largely depends on the type and designated use of the receiving water, and on the drainage system used to discharge the runoff.

5.1 Pre-treatment, Pre-wetting, anti-icing, RWIS, AVL/GPS

Pre-wetting is one technique where the salt is released from the truck and is sprayed with brine before being spread on the road. The moisture in the salt allows it to stick to the road, while penetrating through the ice and snow at the same time. This method greatly reduces the amount of salt needed. By pre-wetting the salt before it hits the road, it becomes more effective and reacts faster to snow and ice, reducing the overall amount of salt being used on streets by up to 20 percent depending on road surface temperatures.

Picture 2 – Brine Tank Mounted on Truck

In 2002, select trucks were equipped with brine tanks and controls for pre-wetting. The success of this exercise warranted the installation of this equipment on all remaining trucks. By fall of 2004, all of The Town's sanding and salting equipment were equipped with brine tanks and controls for pre-wetting.

5.2 Environmental Considerations

Groundwater contamination during general salt use in Town presents a low risk to the residents of Riverview since the Town serves 99% of the population with a municipal water distribution system. The impact outside of Riverview is again low since groundwater flow in the study area is anticipated to follow regional surface topography, towards the Petitcodiac River and/or one of its tributaries.

The impact of general salt use in Riverview to the municipal drinking water source is low to none since the Town's municipal drinking water source is located outside of Riverview in the Turtle Creek watershed, which is situated over 6km from Coverdale Road and 3.7km outside of Town limits, at an elevation above and outside of any influence of Riverview's urban development.

The effect of general salt use causing an increase in the level of pollution to the receiving surface water is low since until recently, all but three storm water outfalls discharge directly into the Petitcodiac River. The Petitcodiac River is a tidal river with a drainage area of over 2,000 km^2 and an average annual flow of 34.8 m^3/sec [1]. The other three outfalls are indirectly discharged into the Petitcodiac River via Grey's Brook and Mill Creek at Callowhill Road.

The Town has recognized certain areas within the Town that may be vulnerable to salt application. The municipal water distribution system has not been extended along Pine Glen Road from Pinewood intersection to the Town limits; a total distance of approx. 1.7km. A select number of homes in this area are on private wells. Although the area may be considered vulnerable, salt application is not reduced due to the poor condition of the road drainage and required level of service based on this street's designation. Pine Glen Road is a major route leading south and south-east outside of Town and is used by emergency vehicles.

A similar situation exists along Coverdale Road, where the municipal water distribution system has not been extended from Turtle Creek to the Town limits, representing a distance of 2.0 km. A select number of homes in this area are on private wells. However, the wells are located away from the road. Similar to Pine Glen Road, this road

[1] NBDOE (New Brunswick Department of Environment). 1984. Moncton Planning Region Water Resources Review. Water Resources Branch, Report I-8402.

is a major route leading west out of Town and is used by emergency vehicles. The winter road salt application is maintained based on this street's designation and required level of service.

Another sensitive area may exist alongside a public roads leading to two cattle farms off of Coverdale Road. Winter snow removal and vehicle access on this gravel road is maintained by the application of sand/salt abrasive mix only. In general, the impact to soil pollution as a result of general salt use in terms of soil use is low since there are no agricultural developments within the Town and very little soil cultivation.

Table 2 – General Salt Use

Type and amount of chloride freeze point depressant used (solids, liquids, and sand/salt mix or abrasive mix).	Road Salt: Average 2,200 tonnes/year @$79 for salt and delivery plus HST total **$185,000/year**
Type and amount of other de-icing or anti-icing treatment chemicals used.	None
Current application rate for each type of material.	Rock Salt: 84 - 225 Kg/Km
Percentage of fleet with pre-wetting.	100%
Percentage of fleet with liquid only applications.	0%
Percentage of fleet with electronic spreader controls.	100%
Number of road weather information systems (RWIS) installations.	None
Number of other surface temperature measuring devices (hand-held or vehicle mounted).	None
Use of dedicated pavement and/or atmospheric forecasting.	Weather network and Environment Canada Internet weather site.

5.3 Training Program

The Town is a member of the Transportation Association of Canada (TAC) and has recently employed their Syntheses of Best Practices as a reference to improve our salt management practices. Another important source of information is available through the American Public Works Association APWA. The Town endorses these associations' on-

going efforts in salt management and snow removal best practices by attending annual conferences, when possible.

The Town will often communicate with other municipalities to learn of other winter maintenance practices. This form of open dialogue is very efficient as on-going training and education for staff. New technologies that reduce salt consumption, while maintaining an acceptable level of service, may be researched and considered for use.