Elgin County
Progressive by Nature

SALT MANAGEMENT PLAN

September 2020

1.0 INTRODUCTION

1.1 Overview

The County of Elgin has approximately 700km of roads within the Corporation's jurisdiction. The County outsources road maintenance activities, including winter maintenance, to it's seven local municipal partners under formal agreement. In part, the agreement requires that Provincial Minimum Maintenance Standards (Ontario Regulation 239/02 and as amended by 366/18) are the standard to be met and each municipality has the flexibility to meet the standards as they deem best. The following local municipal partners (LMPs) are therefore responsible for winter maintenance on County of Elgin roads within their respective municipal boundaries:

Municipality of West Elgin

Municipality of Dutton/Dunwich

Township of Southwold

Municipality of Central Elgin

Town of Aylmer

Township of Malahide

Municipality of Bayham

Snow and ice control is a key part in keeping roads safe. Road salt (particularly sodium chloride) is the preferred de-icing / anti-icing chemical for maintaining winter roadway safety due to its cost, effectiveness, and ease of handling. The County of Elgin, like other road authorities utilizes road salt in order to fulfill its obligations under the Municipal Act and to maintain safe roads for the travelling public during the winter season.

In 2001, Environment Canada released an assessment report indicating that road salts are entering the environment in large amounts and posing a risk to plants, animals, birds, fish, lake and stream ecosystems and groundwater. The report recommended that salt be designated toxic under the Canadian Environment Protection Act (CEPA). Environment Canada has not banned the use of road salts, but have rather encouraged users to develop management strategies. It should be noted that Health Canada has stated that road salts are not harmful to humans.

In recognition of the adverse effects that excessive use of roads salt can have on the environment, this Salt Management Plan has been created with the goal of minimizing the amount of road salt entering the environment.

1.2 Purpose of the Salt Management Plan (SMP)

The SMP is intended to demonstrate the commitment of the seven local road authorities to reduce potential negative environmental effects by managing their road salt usage and to remain consistent with Environment Canada's stated objectives.

Road safety is of the utmost importance to the road authorities across Elgin County. Modifications to winter maintenance activities will be implemented in such a manner that balances the use of road salts while maintaining safety for road users and complying with the requirements of the Provincial Minimum Maintenance Standards.

The SMP is intended to be a living document to incorporate new approaches and technologies while meeting fiscal demands and keeping road safety as the first priority. The SMP will be reviewed annually in this context and updated every five years with endorsement from Elgin County Council.

1.3 Responsibility

It is the responsibility of every road authority involved in winter maintenance activities on Elgin County roads to effectively manage the road salt used.

It is the responsibility of the County of Elgin to ensure that the SMP is developed, maintained, updated and implemented throughout the County of Elgin.

The LMPs are responsible to ensure winter maintenance equipment operators and patrol persons receive appropriate training, and that equipment is calibrated annually. All personnel are to be familiar with the Code of Practice for the Environmental Management of Road Salts.

It is the responsibility of all local Road Supervisors involved in winter maintenance to ensure that the SMP is maintained, and implemented within their jurisdiction.

2.0 SALT MANAGEMENT POLICY

The LMPs are each responsible for maintaining their own Municipal Roads and for providing road maintenance services to the County of Elgin under formal agreement to maintain the County's roads within their jurisdiction.

The County of Elgin adheres to the Municipal Act, 2001 Provincial Ontario Regulation 239/02 - "Minimum Maintenance Standards for Municipal Highways" and as amended by Ontario Regulation 366/18.

Applicable excerpts from the Ontario Regulations are included below.

Patrolling

3. (1) The standard for the frequency of patrolling of highways to check for conditions described in this Regulation is set out in the Table to this section. O. Reg. 23/10, s. 3 (1); O. Reg. 366/18, s. 3 (2).
(2) If it is determined by the municipality that the weather monitoring referred to in section 3.1 indicates that there is a substantial probability of snow accumulation on roadways, ice formation on roadways or icy roadways, the standard for patrolling highways is, in addition to that set out in subsection (1), to patrol highways that the municipality selects as representative of its highways, at intervals deemed necessary by the municipality, to check for such conditions. O. Reg. 47/13, s. 2; O. Reg. 366/18, s. 3 (2).
(3) Patrolling a highway consists of observing the highway, either by driving on or by electronically monitoring the highway, and may be performed by persons responsible for patrolling highways or by persons responsible for or performing highway maintenance activities. O. Reg. 23/10, s. 3 (1).
(4) This section does not apply in respect of the conditions described in section 10, subsections 11 (0.1) and 12 (1) and section 16.1, 16.2, 16.3 or 16.4. O. Reg. 23/10, s. 3 (1); O. Reg. 366/18, s. 3 (3).

TABLE
PATROLLING FREQUENCY

Class of Highway	Patrolling Frequency
1	3 times every 7 days
2	2 times every 7 days
3	once every 7 days
4	once every 14 days
5	once every 30 days

O. Reg. 239/02, s. 3, Table; O. Reg. 23/10, s. 3 (2).

Weather monitoring

3.1 (1) From October 1 to April 30, the standard is to monitor the weather, both current and forecast to occur in the next 24 hours, once every shift or three times per calendar day, whichever is more frequent, at intervals determined by the municipality. O. Reg. 47/13, s. 3; O. Reg. 366/18, s. 4.
(2) From May 1 to September 30, the standard is to monitor the weather, both current and forecast to occur in the next 24 hours, once per calendar day. O. Reg. 47/13, s. 3; O. Reg. 366/18, s. 4.

Snow accumulation, roadways

4. (1) Subject to section 4.1, the standard for addressing snow accumulation on roadways is,
(a) after becoming aware of the fact that the snow accumulation on a roadway is greater than the depth set out in the Table to this section, to deploy resources as soon as practicable to address the snow accumulation; and
(b) after the snow accumulation has ended, to address the snow accumulation so as to reduce the snow to a depth less than or equal to the depth set out in the Table within the time set out in the Table,
(i) to provide a minimum lane width of the lesser of three metres for each lane or the actual lane width, or
(ii) on a Class 4 or Class 5 highway with two lanes, to provide a total width of at least five metres. O. Reg. 47/13, s. 4; O. Reg. 366/18, s. 5 (1).
(2) If the depth of snow accumulation on a roadway is less than or equal to the depth set out in the Table to this section, the roadway is deemed to be in a state of repair with respect to snow accumulation. O. Reg. 47/13, s. 4.
(3) For the purposes of this section, the depth of snow accumulation on a roadway and, if applicable, lane width under clause (1) (b), may be determined in accordance with subsection (4) by a municipal employee, agent or contractor, whose duties or responsibilities include one or more of the following:
1. Patrolling highways.
2. Performing highway maintenance activities.
3. Supervising staff who perform activities described in paragraph 1 or 2. O. Reg. 47/13, s. 4; O. Reg. 366/18, s. 5 (2).
(4) The depth of snow accumulation on a roadway and lane width may be determined by,
(a) performing an actual measurement;
(b) monitoring the weather; or
(c) performing a visual estimate. O. Reg. 47/13, s. 4; O. Reg. 366/18, s. 5 (3).
(5) For the purposes of this section, addressing snow accumulation on a roadway includes,
(a) plowing the roadway;
(b) salting the roadway;
(c) applying abrasive materials to the roadway;
(d) applying other chemical or organic agents to the roadway;
(e) any combination of the methods described in clauses (a) to (d). O. Reg. 366/18, s. 5 (4).
(6) This section does not apply to that portion of the roadway,
(a) designated for parking;
(b) consisting of a bicycle lane or other bicycle facility; or
(d) used by a municipality for snow storage. O. Reg. 366/18, s. 5 (4).

TABLE
SNOW ACCUMULATION - ROADWAYS

Class of Highway	Depth	Time
1	2.5 cm	4 hours
2	5 cm	6 hours
3	8 cm	12 hours
4	8 cm	16 hours
5	10 cm	24 hours

O. Reg. 47/13, s. 4; O. Reg. 366/18, s. 5 (5).

Ice formation on roadways and icy roadways

5. (1) The standard for the prevention of ice formation on roadways is doing the following in the 24-hour period preceding an alleged formation of ice on a roadway:
1. Monitor the weather in accordance with section 3.1.
2. Patrol in accordance with section 3.
3. If the municipality determines, as a result of its activities under paragraph 1 or 2, that there is a substantial probability of ice forming on a roadway, treat the roadway, if practicable, to prevent ice formation within the time set out in Table 1 to this section, starting from the time that the municipality determines is the appropriate time to deploy resources for that purpose. O. Reg. 366/18, s. 8.
(2) If the municipality meets the standard set out in subsection (1) and, despite such compliance, ice forms on a roadway, the roadway is deemed to be in a state of repair until the applicable time set out in Table 2 to this section expires after the municipality becomes aware of the fact that the roadway is icy. O. Reg. 366/18, s. 8.
(3) Subject to section 5.1, the standard for treating icy roadways is to treat the icy roadway within the time set out in Table 2 to this section, and an icy roadway is deemed to be in a state of repair until the applicable time set out in Table 2 to this section expires after the municipality becomes aware of the fact that a roadway is icy. O. Reg. 366/18, s. 8.
(4) For the purposes of this section, treating a roadway means applying material to the roadway, including but not limited to, salt, sand or any combination of salt and sand. O. Reg. 366/18, s. 8.
(5) For greater certainty, this section applies in respect of ice formation on bicycle lanes on a roadway, but does not apply to other types of bicycle facilities. O. Reg. 366/18, s. 8.

TABLE 1
Ice Formation Prevention

Class of Highway	Time
1	6 hours
2	8 hours
3	16 hours
4	24 hours
5	24 hours

O. Reg. 366/18, s. 8.

TABLE 2
Treatment of ICY ROADWAYS

Class of Highway	Time
1	3 hours
2	4 hours
3	8 hours
4	12 hours
5	16 hours

O. Reg. 366/18, s. 8.

3.0 Best Management Practices

The Canadian Code of Practice for the Environmental Management of Road Salts and the TAC Syntheses of Best Practices has identified Best Management Practices for the handling, storage and use or road salts. Code of Practice objectives have been defined in the following categories: Annual Reports, Salt Management Plans, Salt Storage, Salt Application, Snow Disposal, Training and Salt Vulnerable Areas. A list of the Code of Practice Objectives along with corresponding Performance Indicators is provided in Table '1'.

Table 1 Code of Practice Objectives and Performance Indicators

CODE OF PRACTICE OBJECTIVES	PERFORMANCE INDICATORS
Annual Reports	
• Submit annual reports by June 30.	• Submission of annual reports.
Salt Management Plans	
• Develop and implement salt management plans that meet the contents in Section 9 of the Code.	• Preparation and implementation of salt management plans.
Salt Storage	
• Store road salts under a permanent roof and on an impermeable surface. • Cover blended sand/salt piles. • Implement handling practices that avoid uncontrolled releases (good housekeeping practices). • Manage drainage to control the release of contaminants, including from wastewater from equipment washing and facility.	• Salt stored under cover and on impermeable pads. • Blended sand/salt piles covered. • Implementation of good housekeeping practices. • Presence of runoff collection systems or management of salt impacted drainage.
Salt Application	
• Use advancements in winter maintenance materials, equipment and decision support systems, such as road weather information systems.	• Use of electronic spreader controls. • Use of pre-wetting. • Use of direct liquid application. • Presence of an equipment calibration and re-calibration program. • Use of road weather information systems. • Use of pavement temperatures when making salt application decisions.
Snow Disposal	
• Implement handling practices that avoid uncontrolled releases. • Manage drainage to control the release of contaminants.	• Implementation of good housekeeping practices. • Engineered sites with collection of runoff and meltwater. • Presence of meltwater collection ponds.
Training	
• Train staff in best management practices and provide periodic training in salt management.	• Implementation of training programs in best management practices.
Salt Vulnerable Areas	
• Identify salt vulnerable areas. • Manage salt use in salt vulnerable areas to minimize impacts.	• Inventories of salt vulnerable areas. • Implementation of best practices to reduce impacts.

3.1 Annual Reports

The County of Elgin is responsible to report various road salt management metrics to Environment Canada annually and before June 30th. In advance of the reporting deadline, LMPs will submit applicable information to the County by May 1st each calendar year, with respect to their road salt use and management over the previous winter season.

3.2 Salt Management Plans

The County of Elgin is responsible for developing a Salt Management Plan that satisfies the objectives of the Canadian Code of Practice for the Environmental Management of Road Salts. This plan is updated and approved by County Council once every 5 years.

3.3 Salt Storage Sites

The objective for salt storage sites is the prevention or control of releases from existing and new sites. In pursuing this objective, the following practices should be considered:

- Coverage of salt piles and blended salt-sand piles
- Handling practices that avoid uncontrolled releases
- Drainage management
- Wash water collection and treatment
- Training of personnel, and
- Monitoring the effectiveness of the facility

Currently, every LMP stores salt materials under cover and on impermeable surfaces. Forty-three (43%) of the LMPs have the ability to load salt indoors while every LMP loads salt on impermeable surfaces and continually cleans up any spilled materials as good housekeeping practices.

3.4 Salt Application

The objective for salt application is the reduction of the negative impacts of road salts by delivering the right amount of road salts in the right place at the right time. In pursuing this objective, consideration should be given to using the most recent advancements in the application of winter maintenance anti-icing and de-icing materials, winter maintenance equipment and road weather information and other decision support systems. As well, the training of personnel and the monitoring of the effectiveness of road salt application techniques should be considered.

Currently, every LMP utilizes ground spreading controls and has automated vehicle location systems on their entire fleet dedicated to winter control. Most LMPs either pre-wet salt before it is applied or use pre-treated salt.

3.5 Snow Disposal

The objective for snow disposal is the control of releases from existing and new sites. In pursuing this objective, the following practices should be considered:

- Location and construction of the sites considering operational and environmental factors
- Drainage management
- Training of personnel
- Monitoring of the effectiveness of the facility

Currently, forty-three (43%) of the LMPs have seasonal snow disposal sites (3 across Elgin County).

3.6 Training

Plans and policies are normally created by managers and supervisors in an organization. The successful implementation of the Salt Management Plan is contingent upon front line staff and operators being familiar about the plan and how best to achieve its objectives. In order to be most effective, staff at all levels should be aware of this plan and trained on a routine basis with respect to road salt management best practices.

Currently every LMP either follows a local schedule or is in the midst to developing a local schedule to ensure managers, supervisors and operators receive up to date training regularly.

3.7 Salt Vulnerable Areas

A “salt vulnerable area” means an area particularly sensitive to road salts where additional salt management measures may be necessary to mitigate the environmental effects of road salts in that area. Organizations should identify areas that may be particularly sensitive to road salts. Once a vulnerable area has been identified, organizations may then determine the level of vulnerability and the need to implement additional salt management measures. Additional salt management measures in salt vulnerable areas may include:

- Using technologies that further optimize the use of road salts
- Using environmentally, technically and economically feasible alternatives to road salts
- Increasing monitoring and measuring of chlorides and/or their impacts
- Locating patrol yards and snow disposal sites outside vulnerable areas
- Considering location and protection of vulnerable areas in the design of new roads and/or upgrading of existing roads.

It is important to note, when identifying vulnerable areas, that an area may be vulnerable either to infrequent but heavy addition of road salts or to light but frequent addition of road salts.

Organizations may consider consulting with other agencies such as conservation authorities and source water protection boards who may have information regarding potential road salt vulnerable areas within common jurisdictions.

Currently only one salt vulnerable site has been identified (Hamlet of Richmond) as a local source water protection area.

4.0 Current Practices and Goals

An inventory of the current road salt use practices has been undertaken to form a benchmark against which progress can be measured. Elgin County's local municipal partners have provided information with respect to their current practices within each of the Best Management Practices categories: Spreading Materials and Equipment, Salt Vulnerable Areas, Salt Storage Sites, Snow Disposal and Training. The summary of current practices by municipality is provided in Table '3'.

Each respective municipality manages their own staff and resources as they deem best suited to meet the Provincial Minimum Maintenance Standards for winter control activities. As it pertains to road salt management, it is envisioned that the best management practices outlined in this plan be adopted as goals by Elgin's local municipal partners (LMPs) and be implemented as opportunities present themselves (i.e. equipment replacement) and as financial planning and competing budgets permit.

TABLE 3 – CURRENT ROAD SALT MANAGEMENT PRACTICES BY MUNICIPALITY

SALT MANAGEMENT PLAN CURRENT PRACTICES (2020) BY MUNICIPALITY	Municipality of West Elgin	Municipality of Dutton/Dunwich	Township of Southwold	Municipality of Central Elgin	Township of Malahide	Town of Aylmer	Municipality of Bayham
Total km of County Road maintained	99.533	96.693	101.275	140.369	146.191	4.124	91.247
Total tonne of Salt Used in previous winter season (2019/20)	569	903	688	*1579*	1221	75	1197
Total Salt/Sand mix used on County roads	276	852	98	323	582		605
Percentage of Salt in Salt/Sand Mix	5%	33%	10%	5%	10%	40%	15%
Quanity (Litres) of liquid applied							
Brine	500						
Beet Juice		15906			9867		15900
Other				54258			
Amount of Liquid used for pre-wetting salt material (Litres)		11000	pre-treated	53549	5555		2100
Amount of Liquid used for anti-icing (Litres)	500	4906		709.66	4312		4100
SPREADING MATERIALS AND EQUIPMENT							
Salt Application Rate (kg/km)	130 (general), 170 (freezing rain)	75, 100, 130, 150, 170	75, 100, 150	130	70, 90, 110, 130	200	100 (120 on hills)
Sand Application Rate (kg/km)	285 (general), 570 (packed)	200, 250, 300, 350, 400, 450, 570	325, 570	570	350, 450, 550	550	
Sand / Salt Mix Application Rate (kg/km)						490	300
Number of Vehicles Assigned to salt application	3	5	7	9	8	2	4
Number of vehicles with ground sensor controls	3	5	7	9	8	1	4
Number of vehicles equipped with pre-wetting	0	3	0	7	8	0	3
Number of vehicles designed for direct liquid	1	1	2	1	1	0	1
Percentage of Fleet that records salt application rates	100	100	100	100	100	0	100
Percentage of Fleet that has automated vehicle location	100	100	100	100	100	100	100
Use of alternate freeze point depressants	Brine, 500L annually	Beet Juice - 20,000L annually	Pretreated salt	MasterMelt - 54,258L annually	none	none	Beet Juice - 15,900L annually
Number of surface temperature measuring devices	4	10	every truck	6	5	2	7
Use of dedicated pavement and/or atmospheric forecasting systems	Provincial RWIS	MESH	none	OGRA Weather Tracker App	OGRA Weather Tracker App	none	none
SALT VULNERABLE AREAS							
Locations of salt vulnerable areas (i.e. wetlands, source water protection areas)	none	none	none	none	none	Not identified	Hamlet of Richmond
Description of winter maintenance practices in the vicinity of salt vulnerable areas (i.e. alternate treatment)	n/a	n/a	n/a	n/a	n/a	none	Sand/salt or 70kg/km salt rate
SAND AND SALT STORAGE SITES							
Number and capacity (tonne) of storage sites	22413 Hoskins Line 500t salt, 1,500t sand	136 Currie Road 400t salt	35663 Fingal Line 4,000t	42434 Fruitridge Line 2,000t salt, 1,000t sand	49458 John Wise Line - 1,300t 13272 Imperial Road - 1,000t	32 Chipchase Court 570t salt	8354 Plank Road (2 buildings) 3000t
Percentage of salt/sand stored under cover on impermeable pads	100	100	100	100	100	100	100
Percentage of facilities with indoor loading	0	0	100	100	0	0	100
Percentage of sites with management of salt impacted drainage	0	0	0	100	0	100	0
Number of salt storage sites that have collection systems	1	0	0	1	0	1	1
Where is runoff diverted to?	municipal drain	na	na	municipal drain	na	pond	municipal drain
Levels of environmental indicators (i.e. chloride levels)	none	none	none	none	none	none	none
Percentage of salt in winter sand	5	5	10	5	10	40	15
Good Housekeeping Practices	yes	no	yes	yes	no	yes, not formalized	material mixing done on pad
Materials handled on impermeable surfaces?	yes	yes	yes	yes	yes	yes	yes
Equipment used to prevent truck overloading?	no	yes	no	yes	no	yes	no
System for collection/treatment of wastewater?	no	yes	no	yes	no	yes	no
control of external waters not impacted by salt?	yes	yes	no	yes	no	yes	no
Ongoing cleanup of sites and spilled materials?	yes	yes	yes	yes	yes	yes	yes
Risk Management and emergency plans in place?	yes	yes	yes	yes	yes	yes	no
SNOW DISPOSAL SITES							
Number and capacity of snow disposal sites (permanent/seasonal)	Rodney and West Lorne Seasonal	very large capacity seasonal	none	none	none	6,250m3 capacity Seasonal	none
Levels of Environmental Indicators	no	no	n/a	n/a	n/a	no	n/a
Percentage of disposal sites with water management systems	none	none	n/a	n/a	n/a	none	n/a
Conformance with existing environmental standards	n/a	n/a	n/a	n/a	n/a	yes	n/a
Existence of a good housekeeping policy	n/a	n/a	yes	n/a	n/a	n/a	n/a
Disposed upon low permeability surface?	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Meltwater directed to retention pond before discharged?	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Meltwater dischared to municipal sewer?	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Meltwater dischared into watercourse?	n/a	n/a	n/a	n/a	n/a	ditch	n/a
TRAINING							
Percentage and frequency of staff receiving traiing in Best Salt Management Practices							
- Managers	100% annually	50%	pending	100% annually	100% annually	Review local policy annually	100% annually
- Supervisors	100% every 2-3 years	pending	pending	100% annually	100% annually	Review local policy annually	100% annually
- Operators	100% annually in-house	pending	pending	100% annually	100% annually	Review local policy annually	100% annually

5.0 Conclusion

The County of Elgin in collaboration with its local municipal partners are committed to maintaining roads during the winter season in accordance with Provincial regulations. Winter control activities utilizing road salt is necessary to achieve this goal. Excessive use of road salt can have environmental impacts and the road authorities across Elgin County recognize this responsibility.

The Salt Management Plan has been created as a resource and guide for road authorities across Elgin County to determine the most effective methods to maintain safety for road users while managing the effects of road salt on the environment.