

Annual Report for Year 1 (2022-2023) of the Time Limited Water
Quality Standard for Chloride

June 28, 2023

Prepared by the Village of Flossmoor Public Works Department



The Village of Flossmoor is a member
of the Chicago Area Waterways
Chloride Workgroup



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1.0 Introduction to Chloride Issue in CAWS/LDPR

This Pollutant Minimization Plan (PMP) has been prepared by the Village of Flossmoor to reduce the environmental impacts from the organization's chloride related operations. The Village of Flossmoor is a discharger covered under the Time Limited Water Quality Standard for Chloride for the Chicago Area Waterways System and Lower Des Plaines River watersheds. This PMP has been prepared to meet the requirements laid out in the Time Limited Water Quality Standard (TLWQS) for Chloride. The term of this PMP covers the first 5-years of the TLWQS period and will be updated following the re-evaluations at Years 4 ½, 9 ½, and 14 ½.

Chloride is a permanent pollutant. It does not degrade over time and continues to accumulate in the environment. Proactive measures to reduce the amount of chloride discharged can help reduce the impacts from chloride on receiving waterways and the environment. Chloride impacts aquatic life, vegetation, and infrastructure. As the chloride concentrations increase and our waters become saltier, aquatic and plant biodiversity decreases and native species are overtaken by salt tolerant invasive species.

Chlorides are commonly found in road salt, fertilizers, water softeners, dust suppressants, and certain industrial processes. Chloride-based deicers, like rock salt, are used on parking lots, sidewalks, and roads to provide safe surfaces to the public during the winter months. These deicers are one of most common sources of chloride in the Chicago region.

The water quality standard for chloride for the Chicago Area Waterway System (CAWS) was updated as part of the rulemaking process related to changing the designated use of the CAWS. The chloride standard was updated from 1,500 mg/L during the winter and 500 mg/L during the summer to 500 mg/L all year round. The change in the chloride water quality standard took effect in 2018. Because portions of the CAWS were not going to meet this new standard due to the need to maintain public safety on roads, highways, sidewalks and parking lots during the winter months, a joint submittal and supporting individual petitions were submitted between 2015 and 2018 to the Illinois Pollution Control Board for a variance from the chloride standard. The joint petition laid out best management practices that can be achieved by the petitioners to reduce their chloride use while maintaining public safety during winter storms. In addition to the CAWS, portions of the Lower Des Plaines River watershed were included as it receives water from the CAWS.

On November 4, 2021, the IPCB issued an Opinion and Order for a Time Limited Water Quality Standard (TLWQS) for Chloride for portions of the CAWS and Lower Des Plains River watersheds. The TLWQS for Chloride watersheds are defined in the Opinion and Order as the Des Plaines River watershed from the Kankakee River to the Will County Line (except for the DuPage River watershed) and the CAWS watershed (except the North Branch Chicago River watershed upstream of the North Shore Channel and those portions of the watershed located in Indiana). This is a watershed-based approach to reduce the chloride concentrations in the CAWS and Lower Des Plaines River. The TLWQS for Chloride requires all dischargers covered under the TLWQS for Chloride to create PMPs and implement specific best management practices based on their operations to reduce their chloride discharges.

2.0 Organization, Facility Information

Agency Name: Village of Flossmoor		
Facility Name: Public Works Service Center		Permit Number: ILR40-0337
Facility Address: 1700 Central Park Avenue		
City: Flossmoor	State: Illinois	Zip Code: 60422

The Village of Flossmoor is a bedroom community in south Cook County, Illinois. Flossmoor has an area of 3.5 square miles. During winter snow maintenance operations, Flossmoor maintains 84 lane miles of public roadways, 7 municipal parking lots, and 2.7 miles of public sidewalks along certain school and commuter routes and around our municipal facilities. The Flossmoor Public Works Department also has a salt storage building at our Public Works Service Center that has an approximate capacity of 250 tons and a 5,000 gallon anti-icing liquid storage tank.

2.1 Level of Service for Winter Maintenance Activities

The Village of Flossmoor Public Works Department applies anti-icing liquid to our roadways and parking lots prior to all forecasted snowfall events that are anticipated to accumulate snowfall or produce icy pavement conditions. Snowplowing begins when snow accumulations reach 2” or more. Road salt is also applied using a prewet setup on roadways as needed to control ice development following snowplowing. Road salt is applied at a rate of 200 lbs/lane mile. Sidewalks are also plowed and salted when snowfall accumulations reach 2” or more.

The Village has been following a limited salting policy since 1987. In accordance with this policy, salting is only completed on primary streets, intersections, hills, curves, parking lots, and in the Central Business District. The exception to this policy is if ice forms on the pavement, then all roadways are salted or liquid is applied.

3.0 Best Management Practices

Details regarding the Village of Flossmoor’s implementation of the best management practices (BMPs) identified as part of the TLWQS for Chloride are included below.

Workgroup BMP

BMP	Agency Description of Current Implementation or Status Update to the Plan to Implement the BMP
The permittee must participate in a Chlorides workgroup for the CAWS or LDPR, depending on the watershed within which the facility’s discharge is located.	The Village of Flossmoor has been a member of the Chicago Area Waterways Chloride Workgroup since 2022. Public Works staff had attended workgroup meeting and trainings.

Salt Storage and Handling BMPs

BMP	Agency Description of Current Implementation or Status Update to the Plan to Implement the BMP
Store all salt on an impermeable pad that must be constructed to ensure that minimal stormwater is coming into contact with salt unless the salt is stored in a container that ensures stormwater does not come into contact with the salt.	A majority of salt stored by the Village of Flossmoor is stored in a permanent salt storage building with concrete floor, with the front opening tarped to prevent contact with stormwater. A portion of the salt stored at our facility is stored in a concrete bin, with concrete floor, and heavy duty tarp cover.
Cover salt piles at all times except when in active use, unless stored indoors.	Excess salt is stored in a concrete bin, with concrete floor, and heavy duty tarp cover.
For working areas, provide berms and or sufficient slope to allow snow melt and stormwater to drain away from the area. If snow melt and stormwater cannot be drained away from the working area, channeling water to a collection point such as a sump, holding tank or lined basin for collection, discharge at a later time, use for prewetting, and use for make-up water for brine must be considered.	The working areas around the salt storage building are sloped away from the storage building concrete pad.
MS4/CSO Only - Use deicing material storage structures for all communities covered under General Permit ILR40 for MS4 communities.	All deicing materials are stored in appropriate structures at the Public Works Service Center.
Good housekeeping practices must be implemented at the site, including: <ul style="list-style-type: none"> • cleanup of salt at the end of each day or conclusion of a storm event; • tarping of trucks for transportation of bulk chloride; • maintaining the pad and equipment; • good practices during loading and unloading; 	All good housekeeping practices are implemented as listed.

<ul style="list-style-type: none"> • cleanup of loading and spreading equipment after each snow/ice event; • a written inspection program for storage facility, structures and work area; • removing surplus materials from the site when winter activity finished where applicable; • annual inspection and repairs completed when practical; • evaluate the opportunity to reduce or reuse the wash water. 	
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Winter Maintenance Operations BMPs

BMP	Agency Description of Current Implementation or Status Update to the Plan to Implement the BMP
Calibrate all salt spreading equipment at least annually before November 30th. Records of the calibration results must be maintained for each piece of spreading equipment.	All salt spreading equipment is calibrated each year before November 30. Records of the calibration results are maintained at the Public Works Service Center.
Pre-wet road salt before use, either by applying liquids to the salt stockpile, or by applying liquids by way of the spreading equipment as the salt is deposited on the road.	The Department’s four large 5-yard dump trucks have pre-wet systems installed that pre-wets the salt at the spreader during application. The Departments three small 1-ton dump trucks do not have pre-wet systems for spreading salt on parking lots.
Use equipment to measure the pavement temperature unless such equipment has already been installed on road salt spreading vehicles.	Two of the Department’s large 5-yard dump trucks have pavement temperature sensors installed. We also have a temperature gun to check pavement temperatures at other locations as needed.
Develop and implement a protocol to vary the salt application rate based on pavement temperature, existing weather conditions, and forecasted weather conditions.	We currently vary the use of salt based on pavement temperature and weather conditions. We also use anti-icing liquid in advance of storm events to limit the amount of salt needed during the events.
Track and record salt quantity used and storm conditions from each call-out.	We currently record all salt and liquid usage on forms based on estimated truck load. We purchased a new loader with scale this

	year to better track the salt amounts used in each event. We hope to have the new loader by this upcoming winter.
Develop a written plan for implementation of anti-icing, with milestones. The plan should consider increased use of liquids (e.g., carbohydrate products) beginning with critical locations such as bridges over streams.	We currently use anti-icing liquid application prior to all snow and ice events, if the weather conditions permit. The plan is included in the Snow and Ice Event Guidelines in Appendix 2.
Provide employees involved in winter maintenance operations with annual training before November 30th on best management practices in the use of road salt in operations, including the practice of plowing first and applying salt only after snow has been cleared.	All employees attend winter operations training on an annual basis prior to November.
Be responsible for complying with all applicable BMPs even when deicing practices are contracted out and ensure that contractors are properly trained and comply with all applicable BMPs.	The Village of Flossmoor does not contract out any of our winter maintenance work.
Complete an annual report, as required by paragraph 3(B) of this order, which is standardized in an electronic format and submitted to the IEPA's website and to the watershed group.	This is the first annual report completed for the 2022/2023 winter season and we will continue to complete it and submit each year.
Obtain and put into place equipment necessary to implement all salt spreading/deicing measure specified in this BMP, such as any new or retrofitted salt spreading equipment necessary to allow for pre- wetting and proper rates of application.	As truck equipment is replaced, all of the necessary salt and liquid application equipment is included in the buildout. Other salt measuring equipment (scale) was purchased this year and we should be taking delivery of the loader this upcoming fall/winter.
MS4/CSO/IDOT/TOLLWAY Only - Install equipment to measure the pavement temperature on the winter maintenance fleet for a sufficient number of vehicles	Temperature sensors have been installed on two of the Department's dump trucks and a hand-held temperature gun is also used to cover other areas as needed.

<p>to provide sufficient information to adjust application rates for the most efficient levels. Develop and complete a plan to equip the winter maintenance fleet before the first re-evaluation.</p>	
<p>MS4/CSO/IDOT/TOLLWAY Only - Before the first re-evaluation, develop a method for conducting a post-winter review to identify areas of success and areas in need of improvement. Items to be completed as part of the review must include, but are not limited to, an evaluation of each salt spreader’s application rate, variations in application rates, and discussion of the variation compared to the recommended rates. Once developed, the review should occur annually in the spring/early summer following each winter season.</p>	<p>Each year following the winter season, Public Works conducts a post-winter review of the winter operations to determine what is working and what needs improvement. This annual review began in 2023.</p>

Additional BMPs Identified for Agency/Facility

BMP	Agency Description of Current Implementation
<p>Limited Salting Policy</p>	<p>The Village has been implementing a limited salting policy since 1987. This policy states that salt is only applied in the Central Business District, principle routes, intersections, hills, curves, and parking lots. Most of the neighborhood street straight sections are not salted, which greatly reduces the amount of salt used in winter operations. An exception to this policy is if an ice event occurs, then all pavement areas are treated with liquid or salt.</p>

3.1 Analysis of BMPs Implemented

Our current BMPs went well this past year and we didn’t have any struggles or issues to speak of. We are looking forward to taking the delivery of our new wheel loader with weight scale this fall or winter so that we can better track our salt usage with more accuracy.

3.2 Analysis of Alternative Treatments or New Technology

We are considering the idea of increasing our liquids usage and possibly purchasing a brine system in the future, so that we can make our brine mixture in-house. We also are interested starting to use liquids (pre-treatment) on our maintained sidewalks to help reduce the amount of rock salt used as part of that operation.

4.0 Deicing/Anti-Icing Agents Used

Materials used by the Village of Flossmoor for the 2022-2023 winter season are included as Appendix 1. Note that the Village has operated under a limited salting policy since 1987. See description under additional BMPs above.

4.1 Application Rates

The application rates used by the Village of Flossmoor for the 2022-2023 winter season are as follows based on the calibration work that is done before the winter season.

Rock Salt Truck Spreaders – 200 lbs./lane mile

Liquid Anti-icing – 40 gallons/lane mile

Salt Pre-Wet Truck Sprayer – 5.5 gallons/ton of salt

4.1.1 Application Rate Analysis

Our application rates worked well this past winter season. The rates have been the same for the last couple of years and we don't anticipate changing them unless we go to more liquid use which should reduce the amount of rock salt needed in the operation.

4.2 Application Practices

The Village of Flossmoor uses the following practices to apply deicing and anti-icing materials:

- Anti-icing with brine mixture (Thermal Point R) on all roadways and parking lots
- Deicing with rock salt and on board pre-wetting (Thermal Point R) on large dump trucks (4 total) on all roadways and parking lots
- Deicing with dry rock salt on small dump trucks (2 total) on parking lots
- Deicing with dry rock salt on small sidewalk tractor spreader and walk behind spreaders

No changes were made this past year to the above practices. We are investigating the use of anti-icing on our sidewalks, which may begin next year.

4.3 Call Outs

A total of nine inches of snow was reported in the Village of Flossmoor for the 2022-2023 winter. There were four freezing rain event(s) and seven snow event(s) for the 2022-2023 winter. The Village of Flossmoor had thirteen call outs completed during the 2022-2023 winter. A log of all call outs completed by the Village of Flossmoor are included as Appendix 2.

4.4 Use of Liquids

The Village of Flossmoor's use of liquids for anti-icing did not increase from the previous year, mainly because we experienced a warmer winter with less snow and ice events. Our use of dry salt applications were reduced for the same reason.

5.0 Training

The Village of Flossmoor completed annual training for twelve employees out of twelve total employees who are part of the winter maintenance operations on October 11 and 12, 2022. A list of annual training topics by type of employee is included as Appendix 3.

6.0 Deicing and Snow Removal Equipment and Maintenance

The Village of Flossmoor uses equipment listed in Appendix 4 during winter maintenance activities.

6.1 Description of Equipment Washing and Wash Water Collection

After each snow or ice event, every piece of equipment is washed off in our wash bay located in the Public Works Service Center. The wash water goes through a triple basin and is discharged into the sanitary sewer system. We have not investigated how we could collect this wash water and re-use it in our anti-icing or pre-wet systems to date.

7.0 Material Storage

The Village of Flossmoor maintains three storage area(s). Information regarding the storage area(s) is included in Appendix 5.

8.0 Capital Purchases

Identified capital purchases from the Village of Flossmoor's PMP to implement the BMPs and reduce chlorides in our operations over the first 5-year term of the Chloride TLWQS are included as Appendix 6.

9.0 Environmental Monitoring Data

Chloride monitoring data is collected for the CAWS and Lower Des Plaines River watersheds per the IPCB order. The data is maintained by the workgroups. Chloride data for the CAWS is collected by MWRD for the CAWS watershed and provided to the workgroups as part of the annual reporting as required by the IPCB order. The Lower Des Plaines Watershed Group also maintains a USGS monitoring station in the Des Plaines River at Channahon, IL that collects continuous conductivity data to estimate chloride concentrations.

Chloride monitoring data reports are posted to <https://www.cawswatershed.org/reports/> and <https://ldpwatersheds.org/about-us/lower-des-plaines-watershed-group/our-work/chloride-tlwqs/>.

9.1 Organization Specific Chloride Monitoring Data

The Village of Flossmoor does not collect separate chloride samples in our jurisdiction.

9.2 Changes to the Facility's NPDES Treatment Technologies for Chloride

No changes were made.

10.0 Program Evaluation

Each year following the winter season, the Village of Flossmoor Public Works Department will review our past winter operations to see where improvements can be made to reduce chloride use. Following this past season, we identified a few operations that need improvement. They are as follows:

- We need to improve the way that we track our salt usage. This past year, we estimated our salt weight by loads and fractions there-of. Through our Capital Equipment replacement program we have purchased a new wheel loader with an integrated weight scale. We anticipate receiving this new loader by the winter of 2023-2024, but delays due to supply chain issues could result in this loader not being delivered until next spring.
- We are investigating the use of liquids on our sidewalks for anti-icing and deicing during snow events. Our plan is to investigate the equipment cost to see if we can procure the equipment for this upcoming season.

10.1 Proposed Steps for the Coming Year

Our plan is to pursue the above items for this upcoming winter season and then re-evaluate the program next year to identify additional opportunities for improvement.

11.0 Workgroup Participation

The Village of Flossmoor participates in the Chicago Area Waterways (CAWS) Workgroup through the following ways.

- Attend and participate in the quarterly membership meetings.
- Participate in the chloride TLWQS mentoring sessions.
- Send all Public Works Staff (that are involved in winter operations) to the Winter Deicing Workshops.
- Connect with other Public Works agencies through our Suburban Public Works Director's Association to share new ideas on winter operations and chloride reduction efforts.
- Utilize outreach materials from the Workgroup by sharing them with our residents at community events and social media.
- Submit Annual Report to workgroup.
- Submitted Pollutant Minimization Plan to the workgroup.
- Participate in CAWCW sponsored surveys related to the workgroup activities and projects.

Appendix 1 - Deicing/Anti-Icing Agents Used

Material or Product	Dry, Pre-Wet, Pretreated, or Liquid	Lane Miles Treated with the Product for 2022-2023	Parking Lot and Sidewalk Area (Sq. Ft.) Treated with the Product for 2022-2023	Total Amount used for 2022-2023 (Year 1) in Tons or Gallons	Total Amount used for 2023-2024 (Year 2) in Tons or Gallons	Total Amount used for 2023-2024 (Year 3) in Tons or Gallons	Total Amount used for 2023-2024 (Year 4) in Tons or Gallons	Total Amount used for 2023-2024 (Year 5) in Tons or Gallons	Total Amount Used Over First 5-Year Term
Rock Salt	Dry	0	71,280	1					1
Rock Salt	Dry	0	239,200	16					16
Rock Salt	Pre-Wet	84	239,200	213					213
Thermal Point R	Liquids	84	239,200	4,727					4,727
									0
									0
									0
									0
									0
									0
									0
									0
									0

Estimates of Relative Material Amounts Applied and Coverage Achieved

Year	Total Lane Miles Maintained	Total Parking Lot and Sidewalk Area (Sq. Ft.) Maintained	Percent of Total Lane Miles Treated with Dry Materials	Percent of Total Lane Miles Treated with Pre-Wet or Pretreated Materials	Percent of Total Lane Miles Treated with Liquids	Percent of Total Parking Lot and Sidewalk Area Treated with Dry	Percent of Total Parking Lot and Sidewalk Area Treated with Pre-wet or Pretreated Materials	Percent of Total Parking Lot and Sidewalk Area Treated with Liquids
2022-2023	84	310,480	0%	100%	100%	100%	77%	77%

Appendix 2

VILLAGE OF FLOSSMOOR WINTER OPERATION CALLOUTS (2022-2023)

Event Date	Truck	Dry Salt (Ton)	Pre-Wet Salt (Ton)	Pre-Wet Liquid (Gal.)	Pre-Treat Liquid (Gal.)	Freezing Rain/ Snow	Snow Depth (inch)
12/20/22	L13				900		
12/21/22	L13				850		
12/22/22	D14		2	13		Snow	4
12/22/22	D15		2	13			
12/22/22	D16		5	25			
12/22/22	D17		2	13			
12/23/22	D17		2	13		Wind	
12/23/22	D16		2	13			
12/23/22	D14		2	13			
12/23/22	D15		2	13			
12/23/22	L12	0.7					
12/23/22	T23	0.1					
12/23/22	Walk Sprd.	0.1					
1/4/23	L13				704		
1/5/23	D16		2	13		Snow	0.3
1/5/23	D15		2	13			
1/5/23	D14		2	13			
1/5/23	D17		2	13			
1/5/23	L11	0.7					
1/13/23	D16		2	13		Snow	0.1
1/13/23	D15		2	13			
1/13/23	D17		2	13			
1/24/23	L13				600		
1/25/23	D17		2	13		Snow	1.5
1/25/23	D16		2	13			
1/25/23	D15		2	13			
1/25/23	D14		2	13			
1/25/23	L12	0.7					
1/27/23	D14		7	37		Snow	0.5
1/27/23	D16		5	25			
1/27/23	D15		16	87			
1/29/23	D17		7	37		Frz. Rain	0.2
1/29/23	D16		5	25			
1/29/23	D14		5	25			
1/29/23	L12	5.5					
1/29/23	L11	5.5					
1/30/23	D17		5	25		Frz. Rain	0.2
1/30/23	L12	2.7					
1/30/23	D14		5	25			
1/30/23	D16		5	25			
1/30/23	D17		2	13			
1/30/23	T23	0.4					
1/30/23	D16		7	37			
1/30/23	D14		5	25			

2/16/23	D16		2	13		Frz. Rain	0.2
2/16/23	D14		5	25			
2/16/23	D17		2	13			
2/16/23	D17		9	50			
2/17/23	D17		2	13		Frz. Rain	0.2
2/17/23	T23	0.1					
2/17/23	D14		9	50			
2/17/23	D16		5	25			
3/3/23	L13				500	Snow	1.5
3/3/23	D17		2	13			
3/3/23	D14		9	50			
3/3/23	D15		5	25			
3/3/23	D16		5	25			
3/3/23	D16		2	13			
3/3/23	D17		2	13			
3/3/23	T23	0.1					
3/3/23	D15		5	25			
3/3/23	D14		5	25			
3/4/23	T23	0.1					
3/4/23	D14		2	13			
3/4/23	D16		5	25			
3/13/23	D14		5	25		Snow	0.5
3/13/23	D15		5	25			
3/13/23	D16		5	25			
3/13/23	D17		2	13			
Totals		17	209	1,147	3,554		9

Appendix 4 - Equipment

Type of Equipment	Equipment/Vehicle Number	Type of Spreader (mechanically controlled, computer controlled, etc.)	Type of Material Used with Equipment (Dry, Pre-Wet, Pretreated, Liquids)	Other Important Equipment Information
5 yd. Dump Truck	D17	Computer Controlled	Pre-Wet	2020 Mack GR42F9
5 yd. Dump Truck	D16	Computer Controlled	Pre-Wet	2020 Mack GR42F9
5 yd. Dump Truck	D15	Computer Controlled	Pre-Wet	2013 International 7400
5 yd. Dump Truck	D14	Computer Controlled	Pre-Wet	2009 Freightliner
2 yd. Dump Truck	L13	Computer Controlled	Liquids	2016 Ford F-350
2 yd. Dump Truck	L12	Computer Controlled	Dry	2012 Ford F-450
2 yd. Dump Truck	L11	Computer Controlled	Dry	2011 Ford F-350
Sidewalk Tractor	T23	Computer Controlled	Dry	2018 Kubota BX2680

Location of Storage Area	Material Stored (Rock Salt, Salt Brine, etc.)	Amount of Material Stored 2022-2023	Material stored under permanent cover? (yes/describe other)	Material stored in a fully enclosed structure? (yes/describe other)	Material stored on an impervious pad? (yes/describe other)	Good housekeeping practices followed at storage area? (yes/describe other)
Public Works Service Center	Rock Salt	250 tons	Yes, salt bin	Yes, 3 sided bin w/ tarp front cover	Yes, concrete	Yes
Public Works Service Center	Rock Salt (overstock)	200 tons (temporary)	Yes, tarp	Yes, 3 sided bin w/ tarp cover	Yes, concrete	Yes
Public Works Service Center	Liquid	4,500 gallons	Yes, tank	Yes, tank	Yes, concrete	Yes

Organization Name:
Village of Flossmoor

Chloride TLWQS Annual Report
Appendix 6 - Capital Purchases

Capital Purchase Description	Plan/Schedule for Purchase
2024 Case 621G XR Wheel Loader w/ Scale	P.O. approved on 5-19-23, waiting on delivery