Center for Technology & Training

# 2020 Michigan Winter Operations Conference

Day 2 – Wednesday, October 14th

MICHIGAN Winter Operations Conference

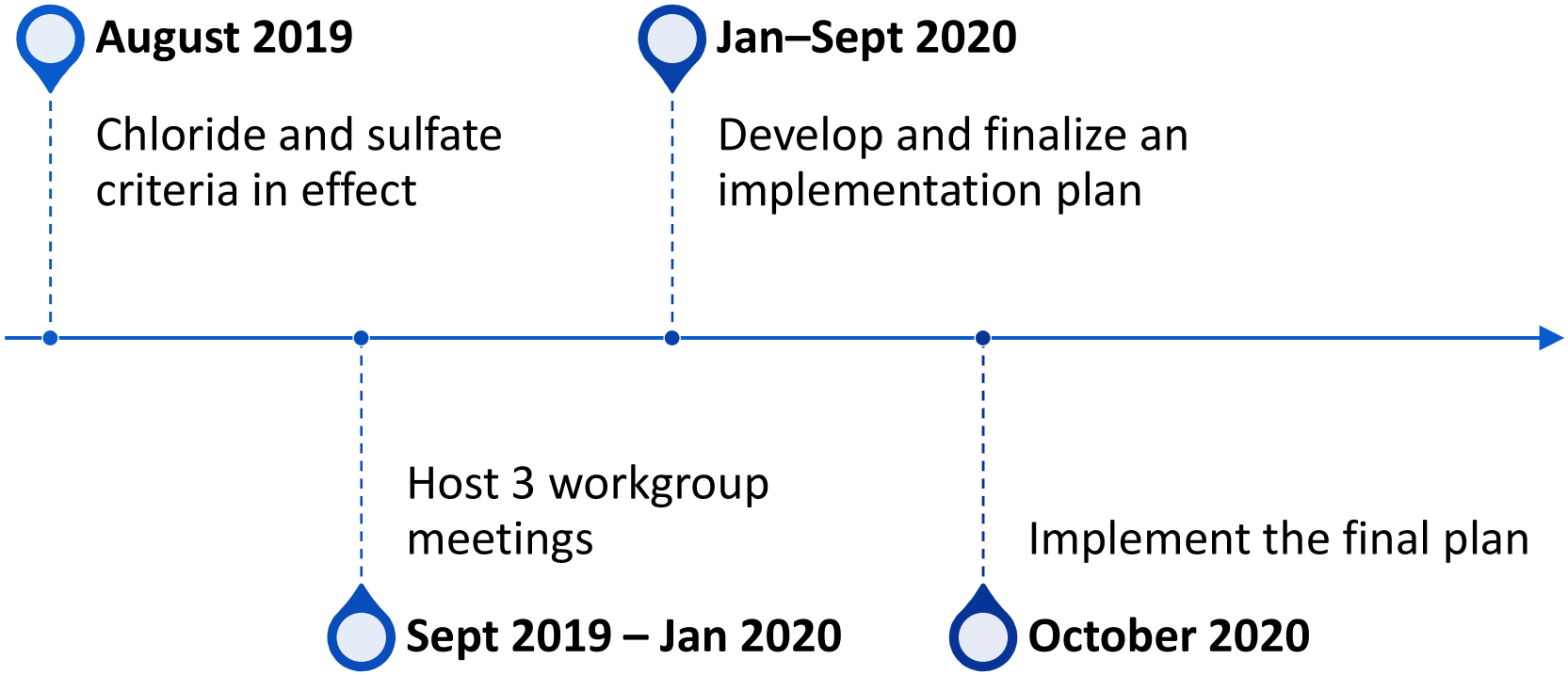
MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

# EGLE Chloride Implementation Plan

Phil Argiroff, PE
Christe Alwin

Water Resources Division

# Timeline


August 2019
Chloride and sulfate criteria in effect
Jan–Sept 2020
Develop and finalize an implementation plan
Host 3 workgroup meetings
Sept 2019 – Jan 2020
Implement the final plan
October 2020

# Workgroup Members

***EGLE Staff***

Christe Alwin, Phil Argiroff, Kevin Goodwin, Glen Schmitt, Jessica Stiles

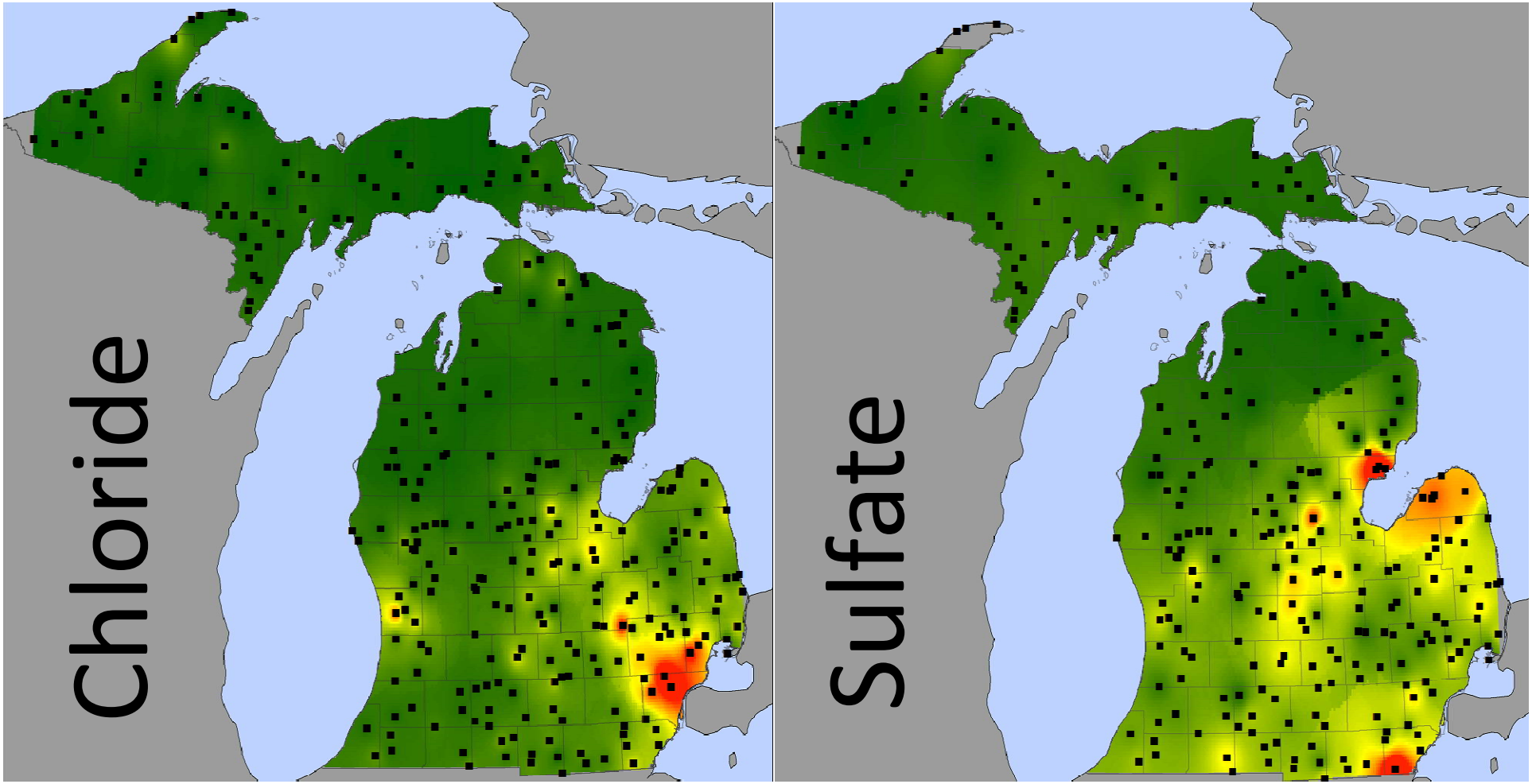
***Invited Members***

- American Water Works Association
- County Road Association of Michigan
- Michigan Aggregate Association
- Michigan Association of County Drain Commissioners
- Michigan Department of Transportation
- Michigan Environmental Council
- Michigan Food Processors Association
- Michigan Manufacturers Association
- Michigan Municipal League
- Michigan Plumbing and Mechanical Contractors Association
- Michigan Water Environment Association
- Mining Operations

# Why Chloride & Sulfate?

- Can be toxic to fish and aquatic wildlife
- Potentially damaging to irrigated plants
- High concentrations found in some Michigan streams and lakes

It only takes **1 teaspoon of salt** to pollute 5 gallons of water to a level that is toxic for freshwater ecosystems.




Based on 2005-2014 Surface Water Sampling

Red - Highest; Yellow – Moderate; Green- Lowest

# Chloride and Sulfate Sources

## Industrial/Commercial Wastewater

- Food processors
- Mining operations

## Municipal Wastewater

- Industrial discharges
- Residential home water softeners

## Stormwater

- Road salt from permitted outfalls

## Nonpoint Sources

- Direct discharges from home water softeners
- Commercial salt application

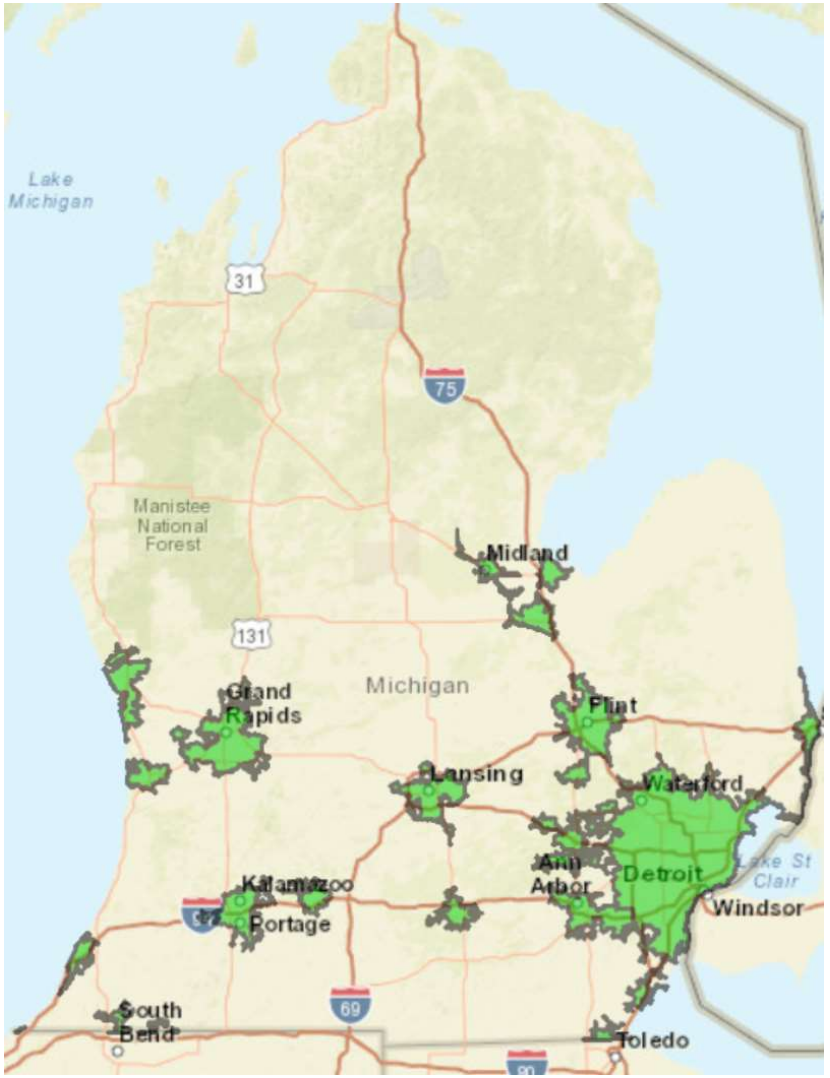
# Road Salt Facts

- Current national usage has doubled since 1975 (15-32 million tons)
- 84% of urban streams had increased chloride levels (USGS, 2014)

# Municipal Separate Storm Sewer System (MS4) Program

***Regulated MS4***

- Municipal Entity: cities, villages, townships, drain commissioners, road commissions, universities, public schools, state agencies
- Located in a Census Urbanized Area
- Own/Operate a separate storm sewer with a discharge to surface waters
- MDOT and 23 Road Commissions/Departments



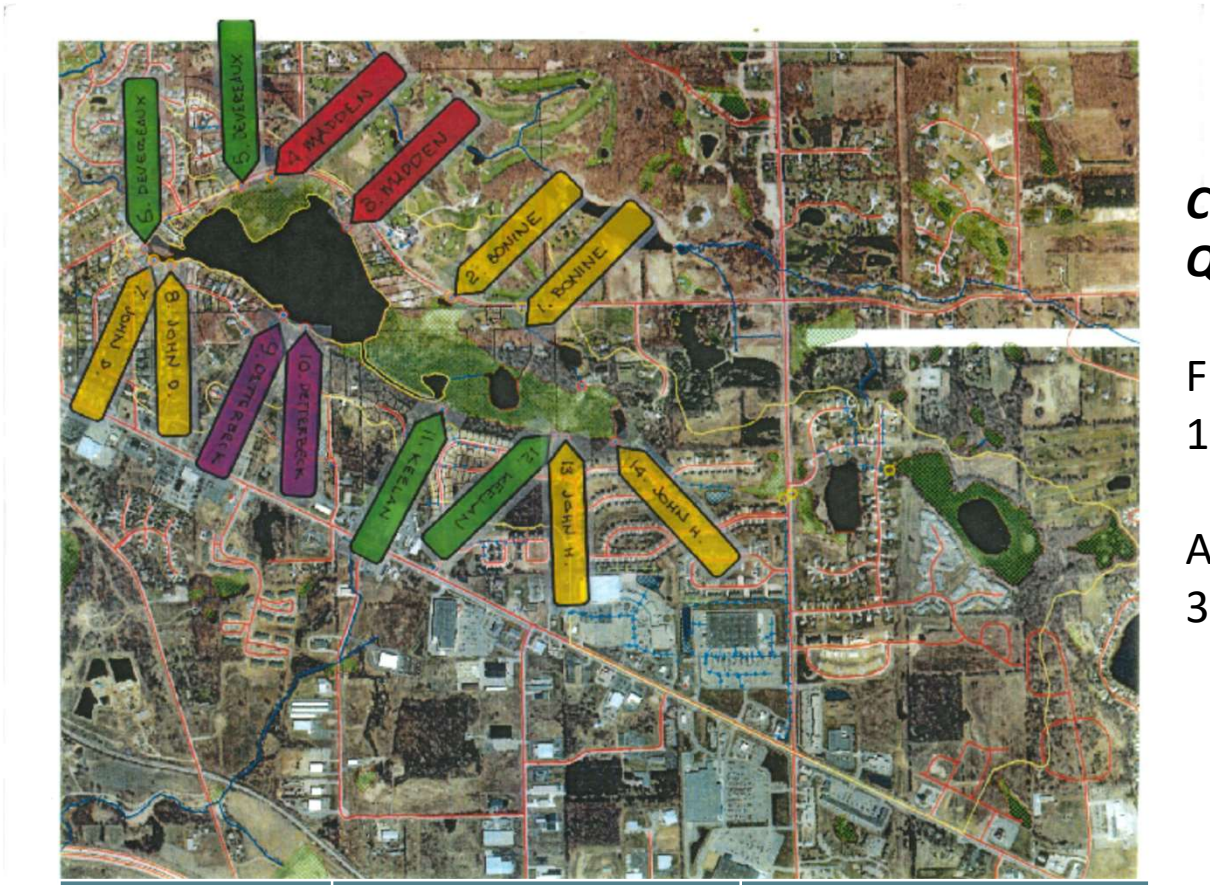
# Earl Lake, Howell

- 2005 and 2018-2019: EGLE performed monitoring at the request of the Earl Lake Homeowners Association

- 2018-2019 Sampling:
  - Surface and bottom sample collected at 5 locations
  - Lake was mixed during all sampling events
  - Highest sample located at the center of the lake (470 mg/l)
  - Concentrations slightly greater in spring samples

- Land Use: large network of roads, commercial and industrial facilities, and heavy residential development (Grand River is five lanes in this location)

# Earl Lake, Howell




| | 2005 | 2018-2019 |
|---|---|---|
| Chloride | 372-480 mg/l | 230-470 mg/l |

***Chloride Water Quality Criteria***

Final Chronic Value
150 mg/l

Aquatic Maximum Value
320 mg/l

## Environment & Public Safety

- The goal of the Implementation Plan is to optimize salt use while maintaining safe travel conditions.
- EGLE understands that application strategies and budgets vary by road agency.
- EGLE understands that road agencies need flexibility in selecting Best Management Practices (BMP).

# Ways to Improve

1. Anti-icing
2. Pre-wetting
3. Calibrate equipment
4. Variable application rates for salt distribution systems
5. Proper salt storage (Part 5 Rules)
6. Good housekeeping

# Ways to Improve

7. Road condition information systems
8. Plow types
9. Pavement temperature sensors
10. Adjust level of service
11. Identify no/low salt areas
12. Education

# Salt Application


- Anti-Icing
- Pre-Wetting
- Direct Liquid Application
- Reduced Speed

**MDOT Salt Bounce and Scatter Study Project Summary Report**

“Salt should be applied at the lowest reasonable speed possible and every attempt should be made to follow the MDOT guideline that all salt must be applied at speeds of 35 mph or below. Salt should be applied at 25 mph whenever possible.”

# Calibrating Equipment

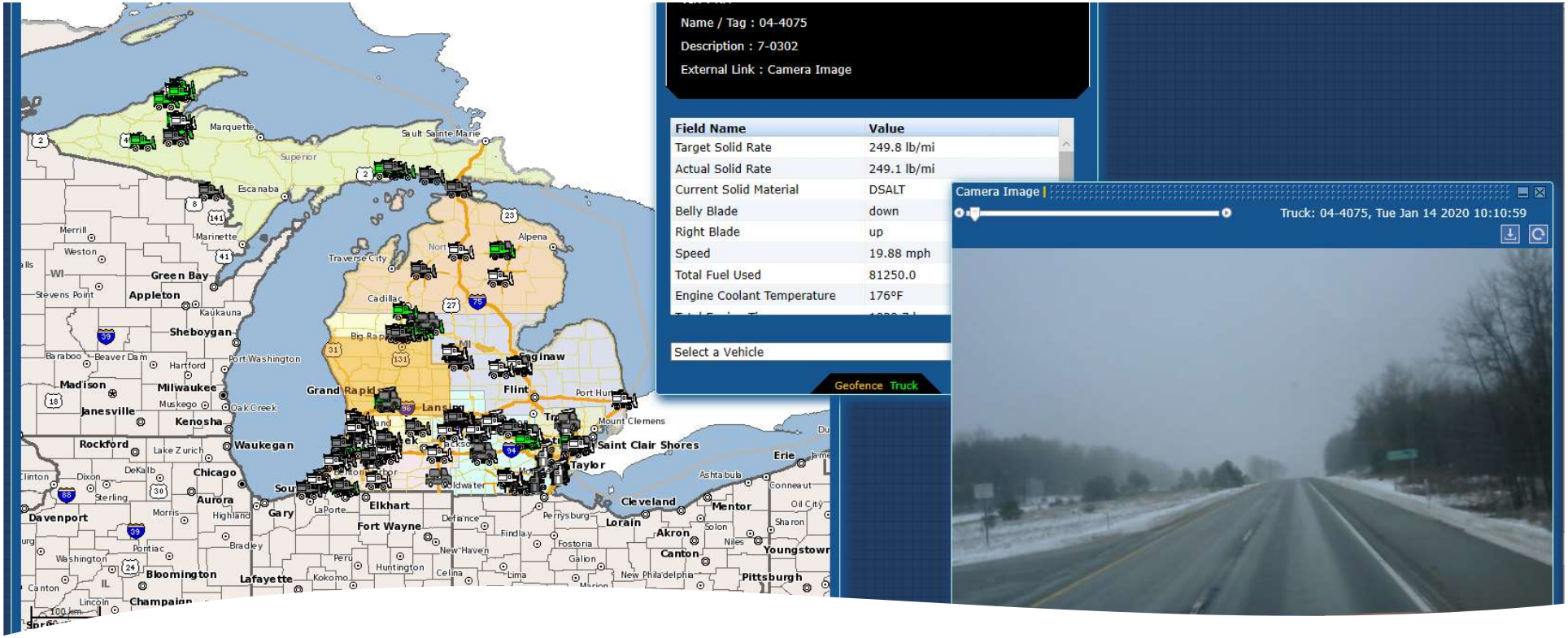
**When…**

- Initial placement of equipment into service (Annual Winter Readiness Program)
- Equipment repair
- Discrepancy between controller setting and actual application amounts
- Switching to a new/different material (salt to sand/salt)

**Holistic approach to equipment calibration and accurate material application: people, machines, materials, and procedures**

# Equipment Options

- Y-Chute
- Rear Cross Conveyor
- Salt Slurry
- Zero Velocity
- Live Edge Plow




# Automated Vehicle Location (AVL)

- Track deployed vehicles during an event
- Track actions taken during an event (e.g. spreading of material and plow movement)
- Generate reports for activities and vehicle diagnostics

# Managing Mobility

TRANSPORTATION

**Reality Check**

**Myth #2:** MDOT has gotten dangerously stingy with salt, and they need to use more!

**Reality:** MDOT has made changes to be more efficient with salt, but not at the expense of safety for motorists.

Advisory **Salting Hills And Intersections** Message Expired

City of Lansing Winter Maintenance Notice: We are currently salting hills and intersections on local streets. Please use caution around salt trucks.

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# Part 5 Rules
# Salt Requirements

***Threshold Management Quantities:***
5 tons/1000 gallons (1% or more salt)

"Secondary containment structure" means a unit, other than the primary container in which polluting material is packaged or held, that is designed, constructed, and operated so that the polluting material cannot escape from the unit through public sewers, drains, or otherwise directly or indirectly into any public sewer system or to the surface waters or groundwaters of this state.

Pollution Incident Prevention Plan required to identify procedures needed to properly contain the salt and address releases and inventory salt storage.

# Salt Storage

- Stored at least 50 feet from the shore/bank of any lake or stream or designated wetland
- Containment structures located within a 100-year floodplain must be designed and structured to remain effective during a 100-year flood

- Loading areas should be covered or enclosed within the storage structure to prevent salt-contaminated runoff. Outdoor loading areas must be surrounded by curbing or graded to direct salt contaminated runoff to an appropriate collection area and the area cleaned of all salt after trucks are loaded and dispatched.


# Brine Storage

- All aboveground brine storage tanks must have secondary containment
- The containment must be able to contain a volumetric capacity of at least 100% of the largest tank capacity or at least 10% of the total volume of tanks within the containment area, whichever is larger
- The containment area should be designed for access at all times

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# Street Sweeping

Develop a street sweeping procedure to ensure the scheduling of spring sweeping maximizes removal of residual salt.

# Public Education

**East Lansing Police Department**

Advisory: City of East Lansing Issues Winter Storm Update

Dear Christe Alwin,

EAST LANSING, Mich. — City of East Lansing officials are continuing to closely monitor the winter storm as it moves through the mid-Michigan region overnight.

While City officials have decided that an emergency weather declaration will not be made tonight, community members are still strongly encouraged to stay off the Department of Public Works (DPW) crews will be continuing to work through the evening and night to clear major roads of snow, sleet and ice.

At this time, the East Lansing Hannah Community Center and East Lansing Public Library are expected to be open to the public during regular hours tomorrow. If th been suspended due to the ongoing inclement weather.

"We would like to thank our DPW crews and first responders for the long hours they have worked during this ongoing weather event to keep the East Lansing comr

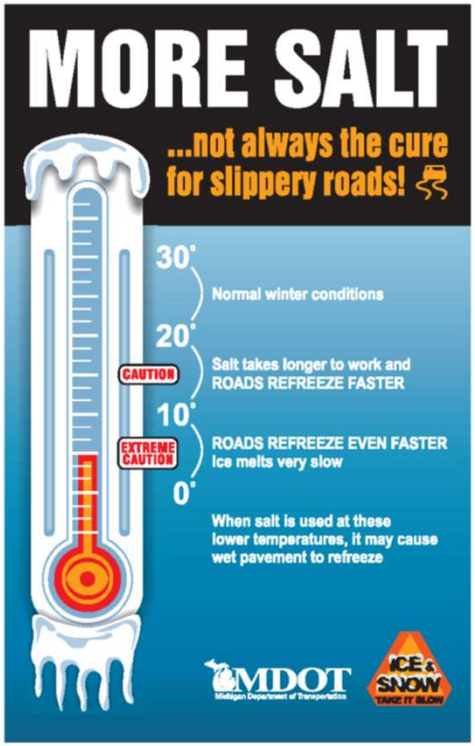
**Nixle Updates**
Community members are strongly encouraged to sign up for Nixle emergency alert updates from the East Lansing Police Department (ELPD) at https://local.nixle.cc text and email updates from ELPD on their phones.

**Power Outages**
With ice and heavy winds in the forecast, there is the potential for power outages. Power outages and downed power lines should be reported to the Lansing Boarc

https://www.lbwl.com/outage-center
https://www.consumersenergy.com/outages/outage-center

Resident are encouraged to call 911 if a downed power line is causing a public safety hazard (i.e. down in a street/sidewalk).

**Downed Trees and Basement Flooding**
There have been a few reports of downed trees in East Lansing. With that in mind, community members should avoid parking under or near trees overnight if possi




**Clear Communication** → **Level of Service Provided** → **Realistic Expectations**



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# Applicator Education



## MICHIGAN WINTER MAINTENANCE EDUCATION PROGRAM

The purpose of this web site is to provide general winter maintenance curricula, training materials and other references in order to promote understanding of best practices for snow and ice abatement and control in Michigan and help reduce road salt environmental impacts on water resources, infrastructure and agricultural commodities.



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# Evaluation

**FHWA Manual of Practices for an Effective Anti-Icing Program**

A post-season review of treatment effectiveness is likewise helpful. It can help identify where changes are needed in equipment, material, and route configurations, and can begin a process of engineering an anti-icing program to fit the exact needs of a site or agency. It can also help identify where changes in personnel procedures and training are needed to improve the effectiveness of the winter maintenance program.

# Lake George Model

- GPS tracking of application rates by truck
- Monthly calibration instead of annually
- Live edge plow reduced salt application by 40%
- Road cameras take photos every 15 minutes to monitor conditions
- Dashboard cameras to further monitor conditions

# Chloride Reduction Strategy

- Implement lower-cost BMPs initially
- Asset management for longer-term improvements (e.g. equipment purchases)
- Expand toolbox to better match storm event conditions

# Implementation Timeline

- Accepting comment on the draft plan through November 9
- 2023/2024 MS4 permittees to implement a chloride reduction strategy
- Outreach in non-urbanized areas
- Continued focused on education across all sectors

# Maintaining the brand…

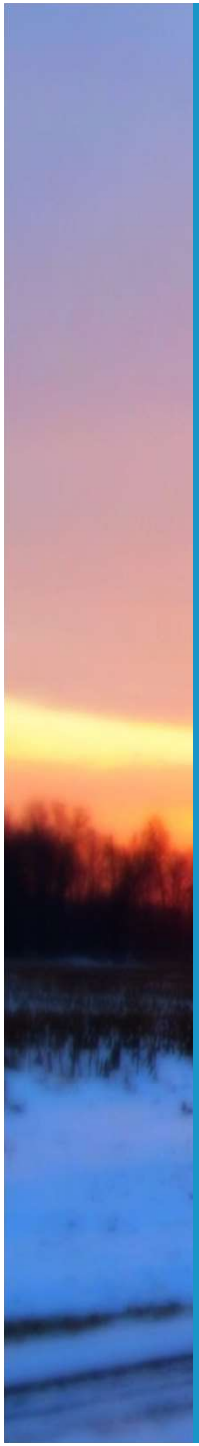
Michigan Department of

**Environment, Great Lakes, and Energy**

Chloride and Sulfate Implementation Plan is available at www.michigan.gov/eglenpdes

Comments accepted through November 9, 2020

Submit comments to Christe Alwin at alwinc@michigan.gov



County Road Association
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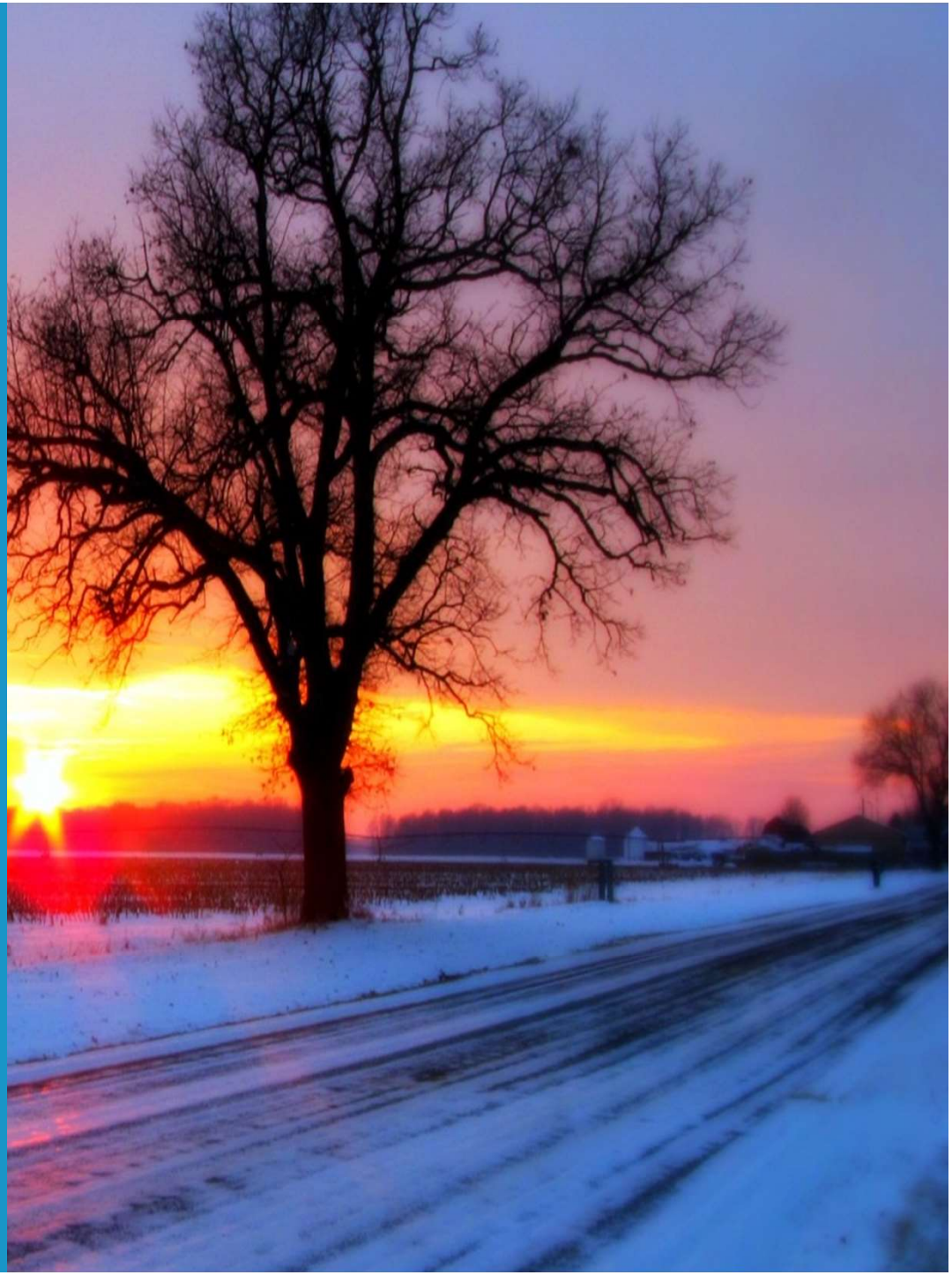
# EGLE Chloride Plan – County road agency winter ops data collection

***Steve Puuri**, PE,*
*Engineering Specialist,*
*CRA and MML*




Now that you know more about the plan for MS4 counties…

*Credit: Chippewa County Road Commission*

# CRA is now compiling winter ops data

- September survey on winter operations
- Info will be used to develop better awareness of winter practices

# County road agency winter ops data

## What does the survey cover?

- Salt application and pretreatment usage;
- Equipment calibration and operation;
- Local levels of service;
- Salt storage practices;
- Excess salt removal policies;
- Community education efforts; and
- Performance evaluation.


CRA
County Road Association
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WESTERN STAR
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