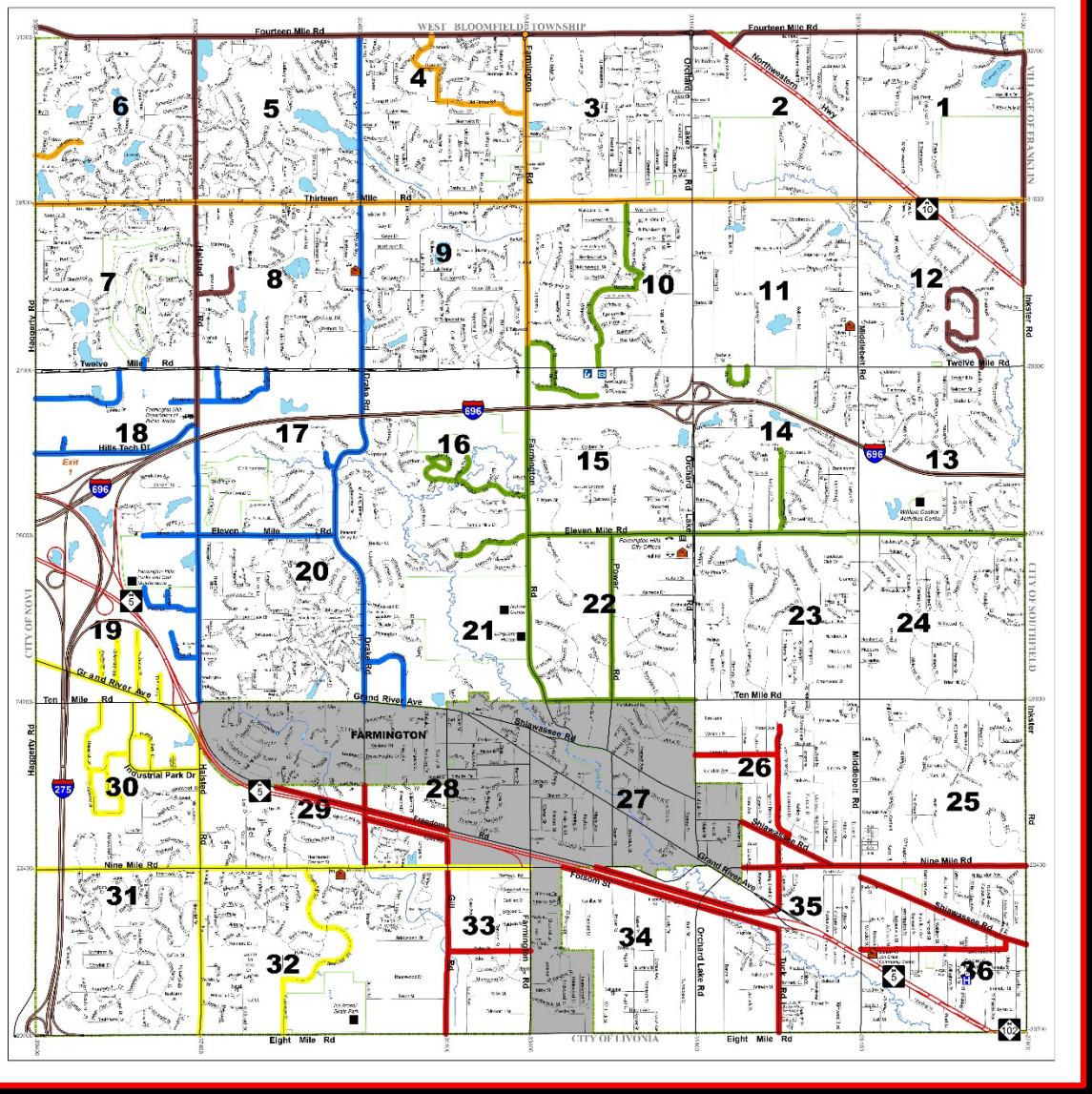
MICHIGAN **Winter** Operations Conference



2026 CALIBRATION *Woes*



FH's Road Network

- 180 Ln Miles of Major Road
- 490 Miles of Residential Road
- Includes 20 Miles of gravel
- 670 Lane - Miles

FH's Calibrating History





- **Started Calibrating in 2006**

Winter Maintenance/Best Practices

- Before the beginning of each snow fighting season, salt trucks must be calibrated to ensure salt distribution falls within department guidelines. The calibration should be rechecked if there are any mechanical adjustments or changes throughout the remainder of the snow fighting season. A must for safety of the public, consistent goals, target application rates and environmental sustainability .

ie: Clear Roads

Calibration Program-Why

- Would you trust a pacemaker that's not *calibrated* before it inserted into your heart?



- Would you trust a hydrometer/refractometer for salt brine concentration that's not *calibrated* to produce the correct salinity 23.3%...!!



- Would you trust your torque wrench to be accurate/*calibrated* on the fleet or your family's vehicle….



Single Axle/5 TONS - SALT= $350+



EVERYTIME YOU LOAD UP !!

Tandem Axle - 10 TONS of SALT= $700+





EVERYTIME
YOU LOAD UP !!

$$$$$$$$$$$$$$$$$$$$

30% to 45% Budget

For the average year for Winter Maintenance

Diminishing Return on Budget other than Public Safety-Commerce-Quality of Life !

Credit: DWClonch,LLC

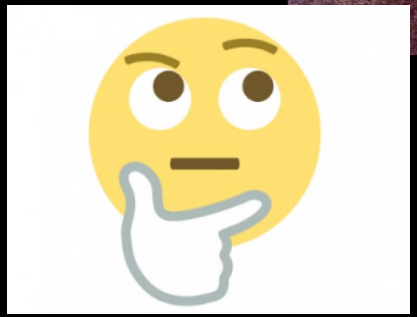
Level Of Service











Same pounds per lane mile-Local vs Majors??

Woes

Woe is a noun and exclamation **meaning great sorrow, deep distress, or serious troubles and problems.**




SAFETY
FIRST

Communication/Same Page





Equipment/Hydraulics don't care ☹







Long cable to get the Controller out of cab-<u>if you can</u> ☺



Long cable to get the Controller out of cab



Support from Vendors – Manufacturers / Neighbors





Wixom-brine/Novi-wings

TRAINING



Vendors



Potlucks

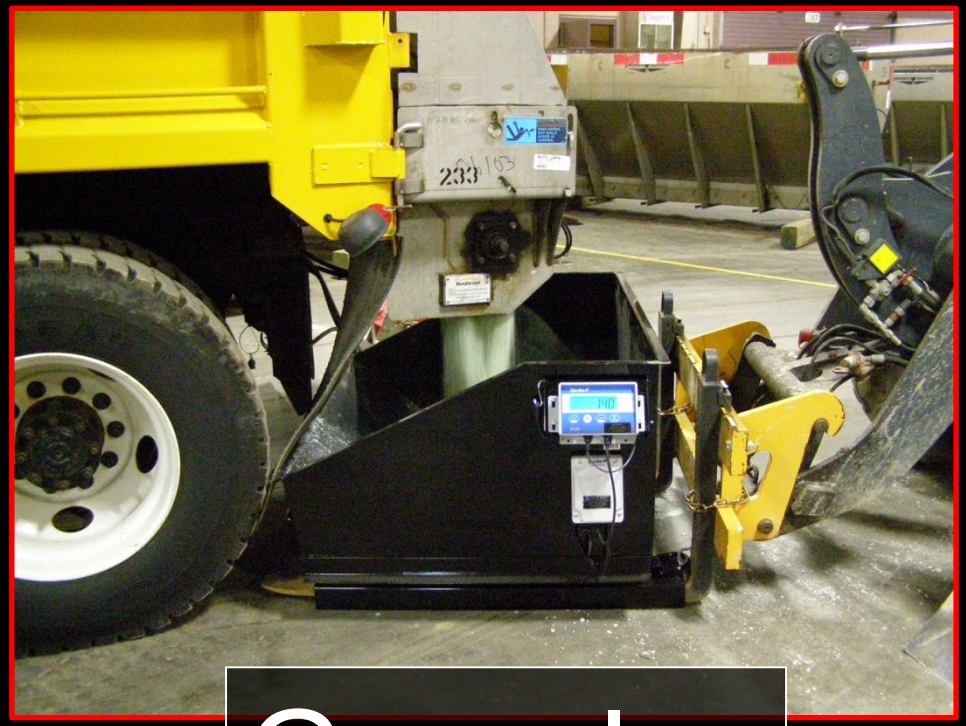


Workshops

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CALIBRATION



Granular



Liquids

Tools/Equipment Needed

- Well Maintained Truck/Slip-In/Tailgate Auger, Vee-Box, Live Bottom etc …
- Fluids in normal operating range &Temp.
- Scale(human, hunting etc.)
- Bucket
- Tarp, Shovel, Wood, clipboard, forms, watch, calculator (Smartphone)
- Salt, Sand (materials)
- Operation manual of specific equipment

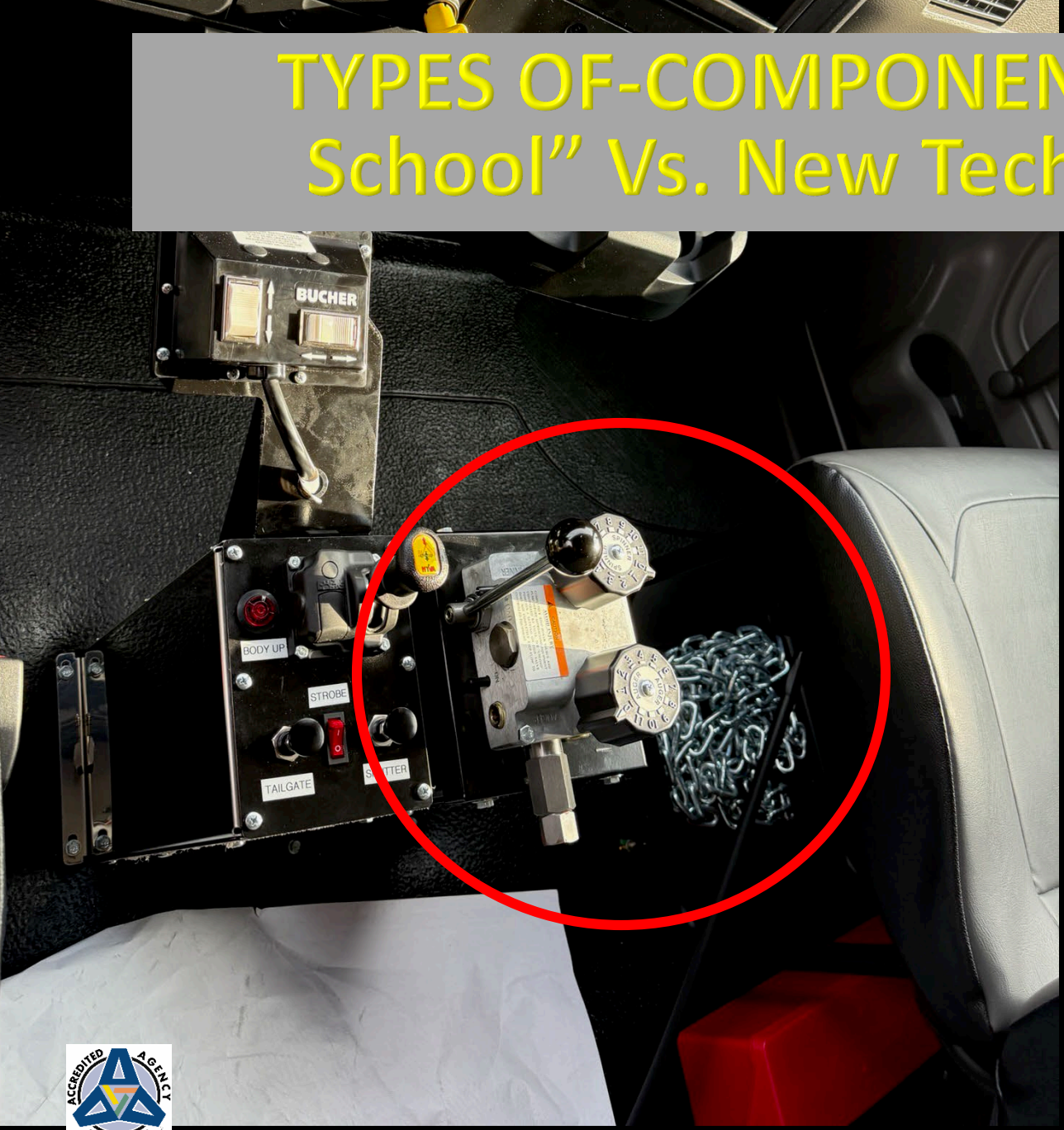






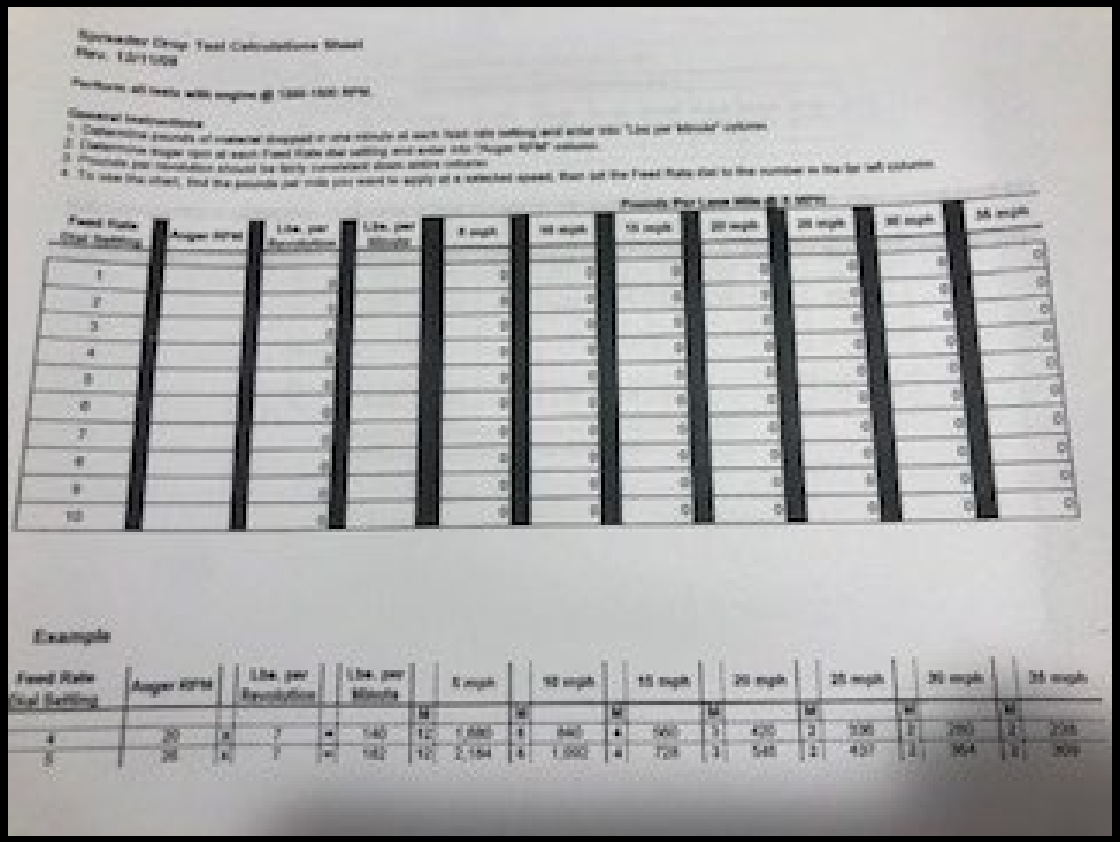


TYPES OF-COMPONENTS “Old School” Vs. New Technology



- Manual controllers ON/OFF, Dial 1-11
- Equipment SPEED is Crucial

Tools Needed





Calibration charts for Manual & Automated Controls

Tools/Equipment Needed for Liquids





Overlooked CALIBRATION



Wing

Underbody Scraper

Front Plow

Calibration of Joystick for “Feel” & Control





- Controllers / Joystick has multi functions-speed-feel

Calibration Video – Joystick



Overlooked CALIBRATION







Road Temperature Sensors

CALIBRATION



Infrared Devices to measure pavement temps. (Pavement)



Big difference 31 – 33 degrees…

CALIBRATION-MD30



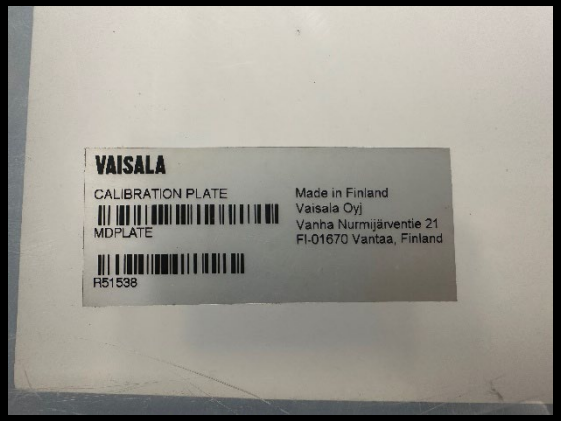
Pavement Temp, Friction etc…

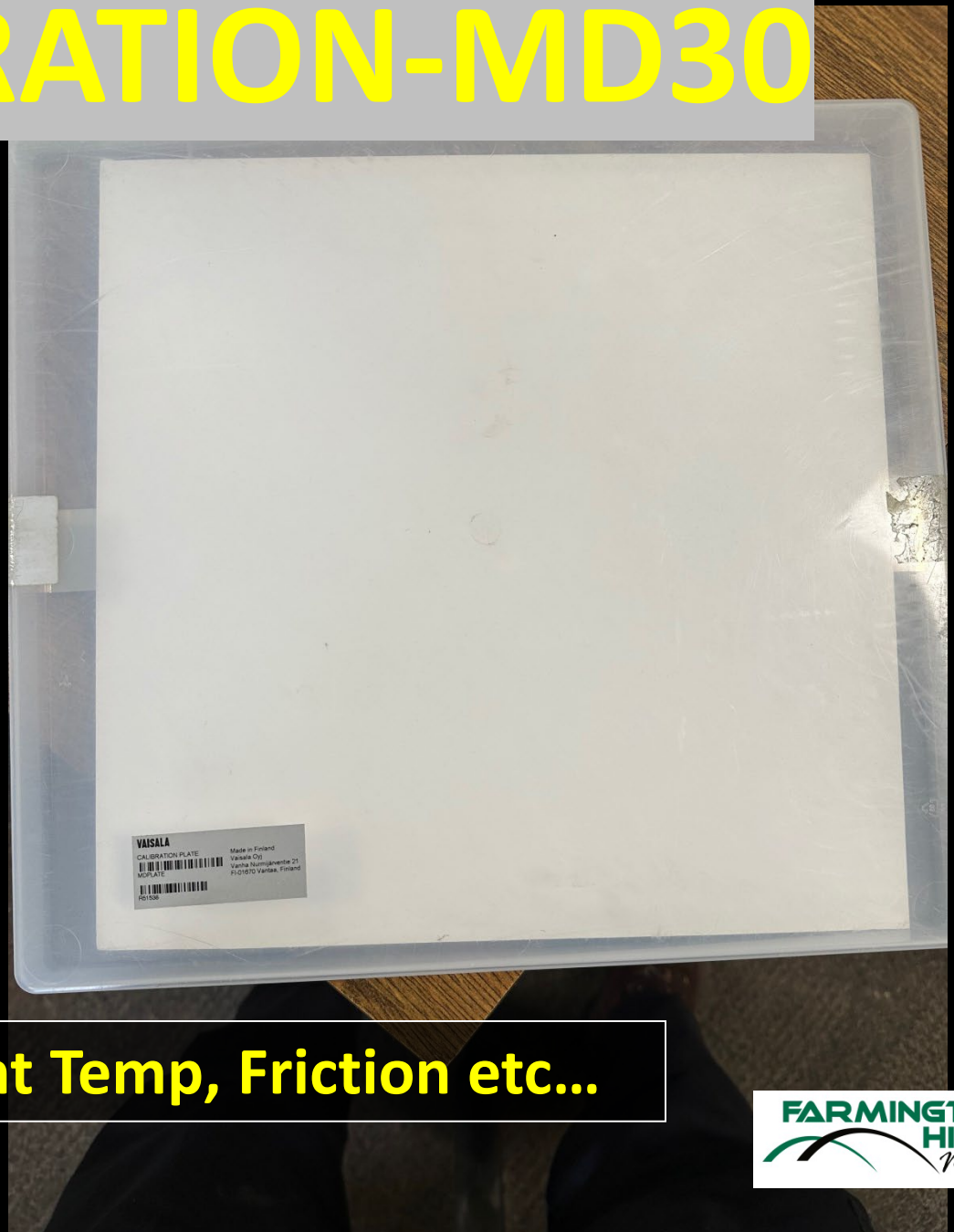
CALIBRATION-MD30



Pavement Temp, Friction etc…

CALIBRATION-MD30





Pavement Temp, Friction etc…

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Calibration-Woes

Taking/Making time to do it..





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Equipment Readiness



Equipment Readiness

- **Get the equipment ready for Winter Season / Calibration**



PRE-WINTER CHECKLIST--Truck #_____

	PLOWS	NOTES
	Welds	
	Shoe adjustment/blade adjustment	
	Wear on blade and shoe	
	All nuts tight	
	Hook plow onto vehicle	
	Hydraulics:	
	Couplers—cylinder	
	Set pins on plow	
	Match plow number to truck	

	TRUCKS
	Grease all fittings
	Hydraulic leaks—couplers--hoses)
	Welds
	Lights (all).Mirrors –Backup Camera (if equipped)
	Tires (wear)
	Heater. Two-Way-Radio
	Pre-Wet Tank Primed(If Equipped)-Calibrated for proper Gallons Per Ton
	Winter Gauges (“Low Liquid Indicator” “Road Temp.Gauge” Etc.)

	AUGER/BELT
	Bearings
	Grease
	Hydraulics—couplers--hoses
	Spill plates
	Spinner—Calibrate Anti/De-Ice Tank (if equipped)
	Proper adjustment for salt—Calibration for pounds per lane mile
	Spinner light

	REVIEW WITH MECHANIC

_____ _____

Equipment Operator Signature *Date*

Document … MS4 permit/Audits



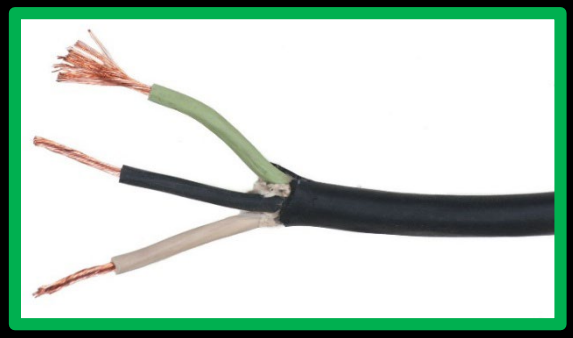
REVIEW WITH MAINTENANCE STAFF

Various Types of Controllers



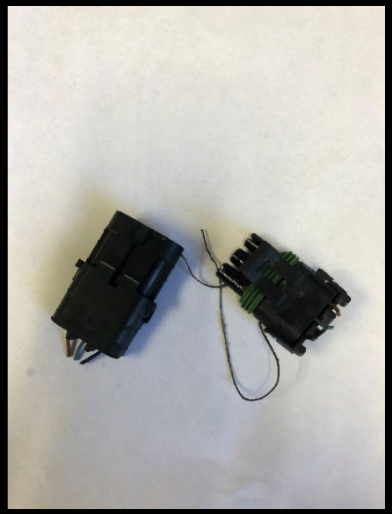
- (Calibration Mode)
  You may need:
  -Thumb Drive or Program Key
  -Pass Code
  -You do need:
  -Manual
  -Product Support/Rep Neighbors etc.
  -Manufacturer-You Tube

Connections-Green Wires





Connections-Green Wires





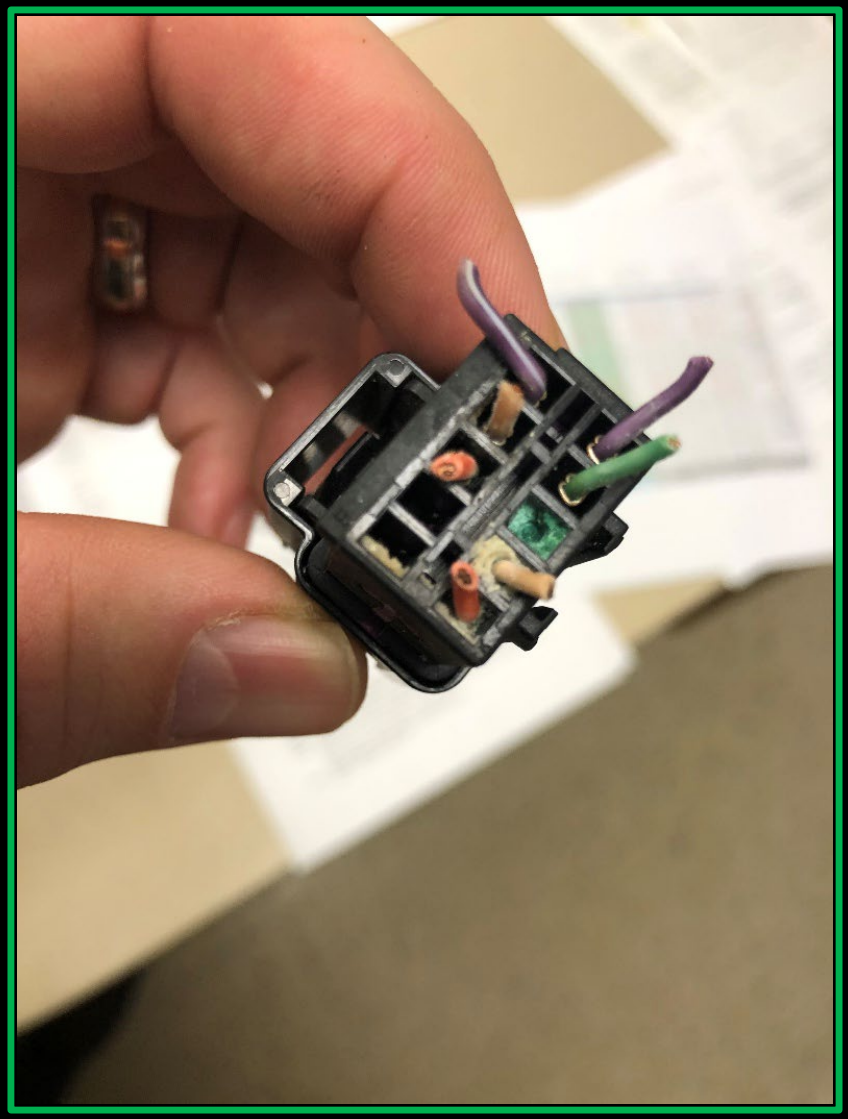
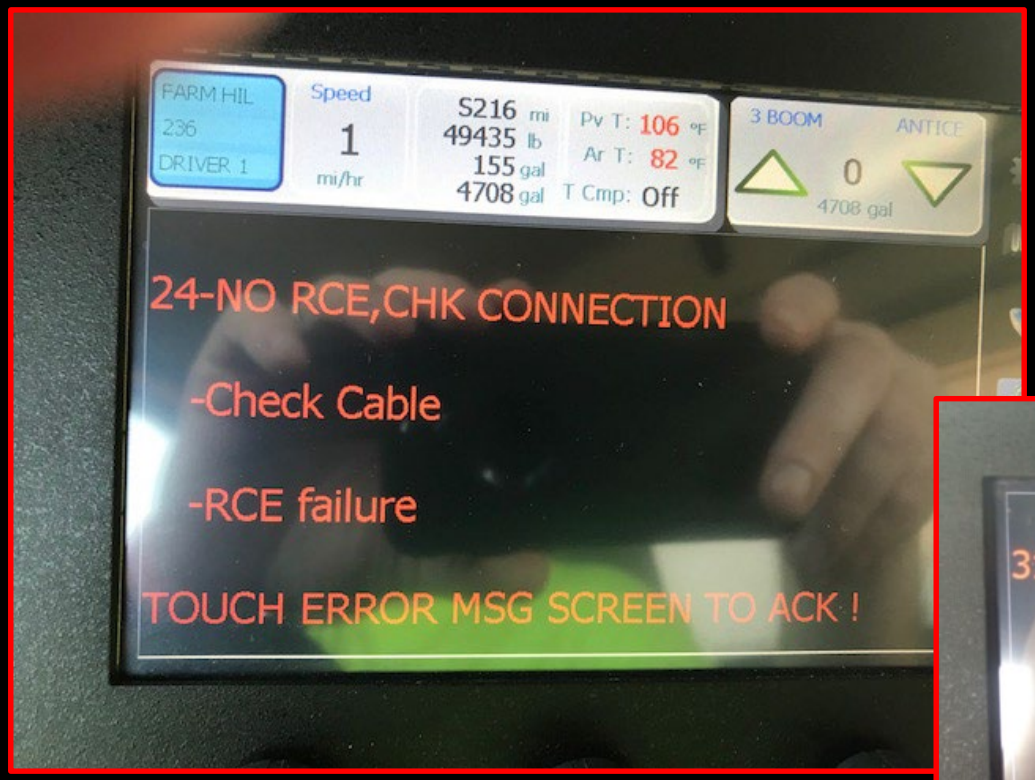
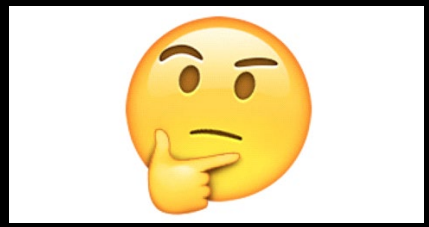
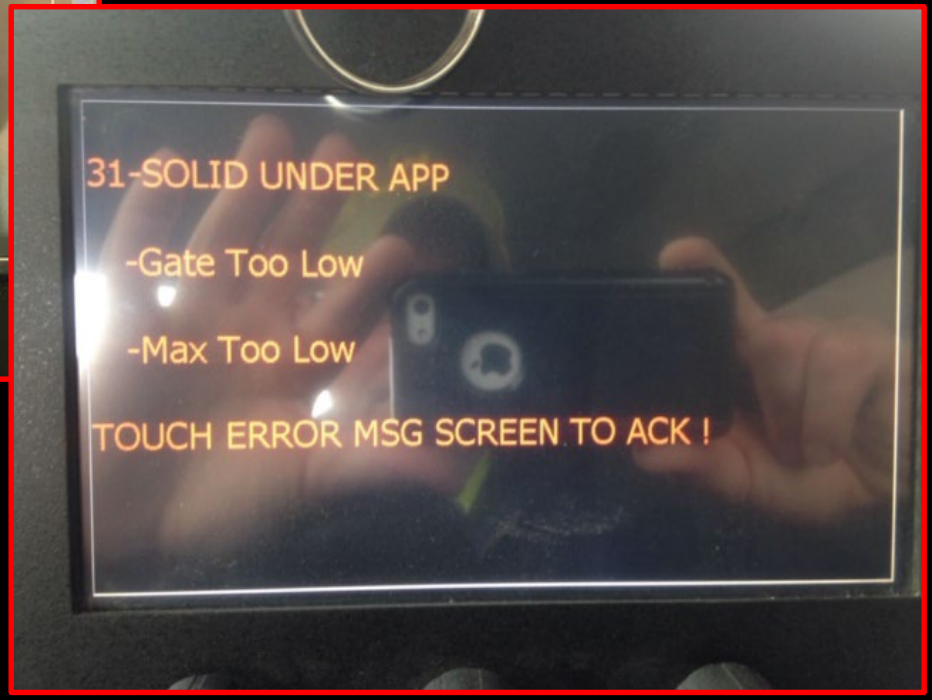


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Calibration-connection Woes







- **Error Messages**
- ***Ding*** **of Death ☹**

Controller Settings

- **CLOSED LOOP**
- **OPEN LOOP**

- **Running in Manual??**



Feedback Sensors Vary by Manufacturer –Auger Shaft-Chain





Drop Tailgate Spreaders/Augers

- Huge Difference in a 6” vs. 9” Auger
- May have some issues achieving lower rates (200#’s plm) at slower vehicle speeds.



MATERIAL SELECTION for CALIBRATION

- Abrasives (Sand, Grit , Millings etc.)
- Granular (Rock Salt, CMA etc.)
- Liquids (Salt or Well Brine, Calcium, Mag. Etc.)
- *All materials-liquids flow and spread differently*
- Most Controllers have multiple selections for different materials / mixes-if manual controller use separate calibration sheets….

Sand vs Rock Salt vs Treated Rock Salt



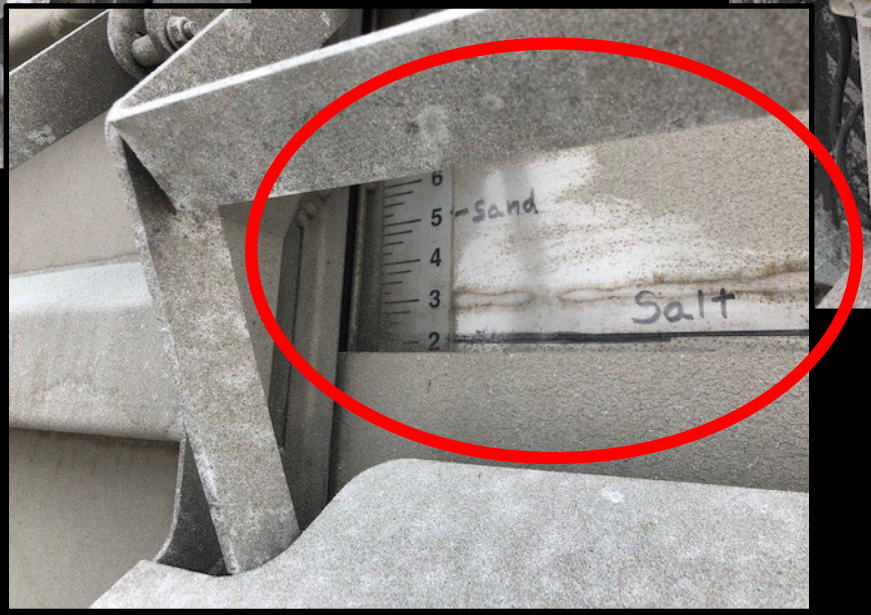
Different flow and weight to consider when calibrating different solids – grit, ash etc.

Live - Bottom Sanders-V Boxes

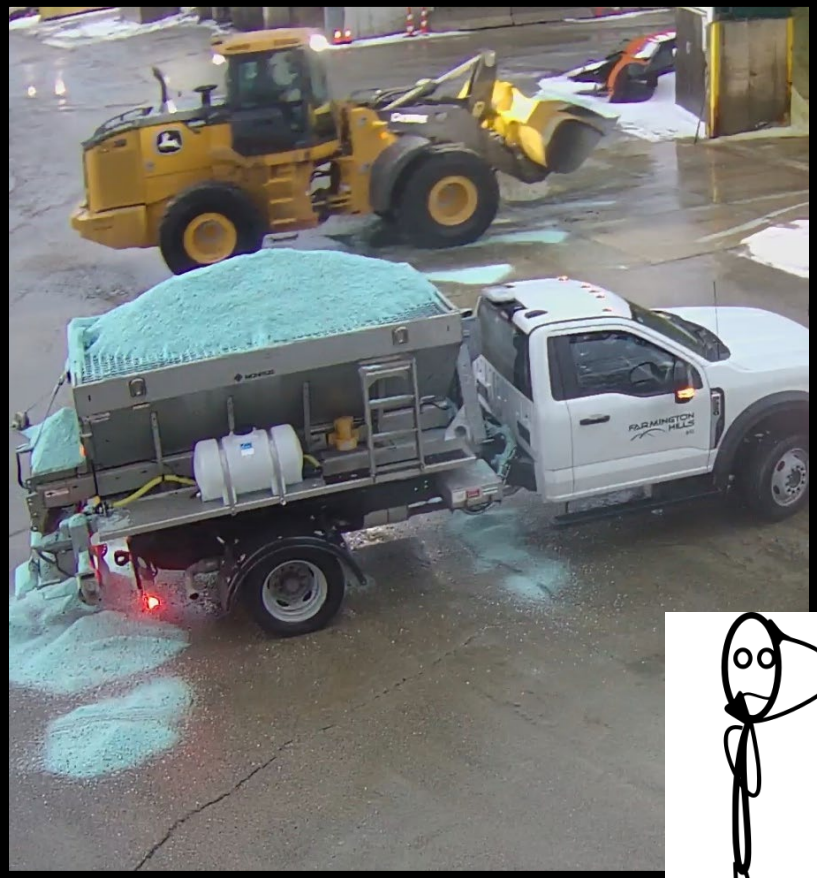


- Huge Difference in adjusting rear door for material flow-#'s

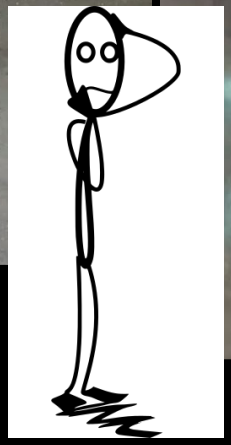




Auger/ Belt Charged







CALIBRATION-Liquids Woes



Pump On / Off



Calibrate Liquids w/sizing of tips & nozzles (Volume/Flow)

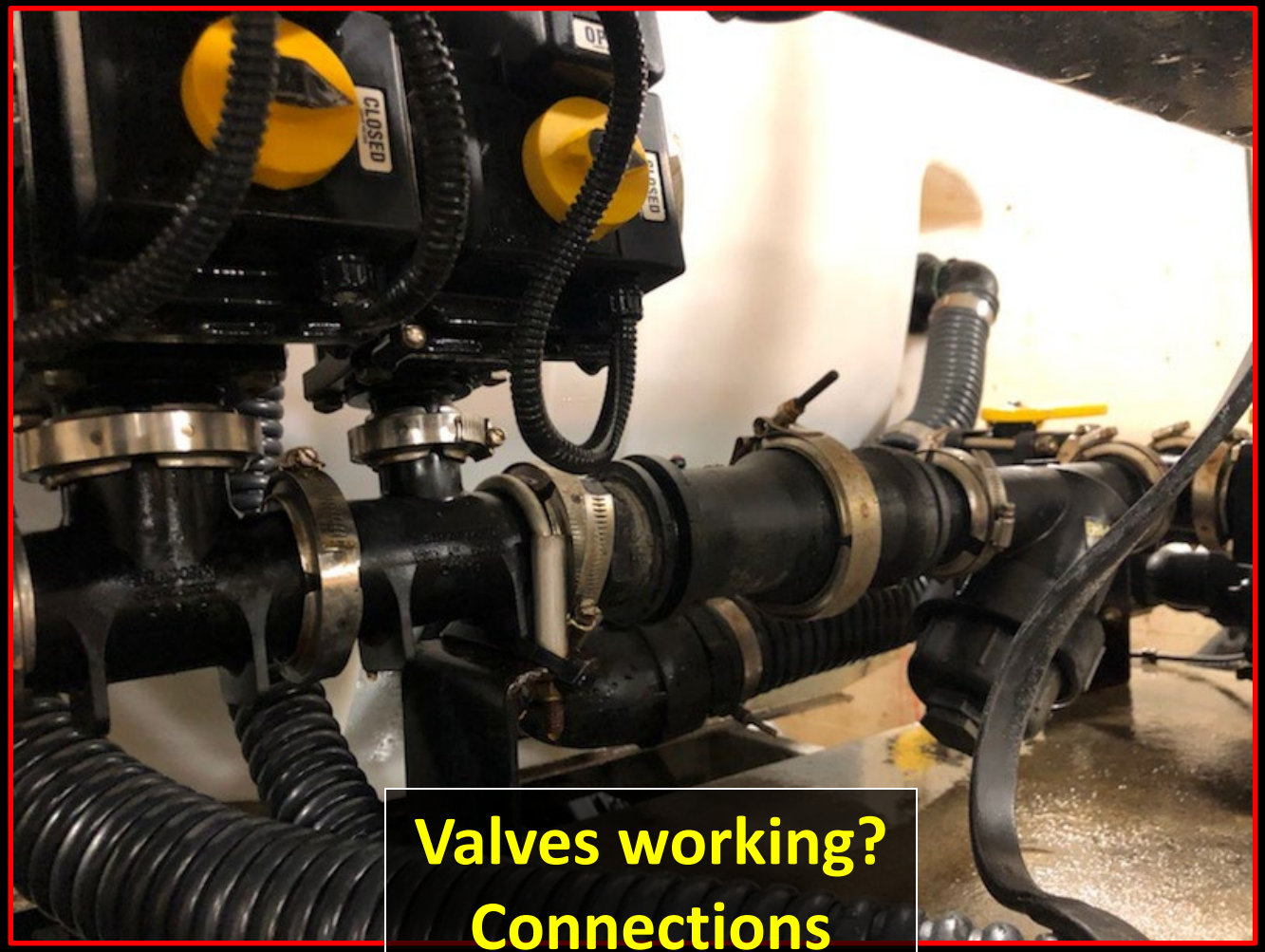
Components/Enclosures Vary by Manufacturer





Flush-Grease-
Maintain-Verify
Operation-
Safety

Liquid Valves Vary by Manufacturer

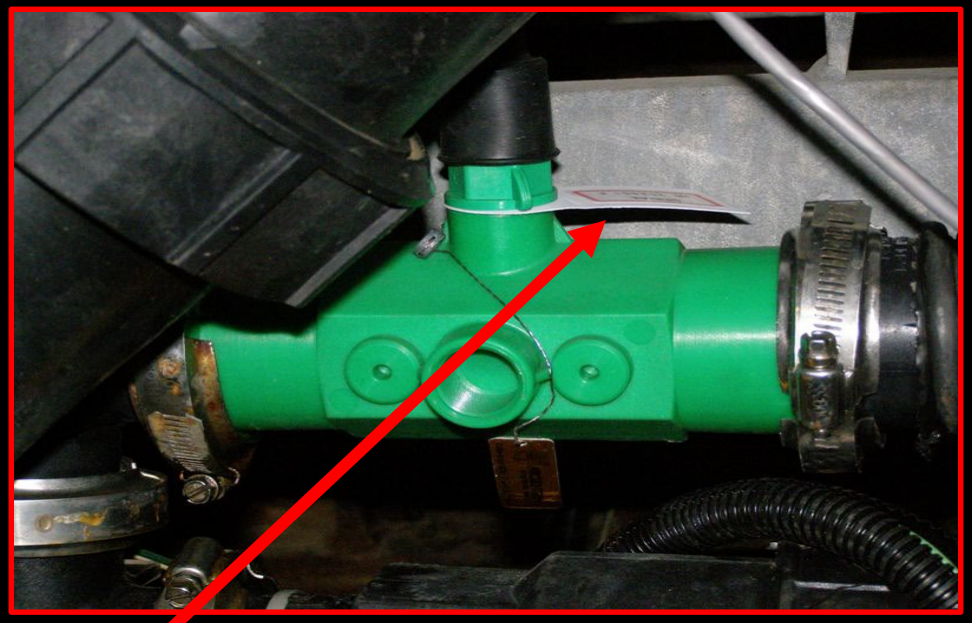


Valves working?
Connections
GREEN?

Video - Liquids Calibration



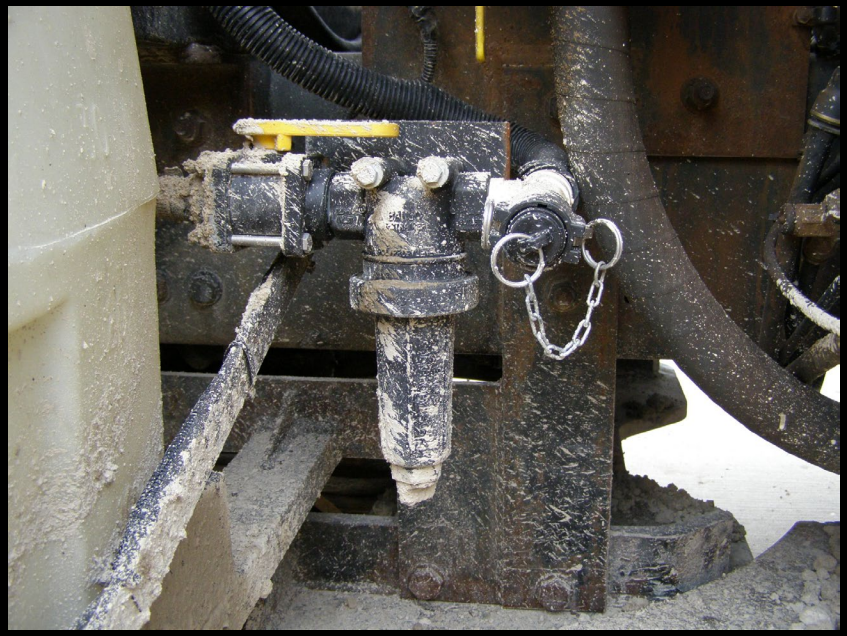
Various Types of Flow Meters





Tags on Flow meters-Info for controllers

Liquids Strainers/Filter Maintenance for flow

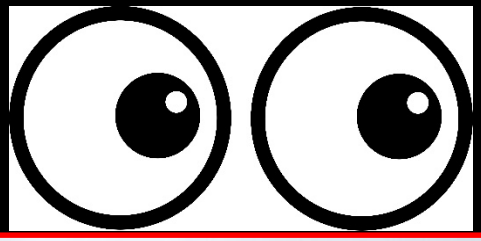




Calibration-Grid Test



Utilize a paved area for a grid
Consider safe speeds in testing





Operators run and watch the tests

<u>Visually</u> see for themselves…What does 300vs500 #'s PLM Look like-Speed-Dry/Pre-Wet

Visually 300#'s of Salt



Calibration Program-Why





- Best Practices – Environmental – LOS (Proactive)
- 6 Major Rd snow routes + Local Rd network
- 4,000 tons of salt annual avg. (was 8,000)
- 200,000+/- gallons of annual liquid usage

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WHY-How are you going to argue your point of too little or too much Material…….



Environmental Impacts

- Soil
- Animals
- Vegetation
- Water
- Air
- Human Health







Credit: DWClonch,LLC

"EGLE"

Michigan Department of Environment, Great Lakes, and Energy

Chloride and Sulfate Water Quality Values Implementation Plan 10/20/20 – Revised February 2021

"We've actually reduced by about half the salt spread rates on our trucks, from 400 pounds of salt per lane mile to 200 pounds of salt per lane mile," he said. Craig Bryson, spokesman for the Road Commission for Oakland County. Detroit Free Press April 2017.

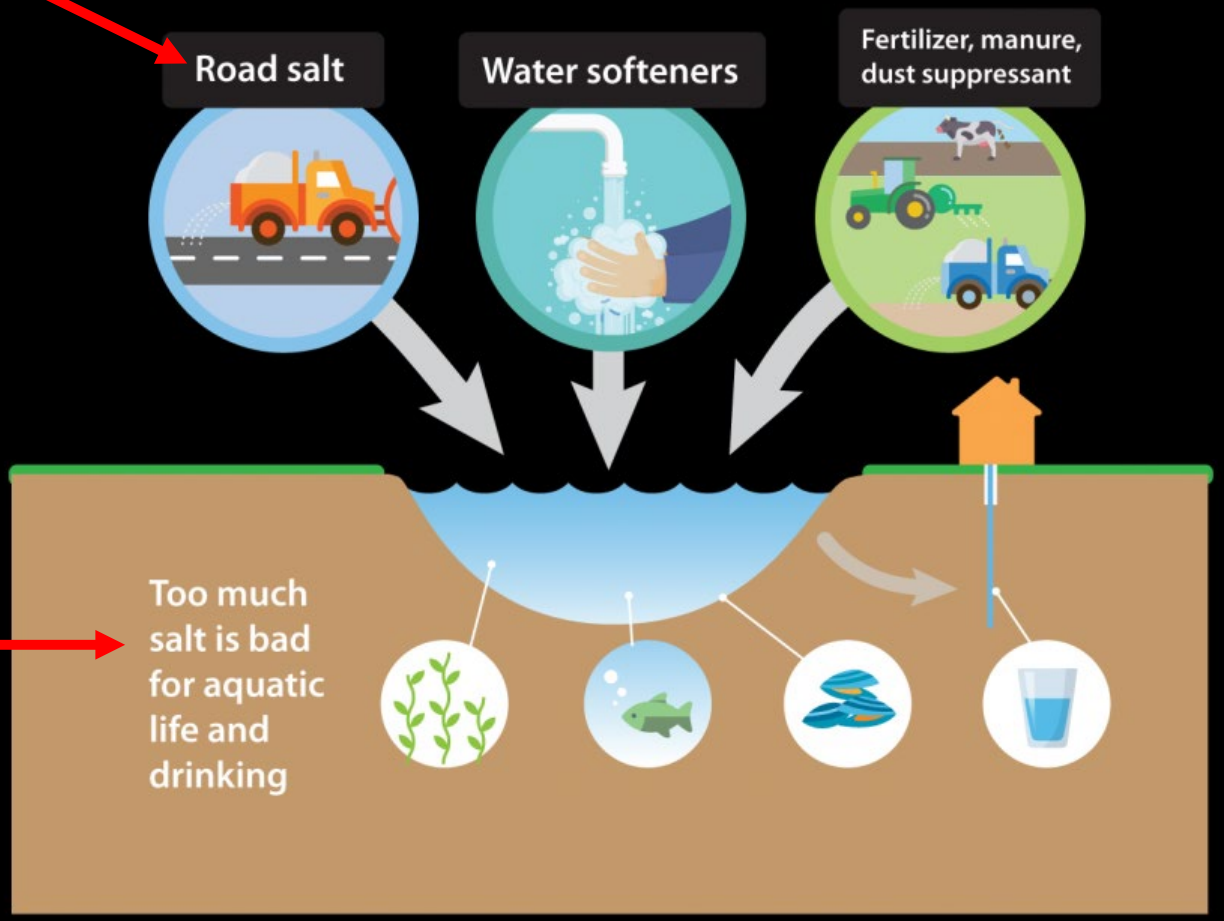
MS4 permits currently include requirements to reduce the discharge of pollutants associated with cold weather operations, including salt application, salt storage, and strategic street sweeping to remove excess salt. Based on recent data, the current procedures developed and implemented by an MS4 permittee may not be sufficient to address the impacts of existing and future elevated chloride levels on aquatic life.

EGLE
Audits-
2011-2024



- Calibration Records
- Salt/Chemical usage records
- MS4 Permit-Records-Sweeping of Salt/Sand etc
- Containment/runoff of salt/liquids etc

Team Effort



BEST PRACTICES

Calibration a TOOL IN THE TOOL BOX





Safety-Efficiency-Environmentally Friendly-
Budget$$

FH's Calibration Program-Why

"YOU DON'T KNOW WHAT YOU HAVE UNTIL YOU MEASURE IT"

A"Tool" to measure your Materials, Expectations, Level of Service

- Consistent LOS -Starting Point for Each Event , #'s per LaneMile, gallons per LM
- BUY IN / CHANGE / ACCOUNTABILITY/Better for the Environment
- Budget (Calibrating should save your agency $$)
- Level Of Service (Everyone on the Same Page from the top down)
- All Equipment not calibrated = bad info/data-ie:Pavement Temps
- Helps reporting Material usage for operators, inaccurate reports, Audits –MS4
- Testing Materials…. Baseline of calibrated applications at different conditions…
- Equipment Build (Staff Input), Technology, Maintenance & SUPPORT
- Ground Speed, Sensors=equipment issues, corrosion ☹ etc.
- Pre & Post Winter & Storm Meetings / Campfires (Feedback-Buy In)
- Resources ("Shared Services" scale purchase)
- Train, Network, Lean on your Vendors
- You can't Manage what you can't Measure!

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Your #1 Resource – The Team!







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QUESTIONS?

Thanks for your time ☺



