

LTAP WINTER OPP's Conference'14



Making Brine Simple



Bryan Pickworth
Road Maintenance Supervisor
City of Farmington Hills, MI
Dept. of Public Works

- 23 years as an employee of the City beginning as a Laborer in 1991, moving up through the ranks to Equipment Operator III/Crew Leader in 2001, and then promoted to Road Maintenance Supervisor in 2004.
- 2009 graduate of Michigan APWA's Michigan Public Service Institute

Current Responsibility's:

- Snow and Ice control , Liquids production, Stormwater drainage maintenance, Forestry operations, Landscape & ROW mowing maintenance, Irrigation, Gravel road and shoulder maintenance, Street sweeping and various other in-house & contracted services.



Single Axle/5 TONS- SALT= **\$240+**

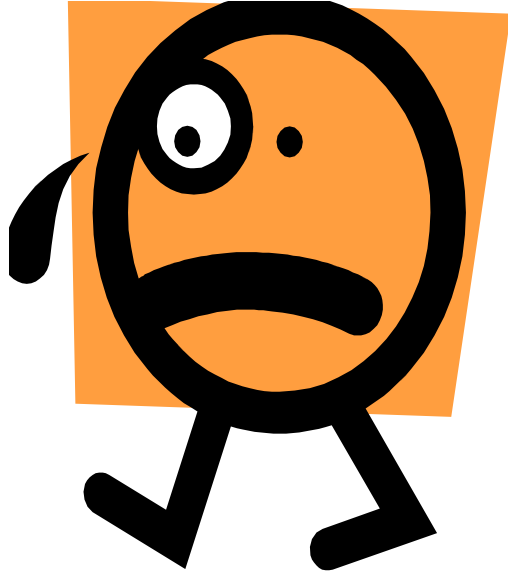


EVERY TIME
YOU LOAD
UP !!



**FARMINGTON
HILLS**
Michigan

Tandem Axle-10+ TONS-
SALT= \$480+



EVERY
TIME YOU
LOAD UP !!



**FARMINGTON
HILLS**
Michigan



(1) 5 YD cap.
Truck =4k Gal's
BRINE





(1) 10-YD
cap. Truck
= 8K Gal's
BRINE



**FARMINGTON
HILLS**
Michigan

BRINE MAKING/ISSUES

- Brine maker or supplier of liquids and granular materials
- **800-1K gal's of salt brine from 1 ton salt(cost/labor)**
- Additives, organics, blending
- Use what's available to you in your area
- Start out small/Simple-ask your neighbors.....



SALINITY – ACCURACY

- Salometer: Used for traditional measurements.
- Refractometer: Used for more accurate salinity, which automatically accounts for temperature, air bubbles and calibration which improves productivity. 2 functions-Saturation & Temp.



BRINE MANUFACTURING – Manual or Automated

- Initial equipment costs – \$ per gal, **labor**, water, electricity-- quality of salinity vs well brines
- Water supply crucial to manufacturing brine (3/4" vs 1-1/2"+)



Brine Cost's Farmington Hills DPW

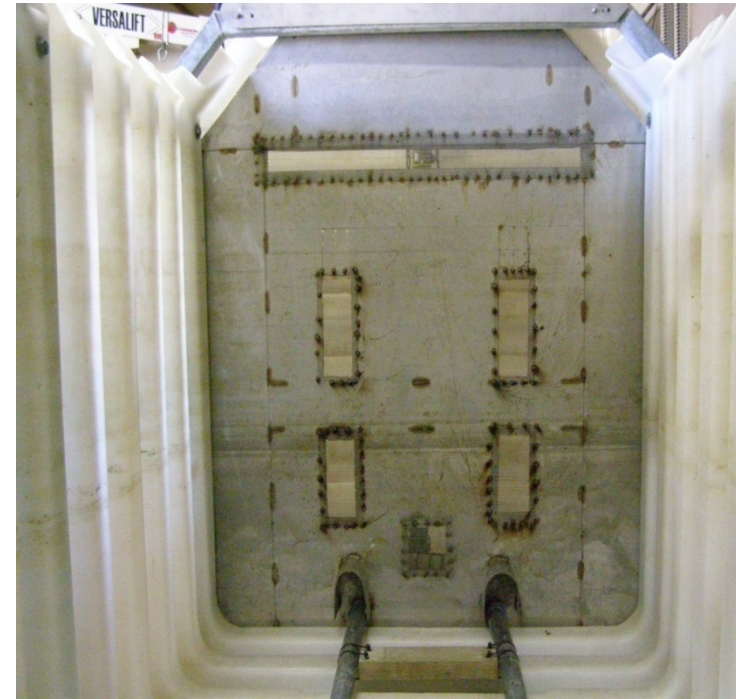
Winter 13/14

<u>Unit Costs</u>				
	\$/1000 cft	gal/cft	\$/gal	
Water	\$33.62	7.48	\$0.004	
	\$/ton	gal/ton	\$/gal	
Salt	\$46.51	900	\$0.052	
	\$/gal	\$/gal (15%)	\$/gal (20%)	
Beet	\$1.50	\$0.23	\$0.30	
			\$/gal (32%)	
Liq Calc. Chloride-Delivered			\$0.58	
	\$/hr	gal/hr	\$/gal	
Labor	\$44.11	1000	\$0.044	
Operator 2 – loaded (electrical costs etc.)				
<u>Pure Brine Cost</u>				
		\$/gal	\$0.10	
<u>85/15 Blended Brine</u>				
		\$/gal	\$0.31	
<u>80/20 Blended Brine</u>				
		\$/gal	\$0.38	

TOOLS IN THE TOOLBOX

INNOVATIONS-BLENDING

- Designed and built a blending manifold, including a Flow Meter, Anti-Foam/Test Port
- Modified our Brine Maker for quicker evacuation



Mixing Organics

- Below the surface of liquid (use Anti-Foam)



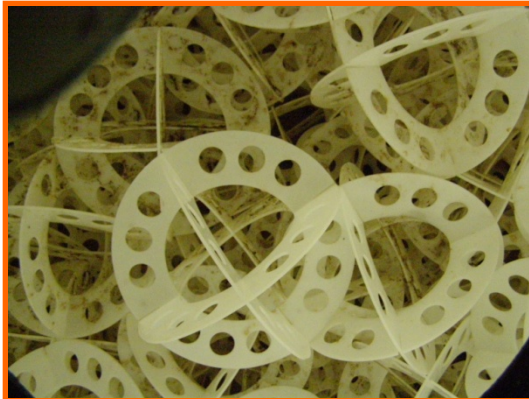
- Not below the surface of liquid



ANTI-SURGE TOOLS

BLENDING CONSIDERATIONS

- Spheres or Balls to increase safety, minimize driver fatigue, wear & tear on hauling vehicle
- Blending options, barrels, totes, bulk delivery, pricing



TANK FITTINGS for recirculation- PUMPS-hp, electric motors, backups



STORAGE – CONTAINMENT

(Maintenance Issues: Inside-Outside-Roofs)



FILTER/STRAINER ISSUES



50/60 Mesh (calcium) to 12/16 Mesh for organics-solids



ALLWAYS USE FILTERS



NETWORKING-ROADTRIP



TRAINING



NETWORKING-TEAMWORK

- The City of Farmington Hills formed a local **Winter Maintenance Team** made up of representatives from southeast Michigan communities to network, collaborate, and learn about new techniques. The Committee meets regularly to hear from vendors and private contractors about new products and methods. It gives participants the chance to see what is working for other communities, establish goals, view research, and collect data. The team moves the meeting site to different facilities each time.



RESOURCES-NETWORKING- TEAMWORK

- Local LTAP, APWA,CRAM, MDOT, SEMCOG, Winter Maint Groups throughout the state
- Network with your “neighbors”
- Attend or view conferences, seminars, webinars, local meetings
- YOU-TUBE
- <http://www.clearroads.org/>
- <http://www.saltinstitute.org/road/snowfighting/>
- <http://www.apwa.net/>
- <http://www.semco.org/>
- MI DOT, IOWA DOT, OHIO DOT, MINN DOT, COLORADO DOT.....

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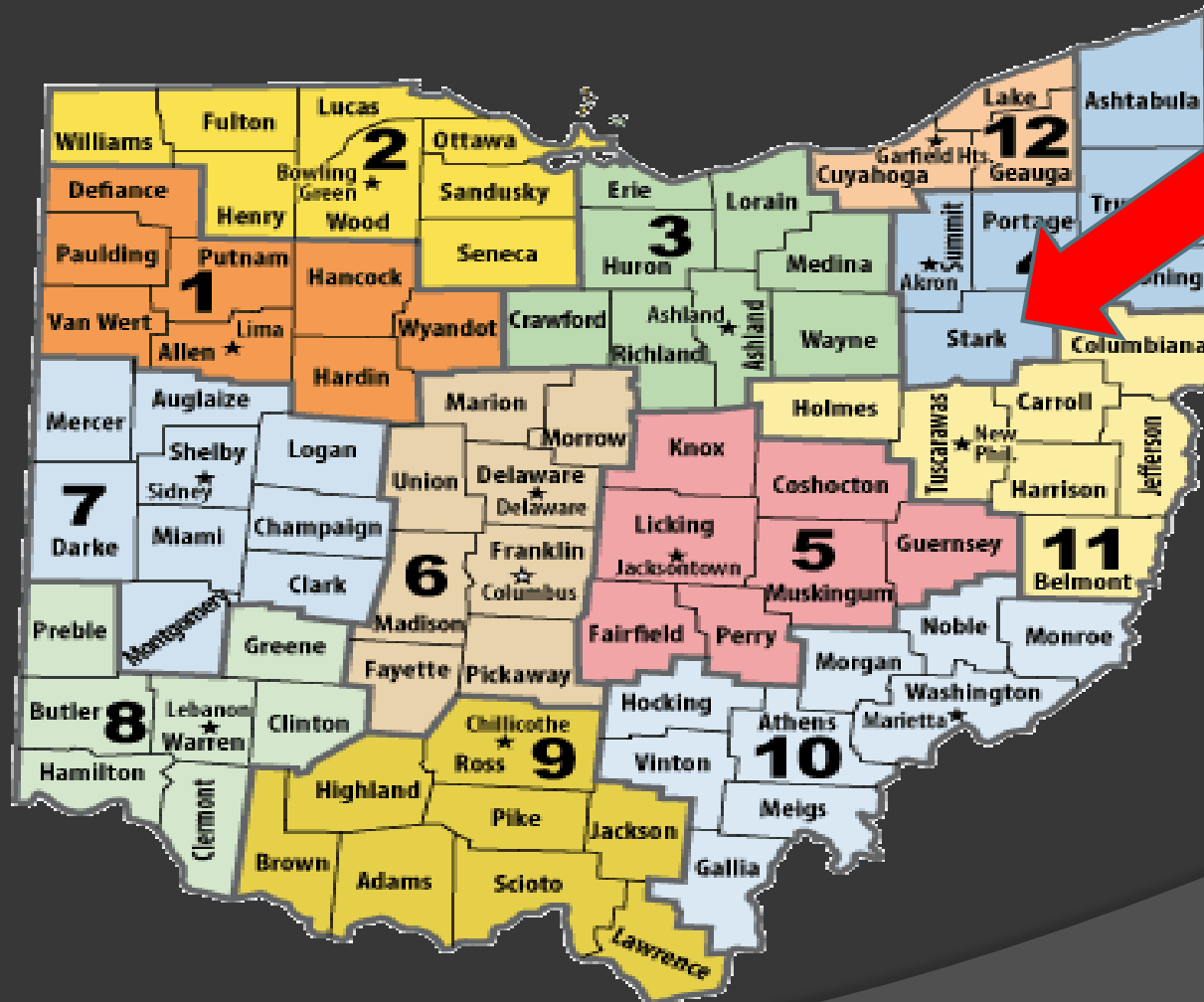




OHIO DEPARTMENT OF TRANSPORTATION

JIM MILLER
ODOT- DIST. 4

ODOT DISTRICT 4



SNOW TOTALS AND EVENTS

2013-2014

- ◎ CLEVELAND - 113"
- ◎ AKRON – 94"
- ◎ COLUMBUS – 55"
- ◎ CINCINNATI – 43"
- ◎ CHARDON(OHIO SNOW CAPITAL) – 185"
- ◎ CANTON – 79"
- ◎ **TOTAL EVENTS = 46**

NETWORKING-ROADTRIP



OHIO & MICHIGAN

- ⦿ CAN COLLABORATION REALLY WORK???
- ⦿ POSSIBILITY OF SHARED SERVICES
- ⦿ IT'S ALL ABOUT TEAMWORK
- ⦿ CREATE A LARGE NETWORK OF SNOW AND ICE PROFESSIONALS
- ⦿ DEVELOP RELATIONSHIPS ACROSS NATURAL BOUNDARIES
- ⦿ KEEP AND OPEN MIND!!!!!! ANYTHING IS POSSIBLE!!!

**WE ALL HAVE TO START
SOMEWHERE!!!!**



ODOT PARTNERING

- ⦿ CITY OF ALLIANCE
- ⦿ CITY OF CANTON
- ⦿ JACKSON TWP
- ⦿ LAKE TWP
- ⦿ CITY OF NORTH CANTON
- ⦿ CITY OF MASSILLON







ODOT STARK















JIM MILLER TRUCK



DIRECT APPLICATION



JET STREAM







8230243



SNYDER
Industries, Inc.

The Expert Difference is Safe.

MAKE A SLURRY MIX



PRE – TREAT MULTI LANES



EPOKE



ODOT TRAILER



WHEN IT'S NOT SNOWING!!!!



Overview

History of Brine and Brine Making

New Technologies

Mark DeVries

**Retired - McHenry County IL
DOT**

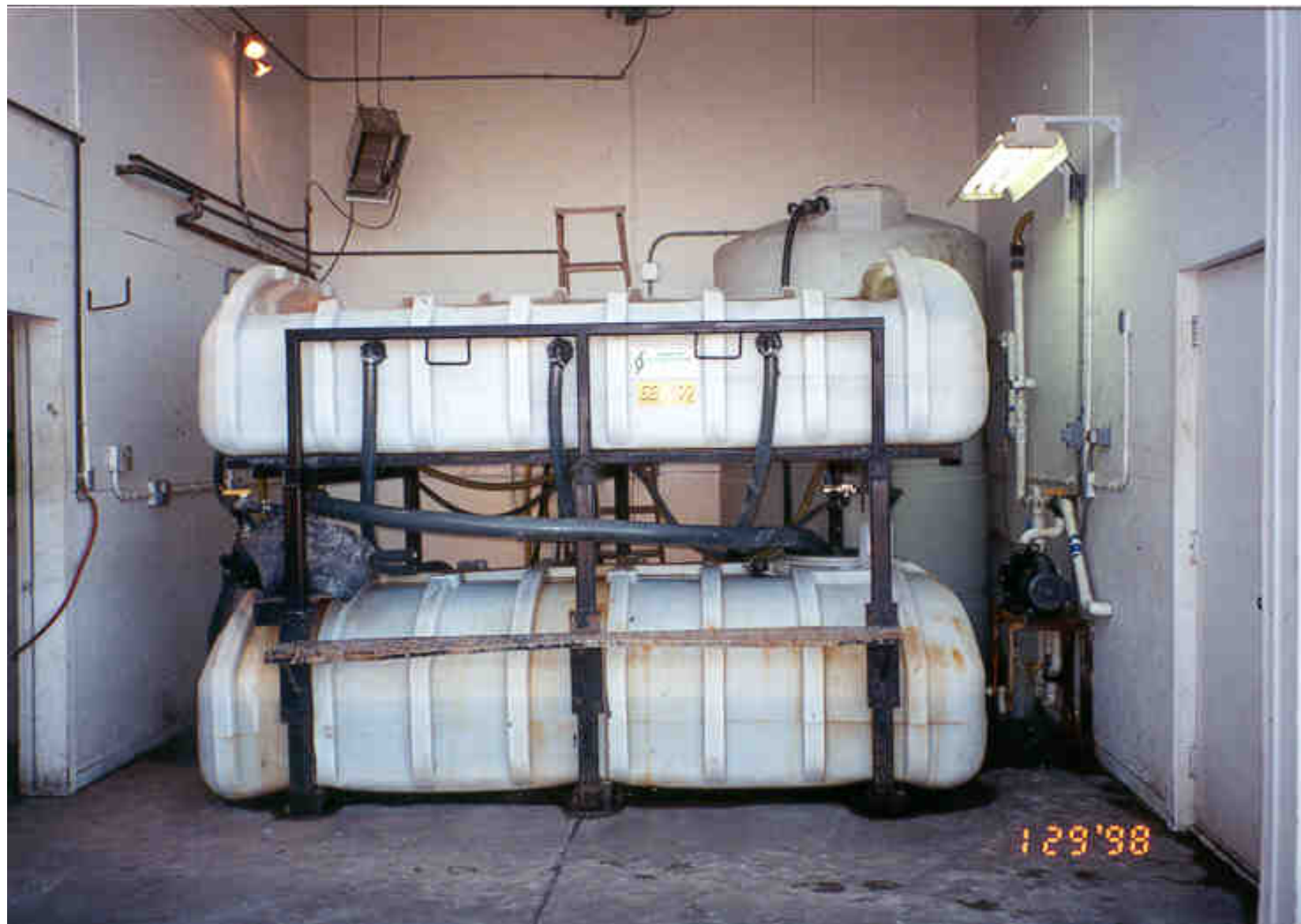
You are already making brine



The Beginning – Brine Makers









THERE ARE MANY DIFFERENT TYPES AND PRICE RANGES







Traditional brine facility





BRINE MAKING



BRINE MAKING IS EASY AND COST EFFECTIVE



AERATION UNIT TO SPEED UP PRODUCTION





Brine Making

Housed in same building as solid chemical

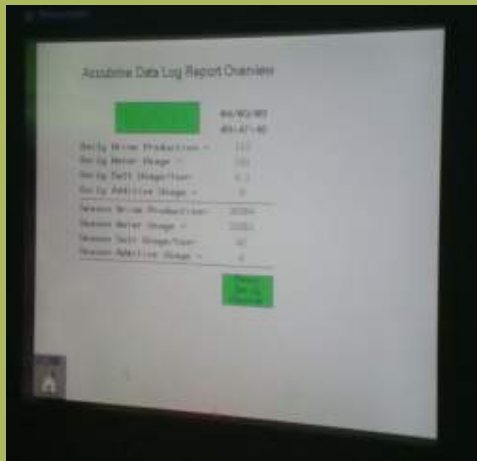
Indiana DOT - Greensberg



Control Room



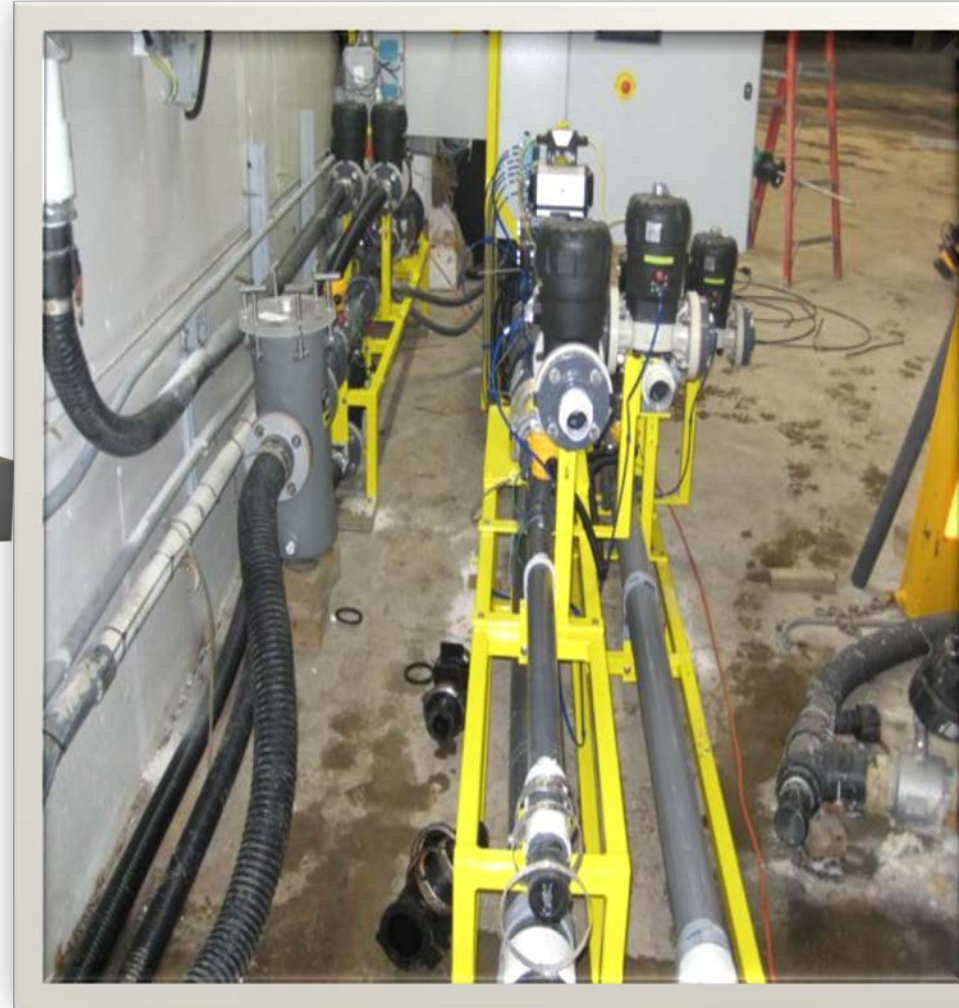
*All automatically controlled,
touch screen actuated, with
printouts of production*



Accubrilne Data Log Printout



Newest Brine Maker



THE SIMPLEST SYSTEM I HAVE
EVER SEEN



Cleaning Out The Mess

McHenry County, IL



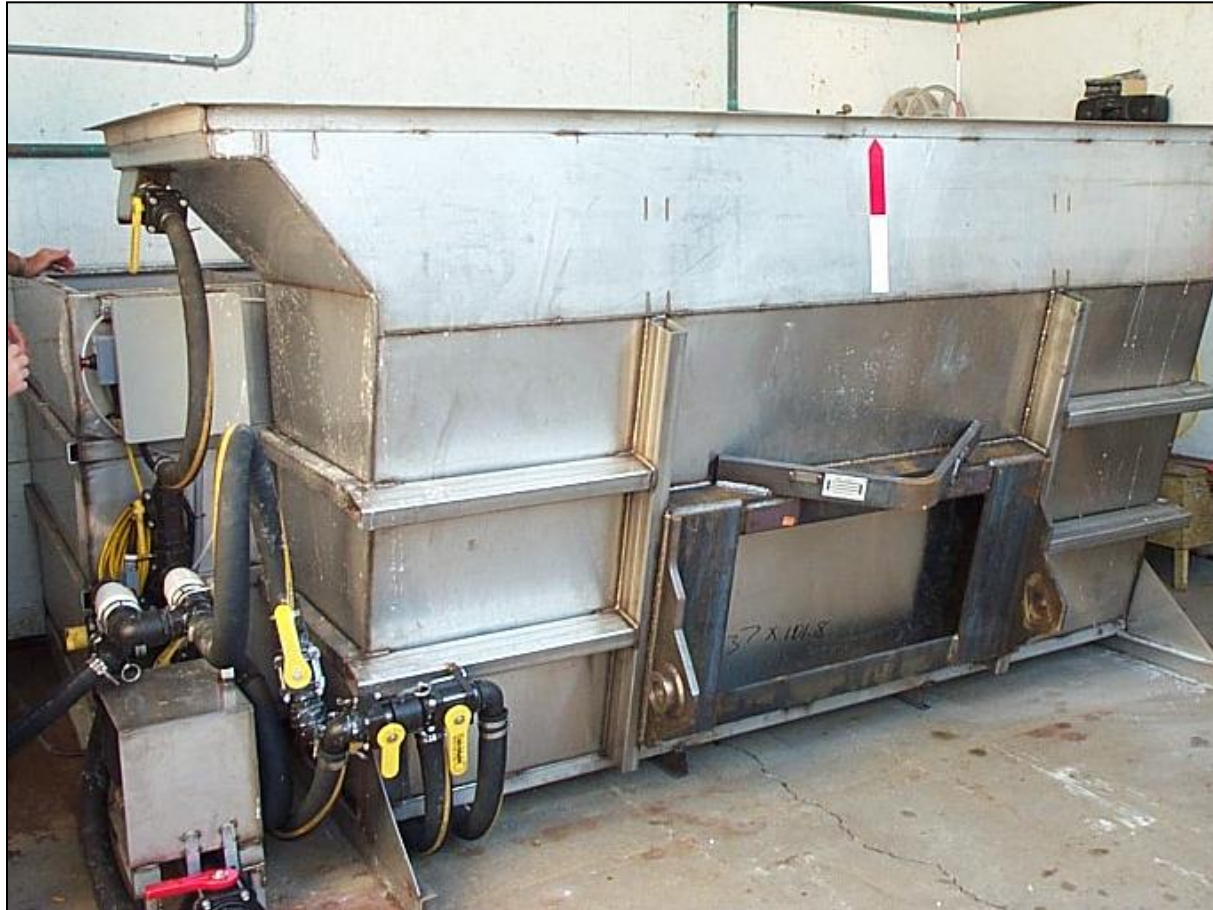


McHenry County, IL





Stainless Steel Brine Maker Fitted With ACS Coupler



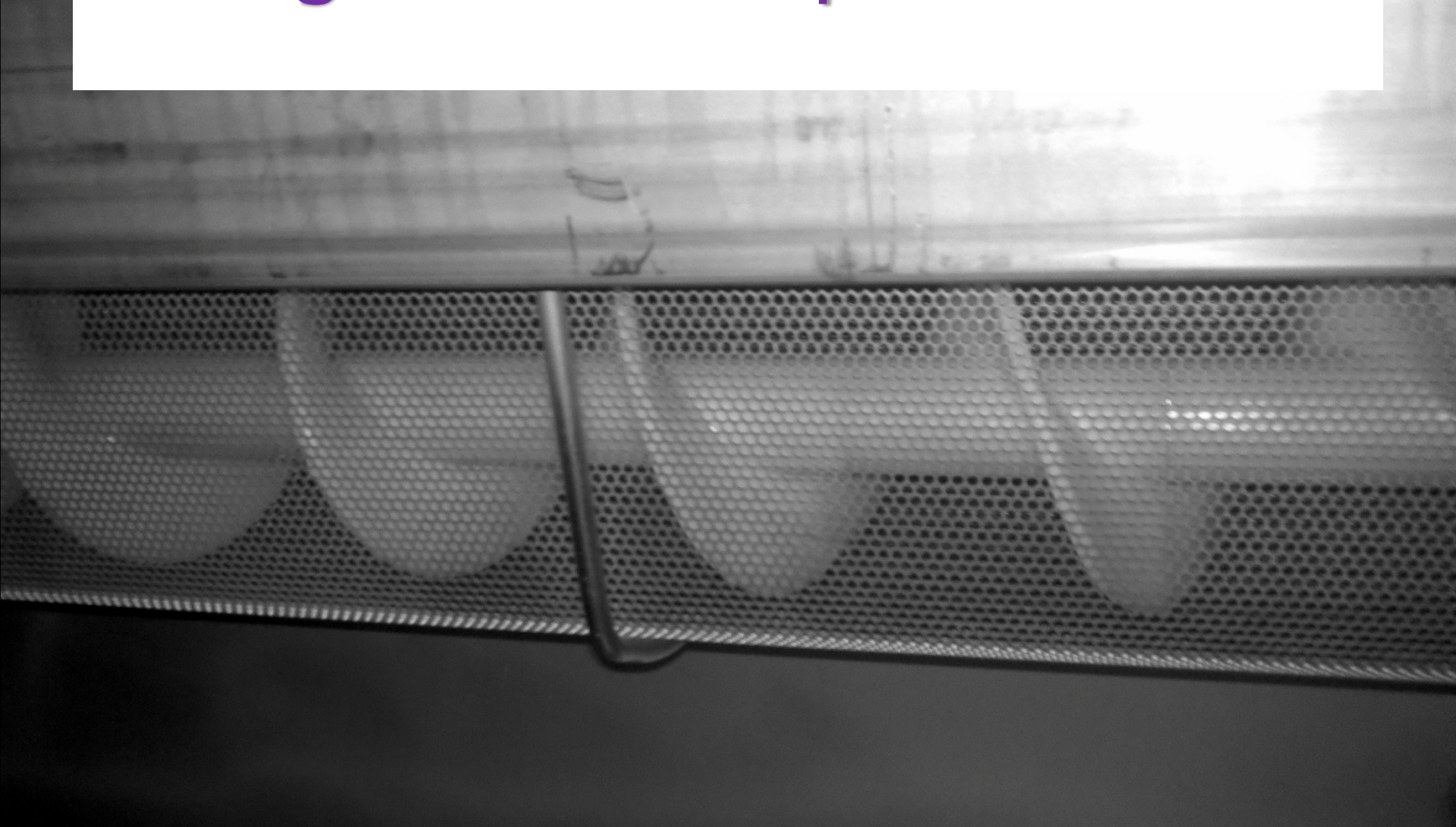


Self Cleaning

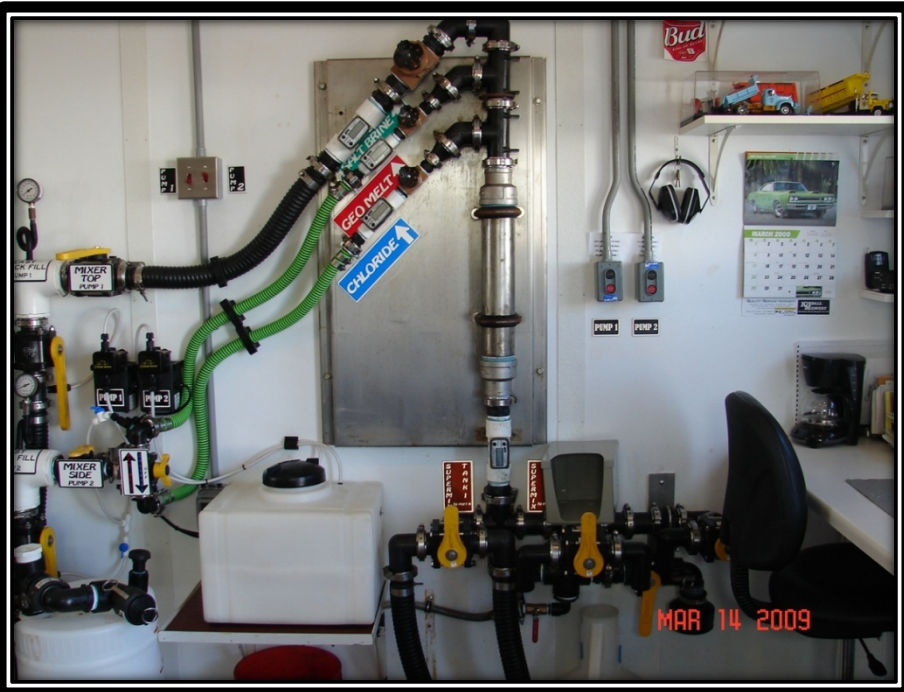




Augers out Deposits

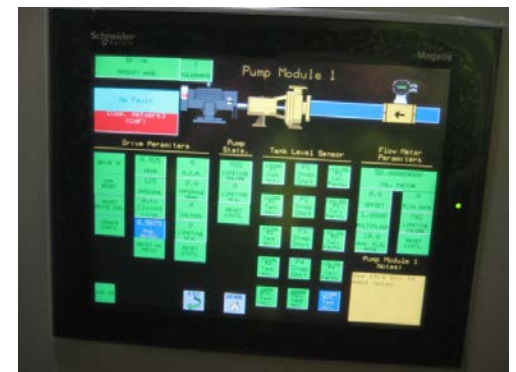


ADDITIONAL VALVES AND NEW 3" FILL PUMP



Latest Blending System





	USER I.D	USER NAME	USER ENABLE	MAXIMUM VOLUME	AUTO/ MAN	FLOW RATE	Brine	Carbohidr ate	CaCl	off ch 4	OFF ch 5	FILL FREQUENCY
1	123	gary	ON	1650	Auto ON	150	80	10	10	0	0	0
2	323	323	ON	1650	Auto ON	150	80	10	10	0	0	30
3	318	318	ON	1650	Auto ON	150	80	10	10	0	0	30
4	316	316	ON	1650	Auto ON	150	80	10	10	0	0	30
5	324	324	ON	1650	Auto ON	150	80	10	10	0	0	30
6	321	321	ON	600	Auto ON	150	0	0	100	0	0	60
7	337	337	ON	300	Auto ON	150	0	0	100	0	0	60
8	130	044	ON	1850	Auto ON	150	70	20	10	0	0	30
9	131	NAME 9	ON	1850	Auto ON	150	70	20	10	0	0	30
10	132	NAME 10	ON	1850	Auto ON	35	0	0	100	0	0	30
MASTER ON			USER ACCOUNTS			GLOBAL SETTINGS			ESC 			HOME 

The above screen shows the blending ratios per truck.

THANK YOU!

Mark DeVries
Retired - McHenry County IL
DOT