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Earth Matters: Worth His Salt

by [Susan Hellauer](#) February 11, 2017



by Susan Hellauer

It's ten hours and counting down to a winter storm with foot-of-snow potential. You'd think that the Orangetown Highway Department headquarters off Route 303 would have people running around and yelling into phones. Not so. The mood was business-as-usual, and the silver-haired Superintendent of Highways stood aside and watched his staff work.

His department is responsible for roads in the town's unincorporated hamlets of Pearl River, Blauvelt, Orangeburg, Tappan, Sparkill, Palisades and Upper Grand View. In his 20 years at the helm, Jim Dean has made efficient and eco-friendly ice and snow removal a pet goal. His department has the awards to show for it—23 years' worth from various industry associations, the latest just this week—and they've consistently been ahead in the region with innovations that save money and reduce environmental damage.

We sat down in a conference room and Dean immediately began talking ice and salt, knocking down my questions before I could set them up. Superior snow removal is not just Dean's job; it's clearly a passion, one that started as a research project at Rockland Community College in the 1970s. His "Sensible Salting" public works term paper earned an A for the Business Administration major, and his summer job at the Orangetown Highway Department turned into a 60-year career, and counting.

Salt brine anti-icing



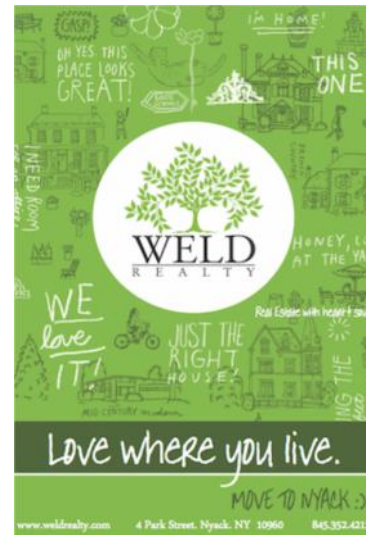
Anti-icing tanker pre-treats Orangetown roads. Photo: Orangetown Highway Dept.

Through Dean's tenure, he and his agency were active in the [American Public Works Association](#), which covers both the U.S. and Canada. In the late 1980s, he noticed that APW members in the midwestern snow belt were beginning to use salt brine, instead of rock salt, to pre-treat roads and highways in advance of storms. It was cheap (only 4 cents per gallon then; now 10 cents per gallon, including labor), it stuck where it was sprayed (unlike scattering rock salt), and it was diluted enough to save vegetation and waterways from a full-on salt attack every winter.

Jim Dean pondered salt brine anti-icing for Orangetown's 200 miles of road, but the specter of litigation was on his mind. Lawyers can point to a new de-icing technique as the cause of an **accident**, making it hard for municipalities to move away from established routines. After much thought and careful study, Dean asked the Town Board in 2003 to approve purchase of brine-manufacturing



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UPCOMING LOCAL EVENTS

equipment—the first in the NY metro area, coming on line in 2004. “It wasn’t a hard sell, with a three-year payback period,” he said. And the town wasn’t unhappy when the payback ended up being less than two years.

Before a winter storm, Orangetown roadways are pre-treated with a 23% salt-and-water mixture. Once snow begins to accumulate, the brine is also used to wet down rock salt as it’s ejected from spreaders on the plow trucks (plus a mixture of natural liquid chlorides called Envirobrine for very low temperatures). This activates the salt’s melting power and helps it adhere to the snow pack. Less salt is used, and less is lost to the roadside.

“Anti-icing allows us to be proactive and make the roads safe in that first critical hour,” said Dean. “It buys us a lot of safety.”



Orangetown snow removal fleet. Anti-icing tankers at back. Photo: Orangetown Highway Dept.

Bottom line: less salt. Benefits: many

“It’s gratifying that so much of the NY-NJ metro area is anti-icing now, and we’ve gone in and helped get some of them started,” said Dean. “We didn’t invent it, but we were by far the first here.”

Even the **NY State Thruway** is on board now. Cost-saving is a big reason: homemade brine is cheaper than commercially available solutions. And litigation is less of a worry now that pre-treating is the norm.

Labor costs can be held down with brine pre-treatment, which, according to the Superintendent, can sometimes save a plow run. Avoiding even a couple of hours of overtime for 50 employees can make a significant difference in the Highway Department budget.

It would take an in-depth study to figure the exact infrastructure savings of the brining program, but there are positive signs. Snowplow blades have been switched from road-destroying steel to road-preserving rubber. Much less salt on roads appears to have reduced costs for addressing the winter frost-heave: the 6 or 7-year life cycle of the department’s asphalt chip-seal program has been extended to 10, according to Dean.

More de-icing options

Some municipalities are looking at non chloride-based de-icers as safer or greener alternatives to road salt (sodium chloride) or other chloride compounds. **Portland, Oregon**, which rarely sees ice and snow storms, uses an acetate-based de-icer, CMA (**calcium–magnesium acetate**). It’s a very pricey option, and under certain conditions can make roadways slippery. But it’s easier on cars, infrastructure and drinking water supplies.

De-icers derived from **agricultural by-products**, like the beet pulp used by the NY State Thruway, have become more popular. But many of these are high in phosphorus, which encourages toxic algae blooms in water bodies.

The other chlorides—potassium, magnesium and calcium—each have their **strengths and weaknesses** for safe de-icing, and none is entirely benign in the environment.

Even innocuous-seeming sand causes problems. It clogs storm drains and waterways, causes flooding, and carries damaging phosphorus into streams.

The Road De-icer/Lead Poisoning Connection

Flint, Michigan switched its raw drinking water supply from Lake Huron to the Flint River in 2014. The high chloride level in the new source made the water much more corrosive than the previous supply. Because officials neglected to add a necessary treatment chemical, the water corroded plumbing pipes, leaching lead into tap water, and doubling the number of children with dangerously elevated lead levels in their blood.

Scientists are looking at **excessive road salt and other de-icers** as the chloride culprit in Flint.

Showing events after 1/15.
[Look for earlier events](#)

Sunday, January 15	
12:00pm	HSRC: 41st Annual Holiday E
1:30pm	Sunday Concert
5:00pm	HSRC: Holiday Candlelight Tr
6:30pm	Holiday Candlelight Tour of th
Monday, January 16	
Martin Luther King Jr. Day	
MLK, Jr Birthday	
Village Hall CLOSED	
Tuesday, January 17	
5:00pm	Justice Court
7:00pm	Book and Pub Club
7:00pm	Knitting Squared
Wednesday, January 18	
7:00pm	Nyack Art Collective
7:00pm	Architectural Review Board
Thursday, January 19	
9:30am	Justice Court
7:00pm	Hist. Soc. Nyacks Regular Me
Friday, January 20	
8:00pm	Dr. Jekyll and Mr. Hyde
Saturday, January 21	
10:00am	Headlines Meditation

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Ice, salt and water



Orangetown Highway Dept.
Superintendent Jim Dean. Photo:
Orangetown Highway Dept.

The health of Rockland County’s water was a prime motive when Superintendent Dean first proposed his salt brine program, and it’s only gotten more important.

Recurring droughts brought on by climate change make protection of surface and aquifer drinking water sources more than essential. As long as highways are going to be de-iced, using the smallest possible amount of salt appears to be the least harmful economically viable option right now.

Brine pre-treatment and rock salt wetting cut down

significantly on the total amount of salt used.

And maybe it won’t be too many decades before roads can de-ice themselves, with **conductive materials, solar energy** or **geothermal heat**.

If a better method comes along that works for Orangetown’s residents and the county’s water supply, Jim Dean, wearing one of his environmental hats, will no doubt seek it out. He is also the Chairman of the **Rockland County Soil and Water Conservation District** and Orangetown’s representative to the Stormwater Consortium of Rockland County and the Rockland County Water Quality Committee.

Learn more:

“Ask Smithsonian: What Happens to All the Salt We Dump on the Roads?” (1/6/2014)

Pros and cons of de-icers

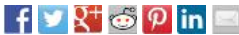
Orangetown Highway Department

NYS Thruway’s Trick to Beet the Sleet (12/28/2012)



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The Villages of Nyack and South Nyack each de-ice with a mixture of calcium chloride and rock salt, and don’t pre-treat their roads.



Nyack DPW plow spreads a rock salt-calcium chloride blend on snowy roads. Photo: Susan Hellauer

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