

CHLORIDE AND SODIUM IN DRINKING WATER

MITIGATION OPTIONS AND BEST MANAGEMENT PRACTICES TO PROTECT PUBLIC DRINKING WATER WELLS

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CEHA FALL CHLORIDE WORKSHOP

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Overview

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- The Drinking Water Section
- What contributes to Sodium and Chloride in drinking water?
- Existing Regulations and Plan Development/Proactive Approaches
- Threats to Drinking Water Quality/Reactive Approaches
- Collaboration



CT DPH Drinking Water Section Responsibilities

- Regulate 2,550 Public Water Systems
- 2.8 million CT Residents Served
 - 3.5 million Total Population
- 550 Community Systems
- 2,000 Non-Community Systems
- 150 Reservoir Systems
- Over 4,000 Groundwater Sources
- Over 350,000 private wells

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CT DPH Drinking Water Section

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Primacy of Safe Drinking Water Act – EPA

- System engineering reviews
- Treatment/source review & approval
- Drinking Water State Revolving Loan Fund
- Drinking water quality
- Oversight of monitoring and reporting
- Ground water rule
- Revised total coliform rule

State Statutory Oversight

- Water supply planning and regional planning (WUCC)
- Purity and adequacy of public drinking water
- Water company land regulation
- Recreation permitting, sale of excess water, certified operators, enforcement



Classic Contributors

- Septic System Failure
- Inappropriate discharge of drinking water treatment wastewater
- Historical/current agricultural uses
- Storm water infiltration/drainage discharges
- Winter roadway/parking lot/sidewalk maintenance practices
- Quarrying and blasting
- Salt Water Intrusion
- Many times it is a combination of two or more of the above

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Proactive Approach: Compliance with Existing Statutes

- For New Public Wells **CGS 25-33(b)**

A plan for any proposed new source of water supply submitted to the department pursuant to this subsection shall include documentation that provides for ... (2) **the water company's ownership or control of the proposed new source of water supply's sanitary radius and minimum setback requirements as specified in the regulations of Connecticut state agencies** and that such ownership or control shall continue to be maintained as specified in such regulations. If the department determines, based upon documentation provided, that the water company does not own or control the proposed new source of water supply's sanitary radius or minimum setback requirements as specified in the regulations of Connecticut state agencies, **the department shall require the water company proposing a new source of water supply to supply additional documentation to the department that adequately demonstrates the alternative methods that will be utilized to assure the proposed new source of water supply's long-term purity and adequacy.**

Proactive Approach: Existing Statutes

For Certificates of Public Convenience and Necessity for Public (CPCN) Drinking Water Supplies:

- **CGS 16-262m(c)(8)** for Community CPCN and **(e)(8)** for Non Community CPCN

“any existing or potential threat of pollution that said department [DPH] deems to be adverse to public health will not affect any new source of water supply.”

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Proactive: Existing Regulations

- **RCSA Section 19-13-B51d:**

Each such well shall be located at a relatively high point on the premises consistent with the general layout and surroundings; be protected against surface wash; be as far removed from any known or probable source of pollution as the general layout of the premises and the surroundings will permit; and, so far as possible, be in a direction away from ground water flow from any existing or probable source of pollution.

Proactive: Linkage to CGS 25-33(b)

RCSA Section 19-13-B51d Minimum Separating Distances

Pollution Source	Separating Distance in Feet		
	<10 gpm	10-50 gpm	>50 gpm
Subsurface Sewage System	75	150	200
Sanitary Sewer	75/25	150/75	200/100
Storm Drain	25	50	50
Foundation, Floor Drain	25	50	50
Dry Well	50	50	50
Annual High Water Mark (surface water body)	25	50	50

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Threats to Drinking Water Quality

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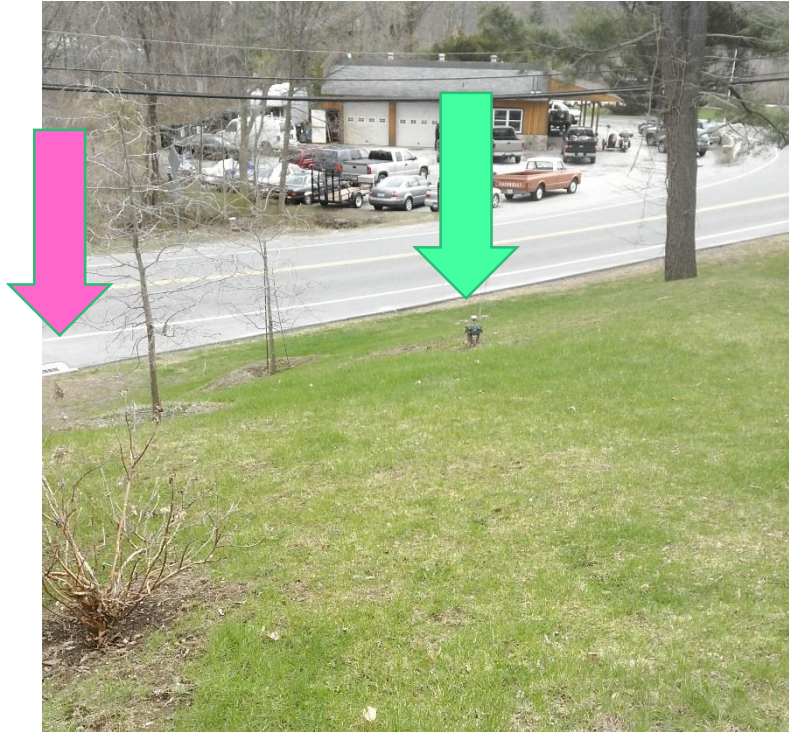
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Threats to Drinking Water Quality

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Sodium concentration: 977 ppm
Chloride concentration: 1995 ppm



Sodium Concentration: 901 ppm
Chloride Concentration: 2097 ppm

Threats to Drinking Water Quality

- Storm water infiltration
- Drinking Water Treatment waste water
- Septic systems
 - Sodium concentration: 175 ppm
 - Chloride concentration: 1103 ppm



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Reactive

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Date	Sodium (mg/l)	Chloride (mg/l)
8/9/2013	20.4	62
7/14/2016	31.1	116
3/14/18	30	152

Mitigation opportunities

- Curbing
- Reduce Deicing Chemical Application

Reactive: Improve land use practices

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Collaboration

- Everyone in the room has a role in reducing the amount of chloride in drinking water
- Encourage protective well placement
 - \$\$ saved initially for shorter pipe runs will quickly be offset by \$\$ spent on required maintenance and replacement of mechanicals due to corrosion
- Evaluate main extensions and interconnections with existing large public water systems when available
- Engineers should consider impacts to drinking water quality when designing storm water management systems
- Educate public water system owners on best management practices
- Elected officials' understanding of the role of land use planning
- Employee/contractor buy-in on maintenance best management practices

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Collaboration

- DPH and Local Health can encourage and provide support to public water systems to protect public drinking water quality
 - Identify threats to drinking water quality
 - Take responsibility to protect the wellhead from threats
 - Work with others to reduce the threats
 - Develop a Source Water Area Protection Plan

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Source Water Protection Practices Bulletin

Managing Highway Deicing to Prevent Contamination of Drinking Water

FACTS:

- More than \$2 billion is spent each year on winter road maintenance.
- 15 million tons of deicing salt are used each year.
- Abrasives such as sand are often used in conjunction with deicing chemicals to provide traction.
- Chloride is not naturally removed from water as it travels through soil and sediments.
- Individual measures might or might not be adequate to prevent contamination by themselves.
- Better forecasting can prevent excessive application

We depend on clear roads and highways for safe travel and the uninterrupted flow of goods and services. Deicing chemicals help clear roads covered by snow and ice during the winter, but road runoff may later carry these chemicals to surface water and ground water sources of drinking water. This bulletin focuses on the management of highway deicing chemicals. See the bulletin on stormwater runoff for additional source water management measures.

This document is intended to serve as a resource for professionals and citizens involved in planning, decision-making, and providing technical assistance in the areas of stormwater management and source water protection. Those who may find this bulletin useful include: state and regional source water, stormwater, nonpoint source control, Underground Injection Control (UIC), and other managers; water system operators; members or repre-



1- Big Red Snow Plow, NJ 2003

The UNH Stormwater Center (UNHSC) is dedicated to the protection of water resources through effective stormwater management.



Connecticut Technology Transfer Center

Training and Events

Green Snow Pro: Sustainable Winter Operations

A CT Road Scholar Program ELECTIVE Workshop

Sustainability in Winter Operations is more important than ever. With environmental impacts increasing and budgets continuing to decline, towns must employ best practices to minimize salt use and maximize their operations for both fiscal and environmental stewardship. This class focuses on those best practices for salt application and maintenance of public works facilities and



Dates & Locations

MUNICIPAL MANUAL

Connecticut's Aquifer Protection Area Program

Conservation, protection, and assessment of the natural resources and environment of the state.



Questions?

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