

Salt pollution in Valley Creek – the data and the response by Valley Forge Trout Unlimited

Pete Goodman, VFTU



SALT IS KILLING VALLEY CREEK !



- ☒ Salt (sodium chloride, NaCl) used in winter de-icing is dramatically increasing the salinity of Valley Creek and many other streams in Chester County.
- ☒ Ecosystems as we know them have already begun to change with the loss of aquatic insects and plants, which are being replaced by more salt-tolerant species.
- ☒ Salt increases corrosion of our concrete and steel infrastructure, which itself costs us more for maintenance.
- ☒ This isn't just a Valley Creek problem. This is an urbanization, ice belt, and world problem.

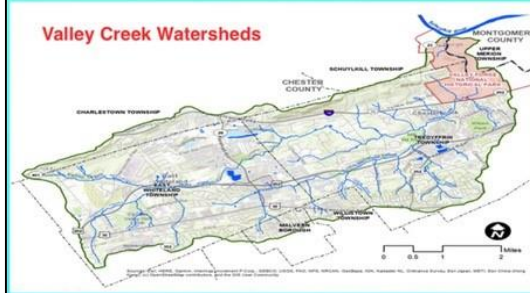
What Can We Do?

Studies of watersheds similar to Valley Creek have found that parking lots can contribute up to 50% of the salt that enters nearby streams. Roads and salt storage piles have been identified as other major sources.

Can We Manage the Problem? YES - if we follow Best Management Practices for winter weather management.

Can We Mitigate the Problem? YES - but only if we adjust our cultural expectations for clear, ice-free streets, parking lots and sidewalks.

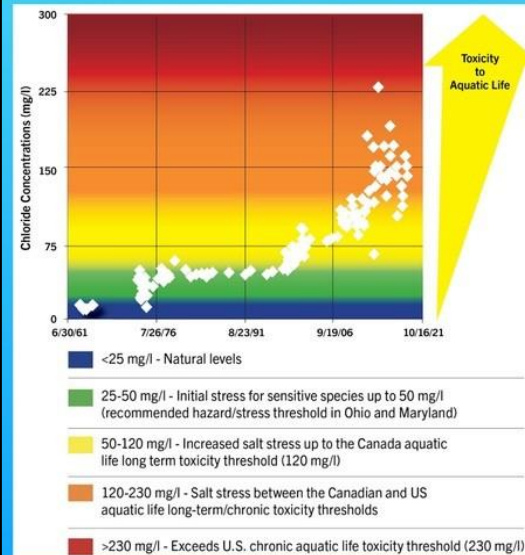
We Need To Use Less Salt !



Our Valley Creek Watershed is home to a "Class A" Wild Brown Trout Fishery. This is a virtual miracle in an urban setting! It is designated by Pennsylvania's Department of Environmental Protection as "Exceptional Value" subject to anti-degradation protections ... yet ...

2021 Valley Creek salt (chloride) data shows 140mg/l - the highest among Chester County Streams!

Salt in Valley Creek Near PA Turnpike (USGS):



What can we do? Once salt has entered the environment, there is no effective way to remove it. The best solution is a widespread, decreased use of road salt. New development inherently results in increased salt pollution.

What Must We Do?

Here Are Proven Measures That Have Been Adopted In Some Salt Belt States:

For Everyone:

- Adapt the de-icing response to the weather forecast.
- Manually remove snow and ice as frequently as possible – use plows ("live edge" if possible) and shovels and shift away from the "chemical" (i.e., salt) solution. Be efficient with salt usage. Know how much salt is needed. *More is not better.* Clean up and reuse excess.
- Leave unused and rarely used areas of parking lots unplowed and unsalted – let the snow and ice melt on its own.

State & Municipal Actions:

- Brine. Consider making brine an integral component of pre-storm AND during-storm treatment.
- Apply pre-wetted salt at approved rates for the conditions.
- Consider application efficiency - evaluate equipment calibration and function to potentially reduce waste and over application.
- Consider developing training programs or updating existing ones – plan for the long term.
- Get the word out to contractors, businesses, and homeowners. Salt pollution is getting worse. Drinking water and stream health are in danger.

Private Contractors

- Brine if equipment is available. Upgrade equipment if possible.
- Apply pre-wetted salt at approved rates for the conditions.
- Store salt properly under permanent shelters.
- Reach out to clients and local government to creatively reduce salt application while keeping people safe.

Homeowners

- Use the right amount; one 12 oz. cup of salt per 20 feet of driveway or 10 sidewalk squares.
- Consider mixing sand or crushed limestone 1:1 with the salt or even just using the abrasive.
- Don't use products containing urea, Kitty Litter or ashes.
- Clean up and reuse excess salt.
- Be the eyes of Valley Creek – report an unprotected salt pile or excessive salt use to your township.

Salt Jeopardizes The Ecological Health of Valley Creek!

This Affects Both Our Health And Cost of Living!

Road Salt's Environmental Impacts:

- **Drinking water** becomes contaminated.
- **Health and wellbeing** are negatively affected by the loss of ecosystem functions and services.
- **Aquatic Life** – small freshwater invertebrates are most sensitive; small changes in the food web have cascading effects. Once ground water is contaminated, salt is impossible to remove.
- **Vegetation and Soil** – changes the characteristics of soil and water, which impacts plant health above and below ground.
- **Infrastructure** – vehicles and bridges corrode; sodium chloride (rock salt) leaches out lead in pipes. Salt can mobilize toxic heavy metals into drinking water.

STOP VALLEY CREEK FROM BEING "A-SALT-ED"



For additional details and information go to:

<http://www.valleyforgetu.org/>

Or contact:

peteg5020@gmail.com



Stroud Water Research Center provided science and data support for this information.

<https://stroudcenter.org>

A Screen Shot of the VFTU Salt Pollution webpage

Helpful links:

Valley Forge Trout Unlimited's (VFTU) Website:

www.ValleyForgeTU.org

VFTU's Salt Pollution Page:

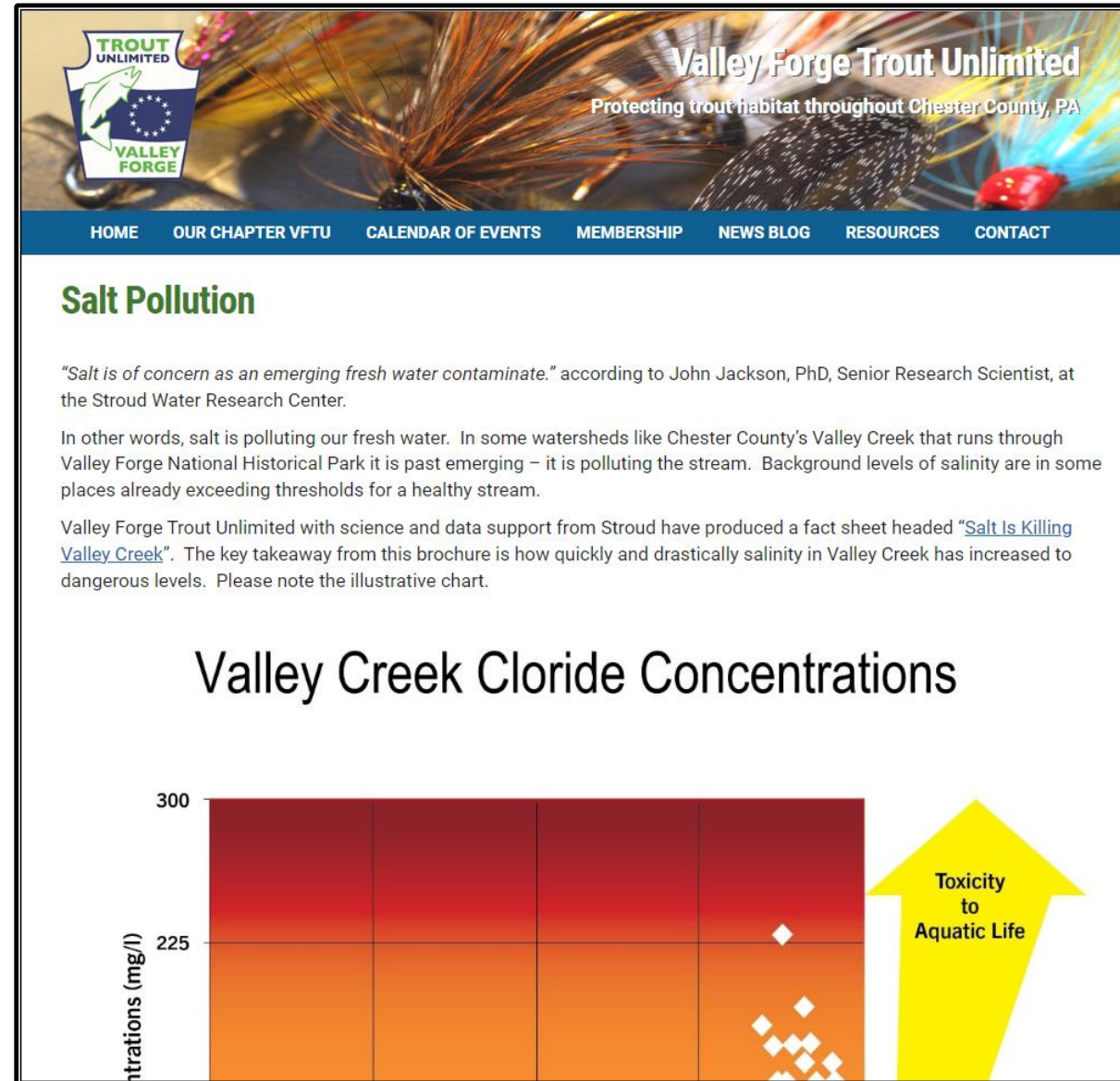
<http://www.valleyforgetu.org/resources/whitepapers/road-salt/>

VFTU's Salt Pollution Fact Sheet – Printable Version

http://www.valleyforgetu.org/wp-content/uploads/4-pgs-Final-Layout-VFTU-Bifold-Salinity-Brochure-12_02_22.pdf

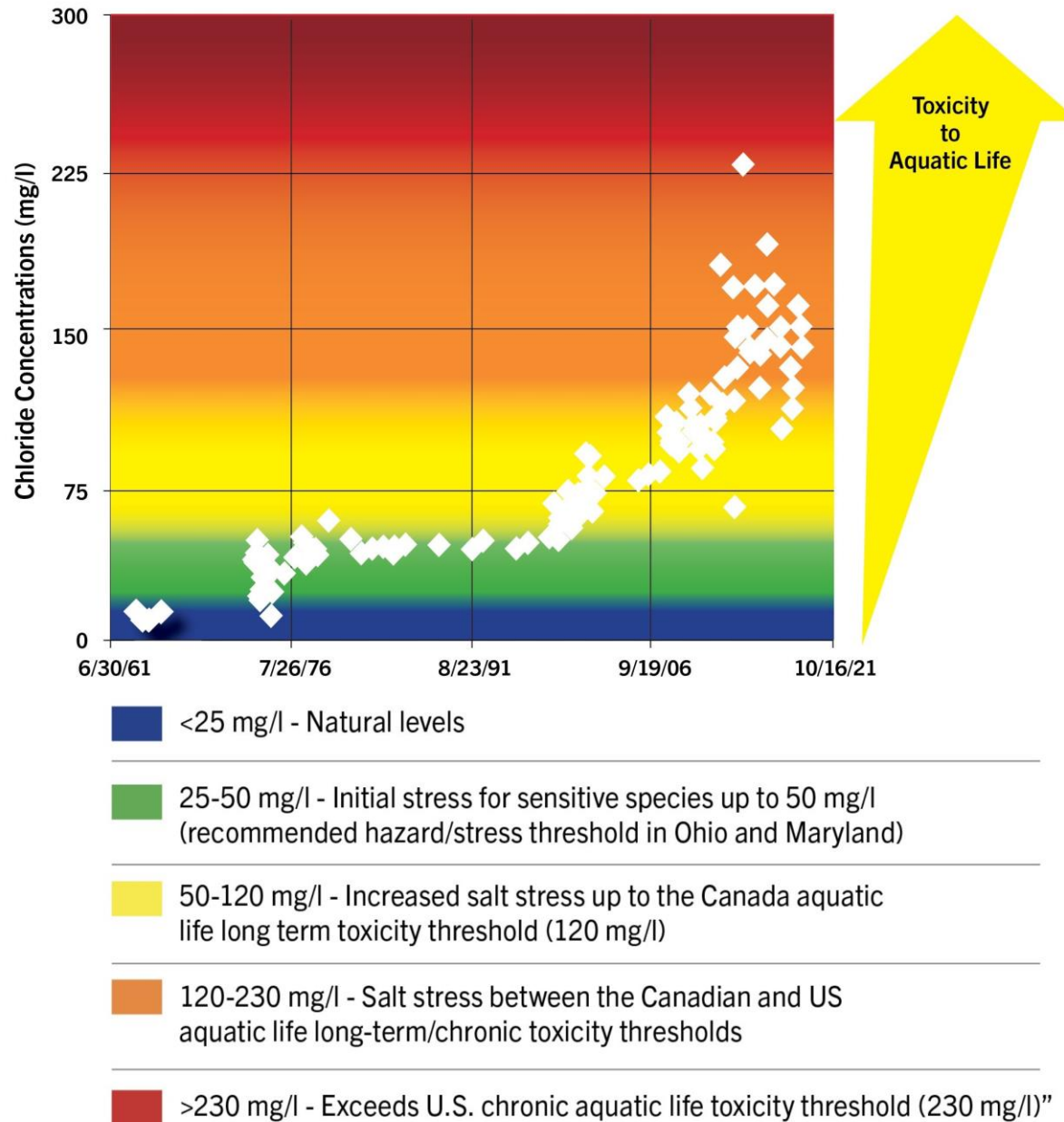
VFTU's Salt Pollution Fact Sheet – 4 Panel Version

http://www.valleyforgetu.org/wp-content/uploads/VFTU-Salinity-Brochure-12_07_2022-4-panel-layout.pdf



61 Years of Data tells the story

Data from Valley Creek

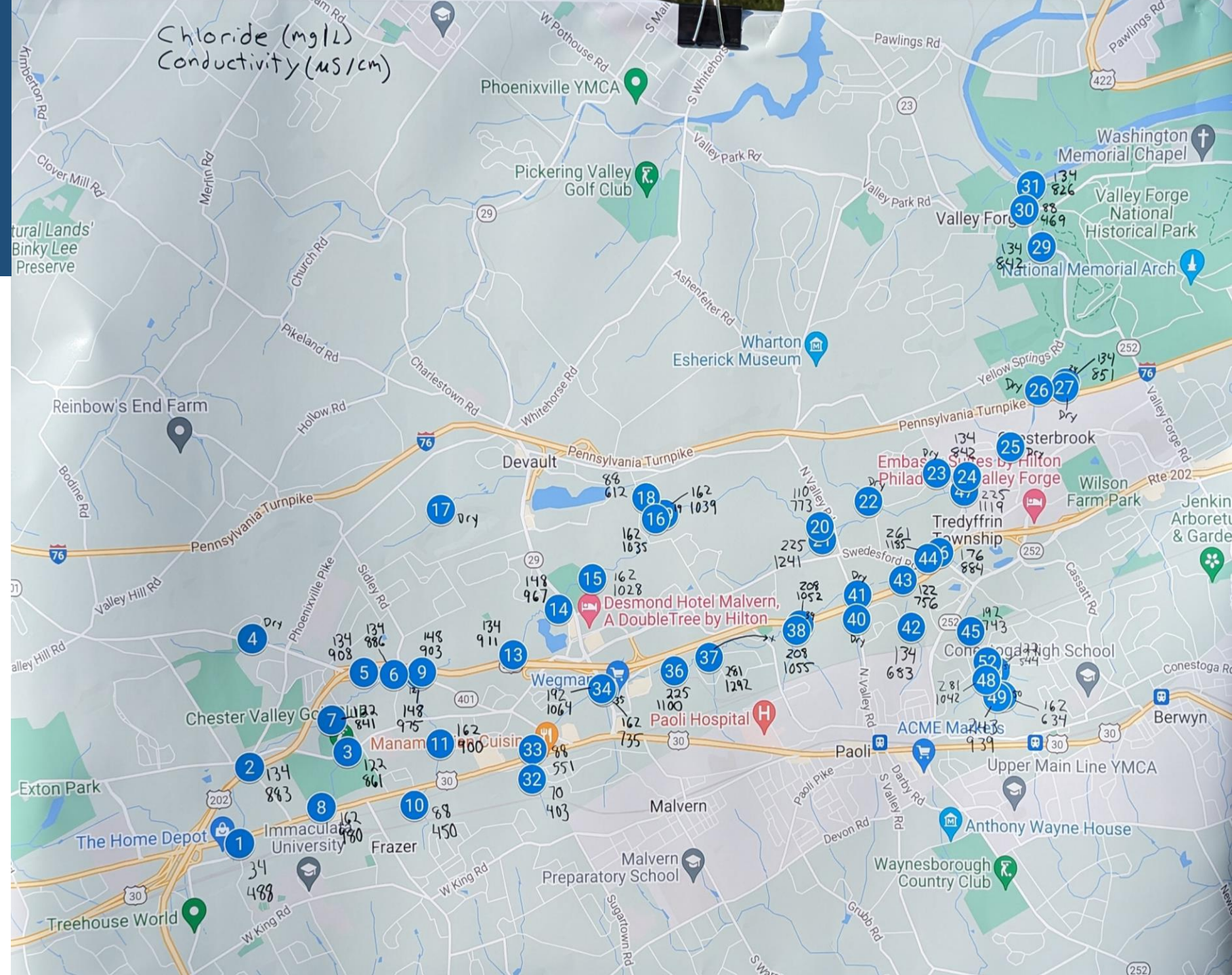


Note - the U.S. EPA specifies that the 4-day chloride average should not exceed the chronic aquatic life toxicity threshold (230 mg/l) more than once every three years.

Environment Canada specifies that 24-96 hour chloride average should not exceed the long-term toxicity threshold (120 mg/l).

This data is background salt pollution

A Salt Snapshot was performed on the Valley Creek Watershed on November 9, 2022. These are the results.



Crabby Creek this morning as we try to find the source of the very high salinity readings...

730 & 740 at the top of the western Trib.

More questions than answers.



We would like your help in collecting local information.

Ask your Township Manager or Director of Public Works for the information.

Return the completed sheet or whatever information you are able to collect to me Pete Goodman at peteg5020@gmail.com

We need information to be able to make informed choices that will direct the focus of our efforts.

This form is available on the VFTU website at the bottom of the Salt Pollution page or at this link:
<http://www.valleyforgetu.org/wp-content/uploads/VFTU.Salt-Use-Information-Report.230101.xlsx>

THANK YOU

SALT USE INFORMATION REPORT

Form: VFTU .SUIR.230101.v2

Season	Product (Select from choices below)	Tons Used, Applied or Purchased	Gallons of Brine Applied	Source of Brine	Lane Miles of Road Treated	Acres of Parking Lots Treated
1999-2000						
2000-2001						
2001-2002						
2002-2003						
2003-2004						
2004-2005						
2005-2006						
2006-2007						
2007-2008						
2008-2009						
2009-2010						
2010-2011						
2011-2012						
2012-2013						
2013-2014						
2014-2015						
2015-2016						
2016-2017						
2017-2018						
2018-2019						
2019-2020						
2020-2021						
2021-2022						
2022-2023						
	Product Choices:	Natural Rock Salt Treated/Coated Rock Salt Beet Heat Brine-wetted Rock Salt Brine Other - Please Explain				
	Goal of Information Collection: To get a salt (Volume or Weight) per lane mile estimate.					
	PA DOT: From 2022 Information					
	807,766 Tons Rock Salt/Year average of the last 5 years					
	12,300,000 Gallons of Brine used last year					
	91,165 Snow lane miles of road treated					

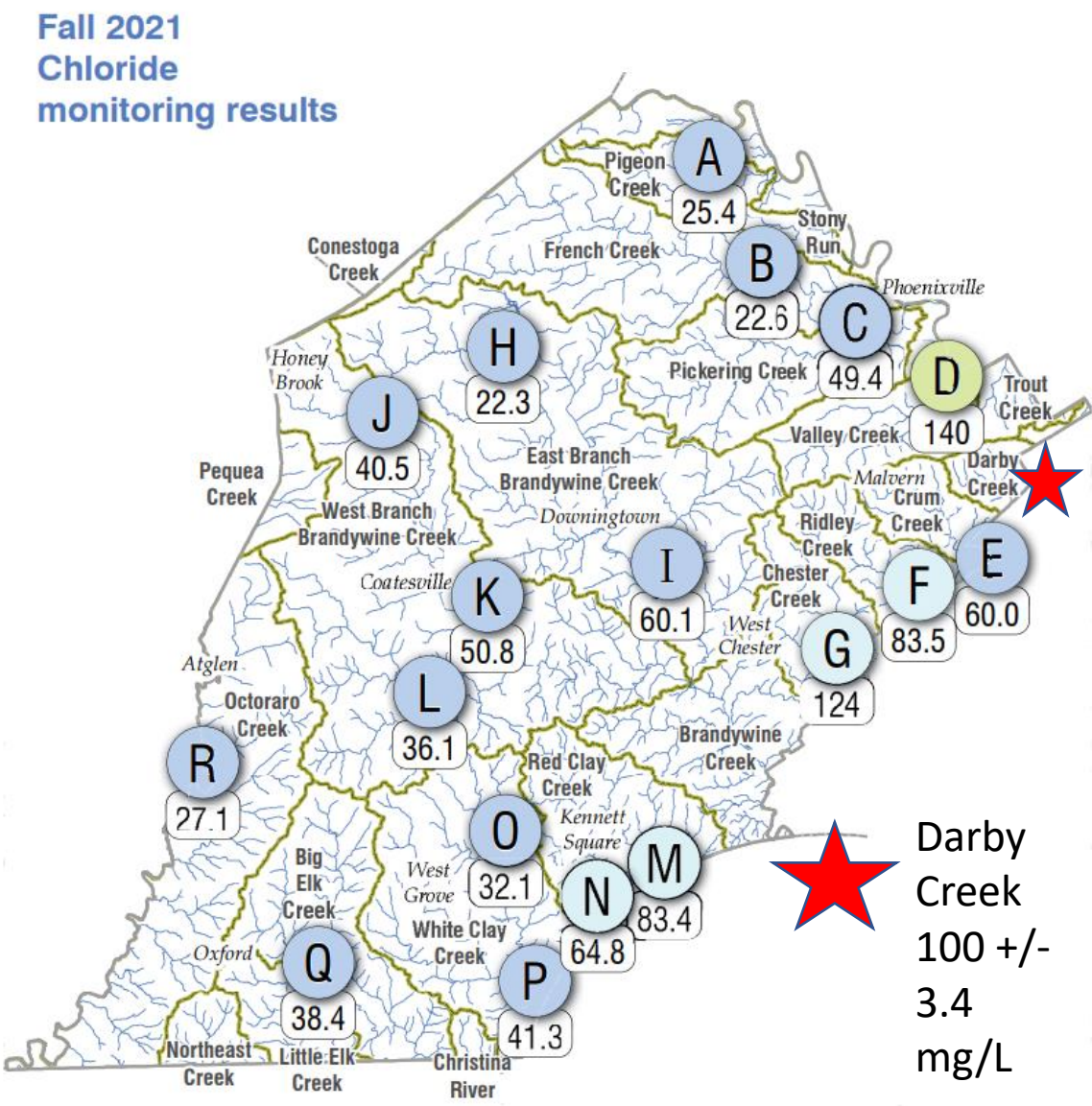
Reported By: _____

Municipality: _____

Date: ____/____/____

KEY FINDINGS

- Mean chloride concentrations across all monitoring sites increased from an average of 52.5 mg/L in 2020 to 55.7 mg/L in 2021.
- While most sites with increases saw fairly modest changes, relatively significant increases were noted at:
 - Pickering Creek: an increase from 31.9 to 49.4 mg/L, and
 - Valley Creek: and increase from 120 mg/L to 140 mg/L
 - Valley Creek had the highest concentration of 140 mg/L, which is over twice the average for the 18 County-wide sites.



Chloride: Relative to 250 mg/L standard

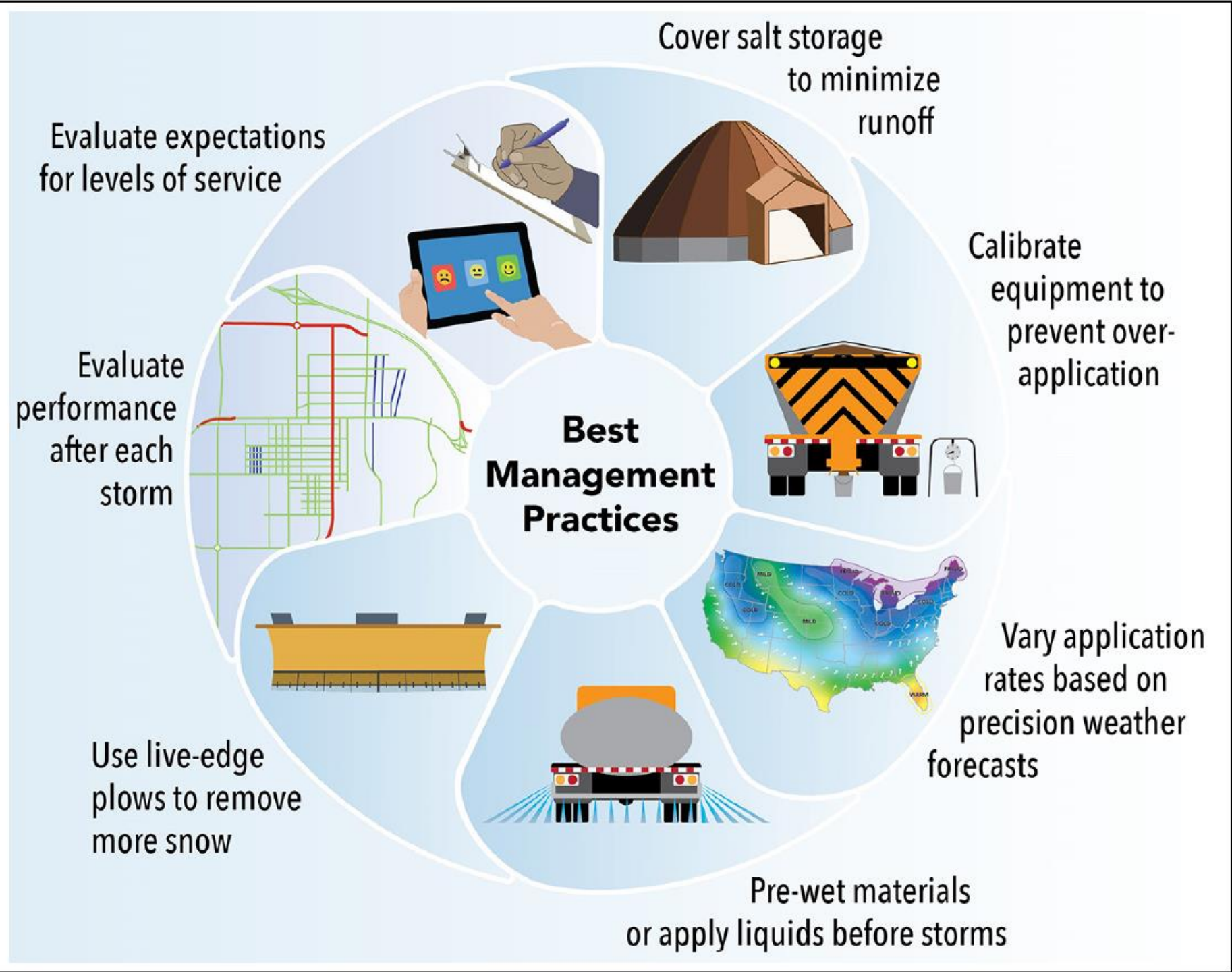
Below 62.5 mg/L (below 25%)	13 sites
From 62.5 to 125 mg/L (25% - 50%)	4 sites
From 125 to 187.5 mg/L (50% - 75%)	1 sites
From 187.5 to 225 mg/L (75% - 90%)	0 sites
Above 225 mg/L (90% and up)	0 sites

Map ID	Location	Chloride, mg/L
A	Pigeon Creek near Slonaker	25.4
B	French Creek near Phoenixville	22.6
C	Pickering Creek near Phoenixville	49.4
D	Valley Creek at PA Turnpike near Valley Forge	140
E	Crum Creek at Newtown Square	60.0
F	Ridley Creek at Rt. 3 near Willistown	83.5
G	East Branch Chester Creek at Westtown	124
H	East Branch Brandywine Creek at Glenmoore	22.3
I	East Branch Brandywine Creek below Downingtown	60.1
J	West Branch Brandywine Creek near Honey Brook	40.5
K	West Branch Brandywine Creek at Modena	50.8
L	Buck Run at Doe Run	36.1
M	East Branch Red Clay Creek near Five Points	83.4
N	West Branch Red Clay Creek near Kennett Square	64.8
O	East Branch White Clay Creek at Avondale	32.1
P	Middle Branch White Clay Creek near Avondale	41.3
Q	Big Elk Creek at Maple Grove	38.4
R	East Branch Octoraro Creek near Steelville	27.1

Information extracted from the 2021 Annual Water Status Report published by CCWRA 12/2022

From: **State of Our Streams Report**
Willistown Conservation Trust – August 2022

Best Management Practices for Road De-Icing Salt



How to reduce deicing salt used

Establish a certification program

- ✓ New Hampshire,
- ✓ Minnesota,
- ✓ Madison Wisconsin



Winter Salt Management Program

Presentations Given to the Following:

- Tredyffrin Township EAC – Nov. 29, 2022
- East Whiteland Township EAC – Jan. 30, 2023
- Northern Chester County EAC Group (12 EAC's + Phoenixville Green Team) – Jan. 30, 2023
- Wrote two articles for Township Newsletters
- Scheduled: Easttown Township EAC – February 23, 2023

Valley Creek Restoration Partnership monthly meeting:

- New Hampshire Salt Reduction Program “Green SnowPro” - Jan. 18, 2023
Presented by Aubrey Voelker, NHDES Salt Reduction Program Coordinator