

# Field Tour of Bristol Water Treatment Plant and MDC's Nepaug Reservoir



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# Participating Agencies

- American Water Works Association, CT Section
- Bristol Water Department
- CT Association of Directors of Health
- CT Conservation Districts
- CT Department of Agriculture
- CT Department of Energy and Environmental Protection
- CT Department of Public Health
- CT Farm Bureau Association
- CT Fund for the Environment
- CT Office of Policy and Management
- CT Water Works Association
- Metropolitan District Commission (MDC)
- Rivers Alliance of CT
- South Central CT Regional Water Authority
- US Environmental Protection Agency

**A special thanks to Superintendent of  
Bristol Water Department, Robert  
Longo, and Natural Resources  
Administrator of MDC, Carol Youell,  
for hosting.**



# Field Tour Overview

## Tour of Bristol Water Treatment Plant

**8:30-9:00** Meet and Greet

**9:00-11:00** Tour of the Plant

## Tour of MDC Watershed

**12:30-3:00** MDC-guided tour of forest management areas within the Nepaug Reservoir public water supply watershed.

# Bristol Water Treatment Plant

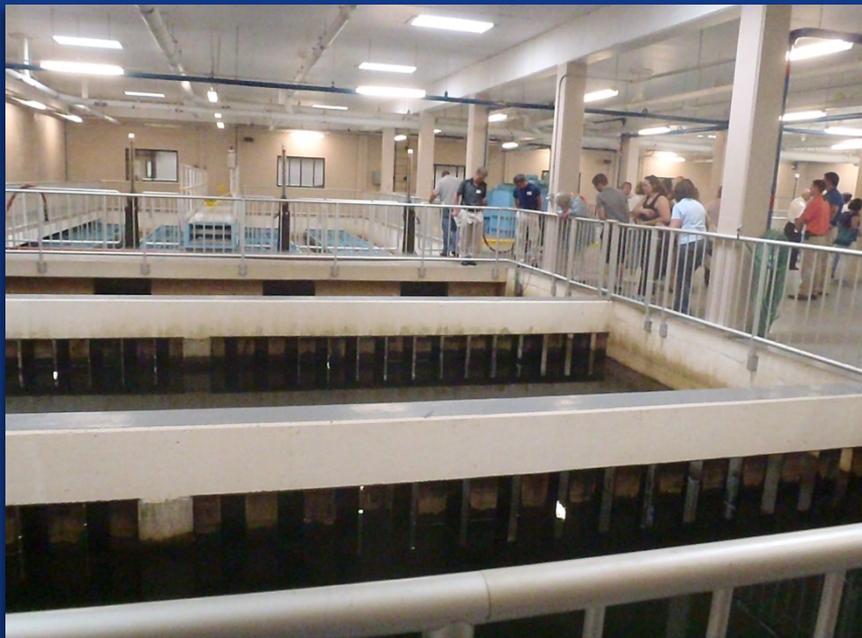


# Rapid Mix Chambers



The plant influent flows to two-stage rapid mix basins

# Flocculation Basins



Water then flows through three-stage flocculation basins where mixers provide gentle agitation necessary for floc formation. The mixers have speeds from slow to slower.

**Flocculation:** *a process to enhance agglomeration or collection of smaller floc particles into larger, more easily settleable particles through gentle stirring by hydraulic or mechanical means*



Close-up of floc accumulation.

# Sedimentation Basins



The sedimentation basins allow floc particles to settle to the bottom. Sludge is directed to the sludge lagoons.

# Representation of Filters



# High Rate Multi-Media Filters



The effluent from the sedimentation basins flows through the multi-media filters to a filter wetwell and on to the treated water reservoirs.

# Underneath the Flocculation Basins



# MDC's Nepaug Reservoir



# Tree Removal Project 2014

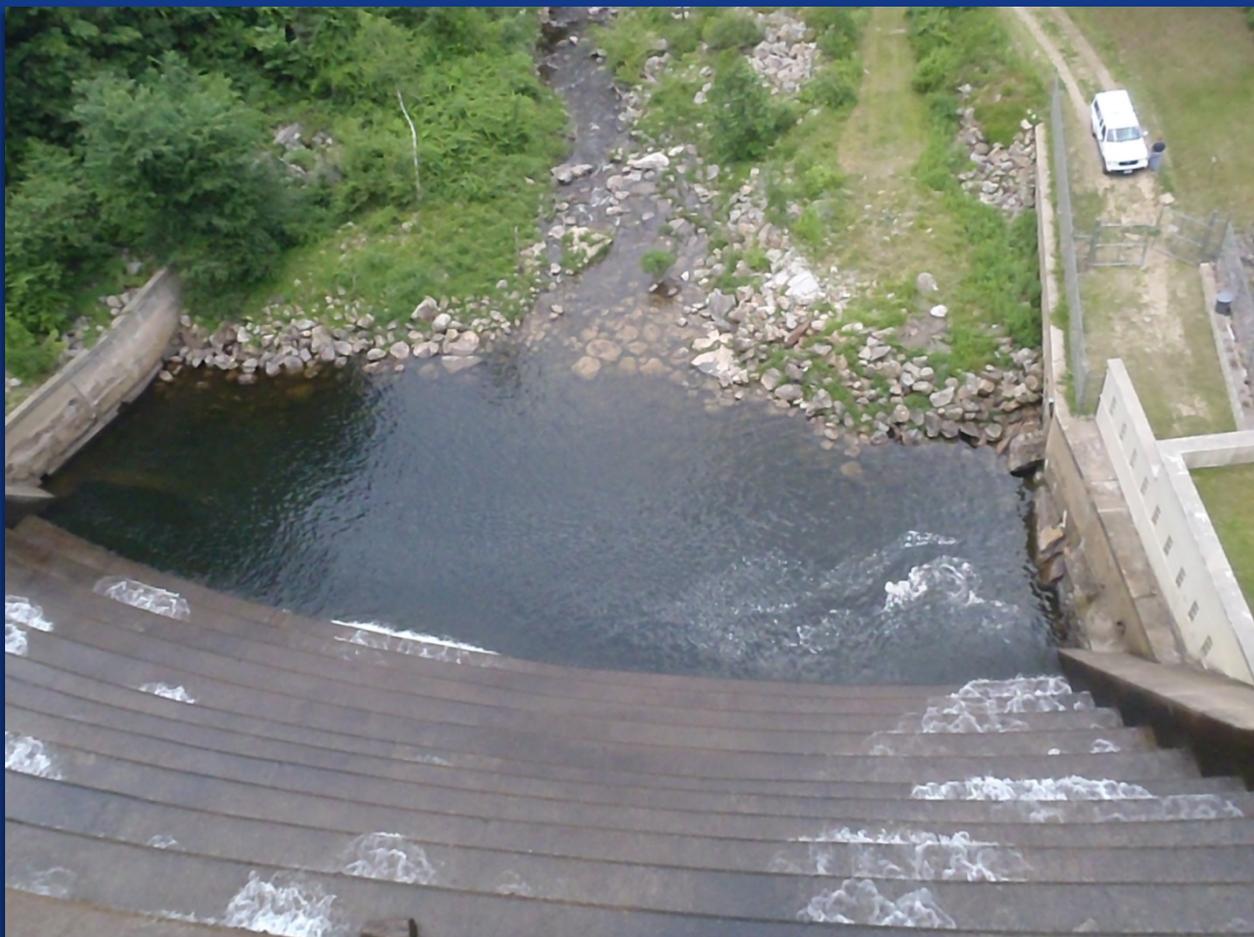


Removal of the Hemlock trees was necessary as a result of the infestation of the insect called the *Hemlock Woolly Adelgid*.



120 Norway Spruce trees and 650 White Pine and Norway Spruce seedlings were planted in areas that had been cleared.

# The Nepaug Dam



Standing about 156 feet tall and 650 feet long, the Nepaug Dam is the only arched concrete gravity dam in CT

# Regrowth from previous hemlock tree removal in 2004



# Deer Management

- The deer population at MDC's Nepaug Reservoir is preventing tree seedlings & other native plants from growing.
- In 2006, a CT DEEP survey showed 95% of the seedlings sampled were heavily browsed by deer.

## Deer Exclosure:

**A small fenced area was built in 2006 to keep deer out and demonstrate their impact on the forest.**



# High Deer Populations...

- Prevent the growth of tree seedlings
- Destroy native plant communities
- Eliminate forest understory which holds the soil
- Increase the risk of soil erosion and runoff, causing water quality degradation
- Reduce biodiversity and affects long-term forest health



# Program Goals



Implement a long-term program to restore the balance between deer populations & sustainable forests that protect water quality

Reduce the  
deer population

Increase water  
quality  
protection

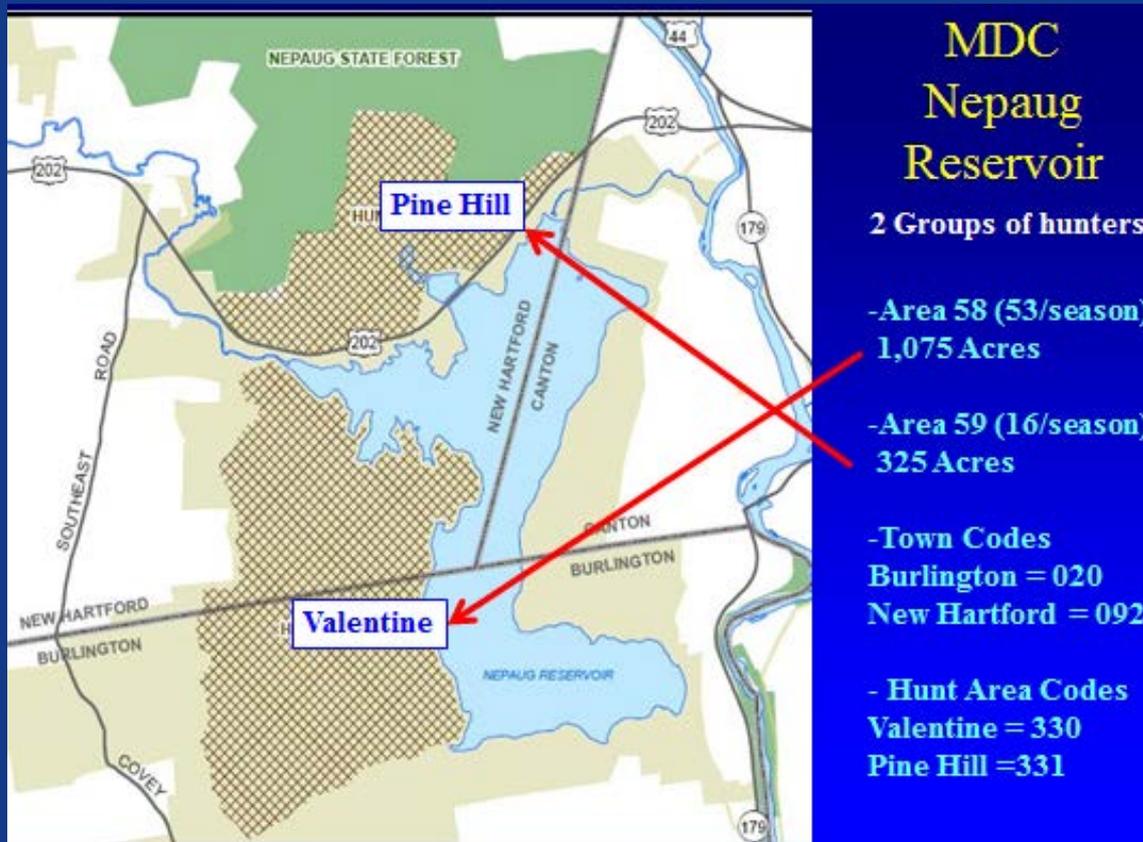
# Deer Management



Tree growth results from fenced deer exclosure

# Deer Management

- Controlled Hunt Lottery – Began in 2009
- Administered by CT DEEP in accordance with CT hunting laws & regulations



# Forest Management



2010 Harvest:  
Remove mature pines, encourage  
white pine regeneration, encourage  
natural age class diversity in the  
forest



2011-2012 Harvest:  
Release advanced white pine and  
sugar maple regeneration, salvage  
dying white ash trees, increase age  
class diversity, retain the healthiest  
trees for the future growing stock



# Watershed Management Concepts

- How we use the land directly affects the quantity and quality of water reaching our reservoirs.
- Our best line of defense is to protect the water at its source through good land management practices.
- Forests are the most desirable land use for protecting supplies:
  - Act as a natural buffer; filter, trap and recycle pollutants
  - Intercept runoff, moderate stream flows, stabilize soils
  - Reduce the amount of water treatment needed
- Healthy watershed forests are achieved through active management which promotes a diversity of tree species, sizes and ages, and a continuous cycle of tree cover over time.