Town of Ticonderoga
Water System Evaluation

Source Water

Gooseneck Pond:

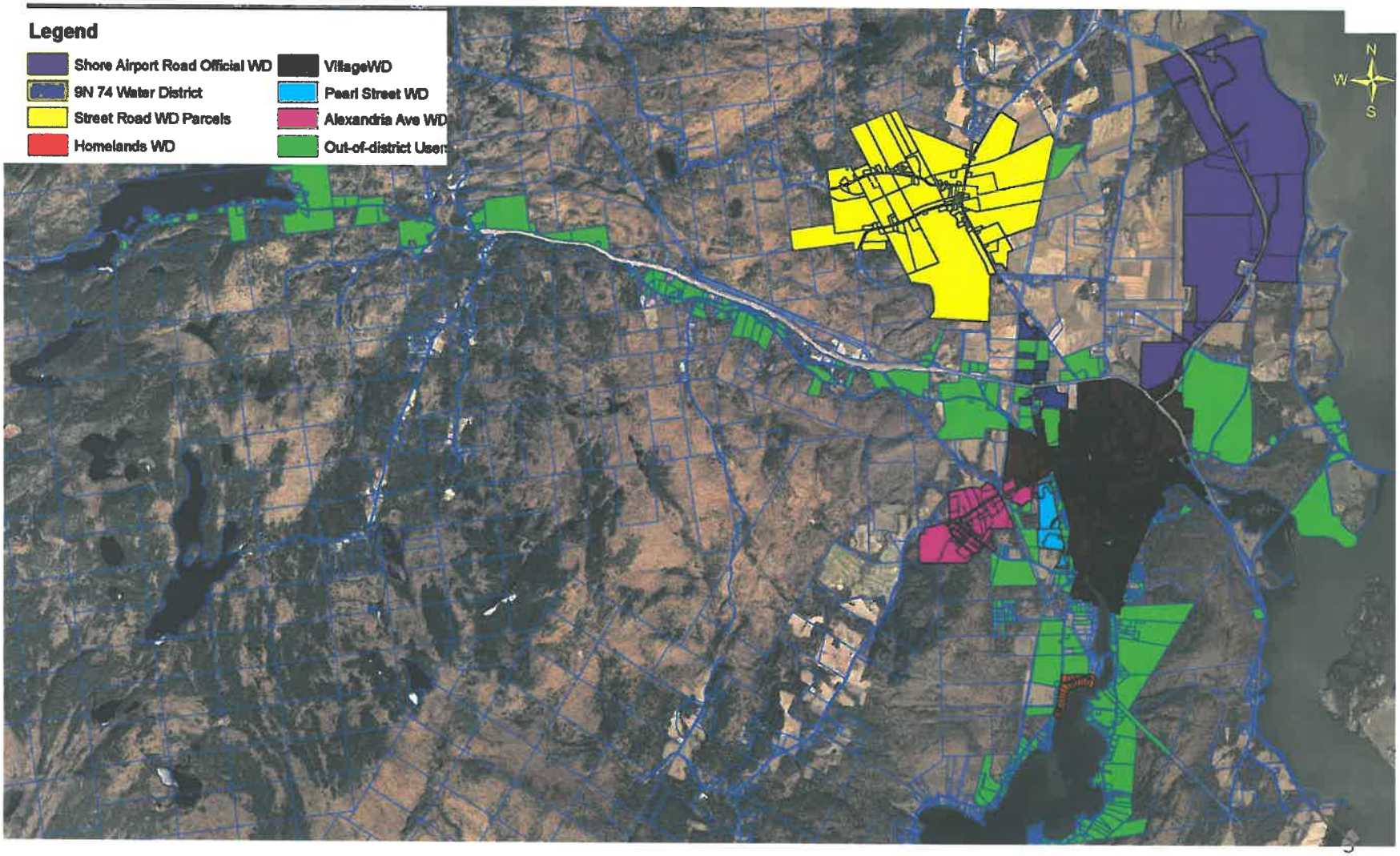
- Operates under filtration avoidance criteria, which can be rescinded at any time.
- Reported 800,000 gal/day capacity
- DOH approved treatment only achieved below Chilson Reservoir.

Lake George:

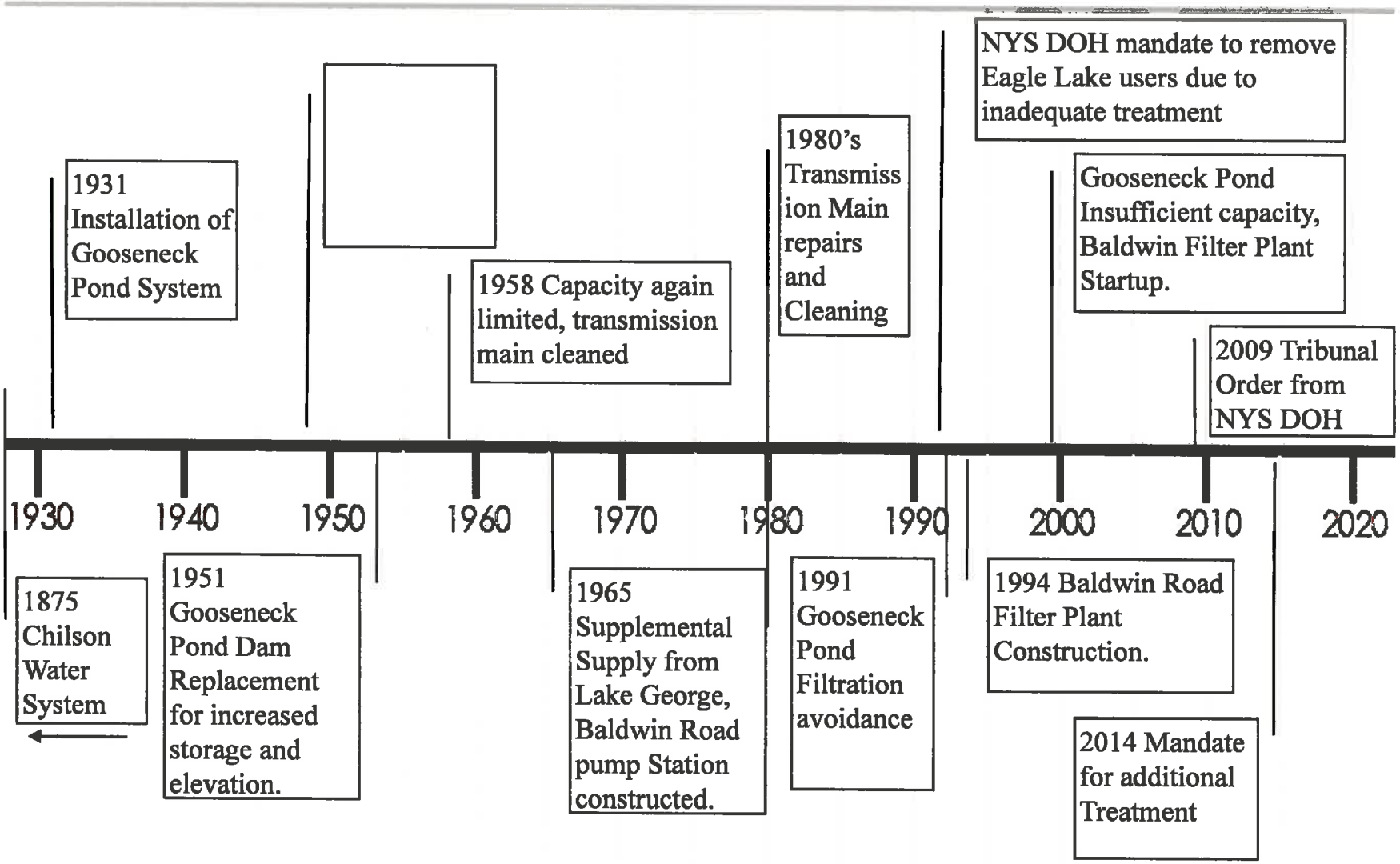
- DE Filter plant
- Permitted withdrawal: 2 million gallons/day.
- Filter Plant Capacity: 1 mgd/day???

Ticonderoga Needs 1.5 Million gallons per day

Current Service Area



History of Capacity, Conditions and Compliance



History of Capacity, Conditions and Compliance

Investigated the installation of a booster pump to push water over the divide, increasing the flow from 790,000 gpd to 1 million gallons per day. ***"...we do not consider that the installation of a pumping station is in the best interest of the Village"***

- April 25, 1958 "Engineer's Report for the Gooseneck Pond Water Supply,"

Letter regarding filtration avoidance specifically cites the users between Eagle Lake and the Chilson Reservoir stating that the Town should ***"form a district which encompasses all such people, not just the ones further down the line who may actually have sufficient contact time for Chlorination purposes."***

– August 27th 1991 Mr. Quentin Kestner to the Village of Ticonderoga

"The transmission main from Gooseneck Pond to the Chlorination Station leaks in several locations. The Chilson reservoir also leaks and must be covered to meet present standards. ....these facilities built in the early 1930's have reached and probably exceeded their useful design life"

"Preliminary Engineer's Report" July 2002, prepared by Kestner Engineers P.C.

The water main from Chilson Reservoir to the commercial district ***"has experienced (4) system breaks in the first (6) months of 2002."***

- "Preliminary Engineer's Report" July 2002, prepared by Kestner Engineers P.C.

The Law: EPA & NYSDOH

EPA Long Term 2 Enhanced Surface Water Treatment Rule (LT2)

- Specific requirements for uncovered reservoirs: (April 1st 2009)
- Provide (3) log removal through additional treatment: *(September 2014)*

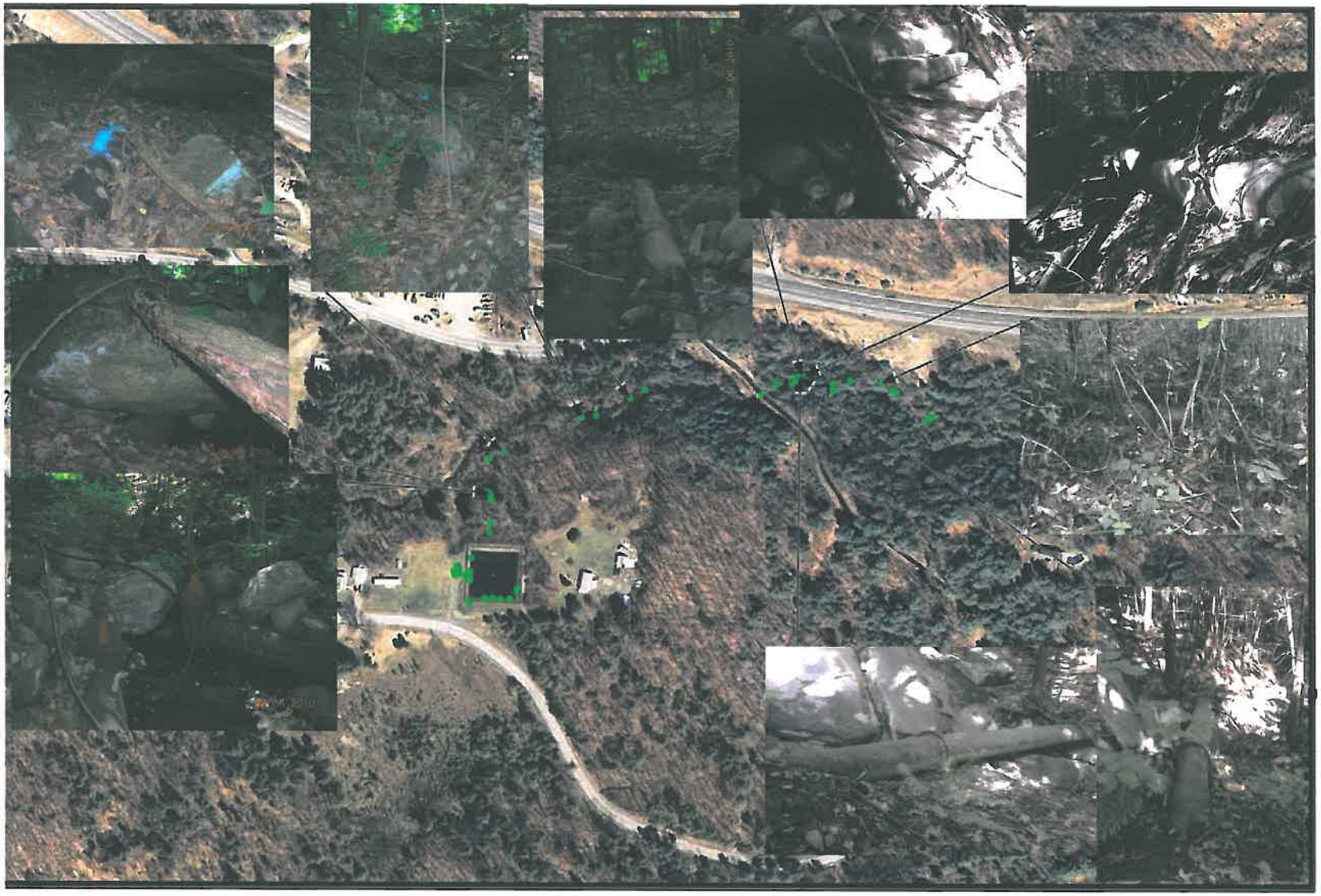
Current NYS DOH Tribunal Order: (Issues cited)

- Replace the Chilson Reservoir with a new water storage tank
- Upgrade or replace the Lake George filtration plant
- Upgrade or replace the Gooseneck Pond water supply

Current NYS DOH Tribunal Order: (Timeline)

- June 14, 2013: Completion of Engineering Report to NYS DOH
- December 13th 2013 Completion of Plans and Specifications
- July 1st 2015 Complete Construction

Gooseneck Pond System - Lower Chilson Water Main



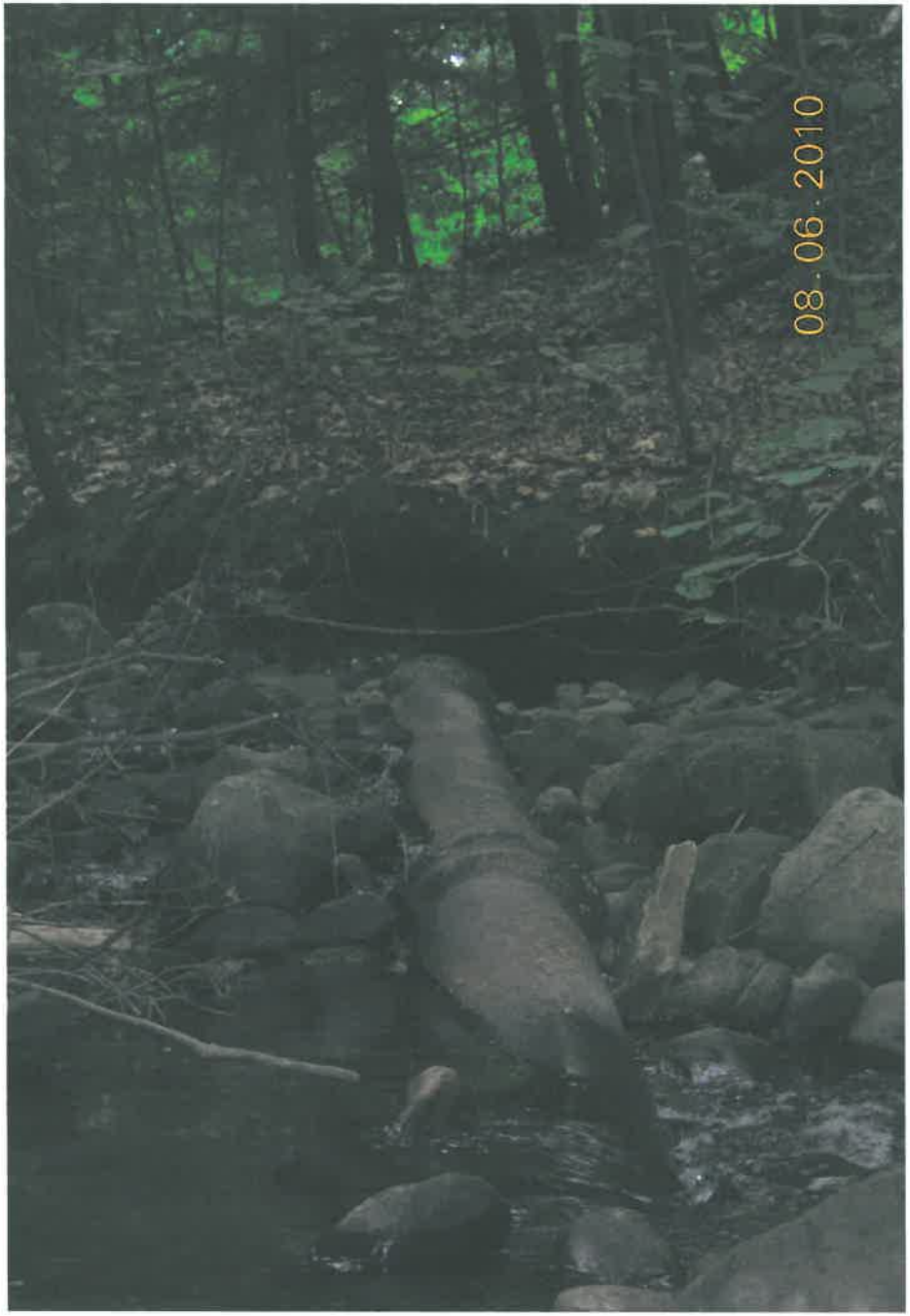
CHILSON WATER MAIN


06 2010


08.06.2010


08.06.2010


08 06 2010

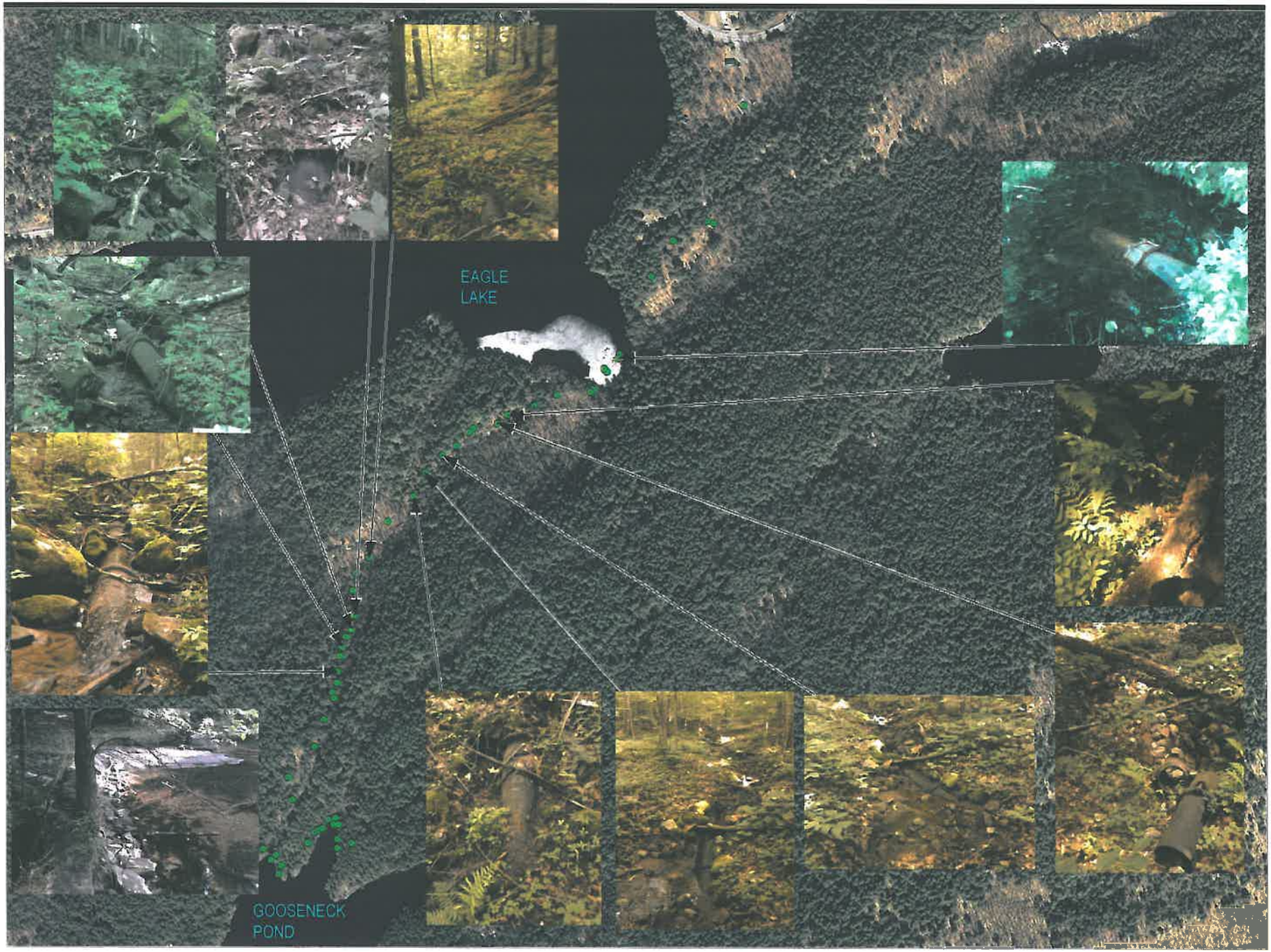

08.06.2010

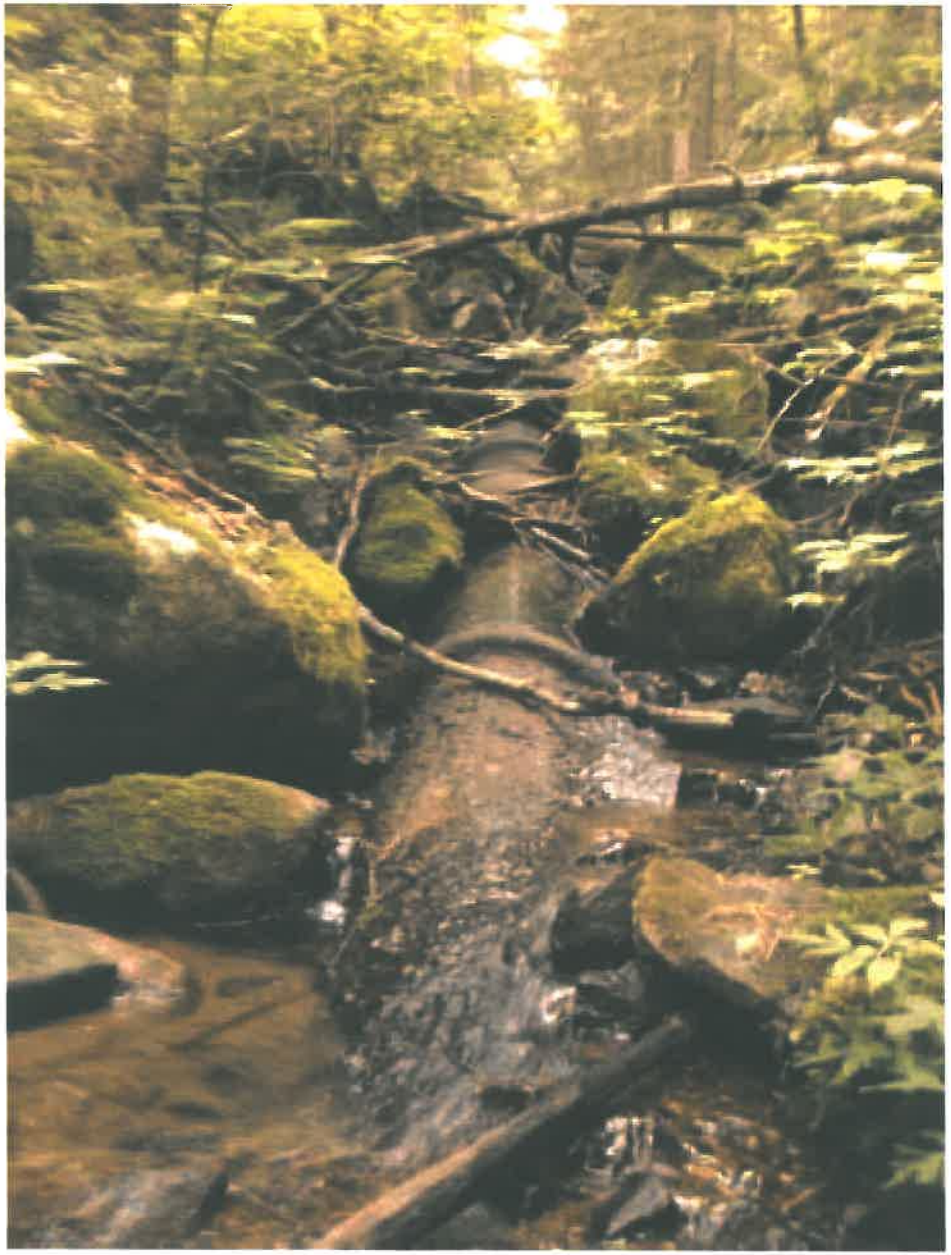
Chilson Reservoir: Conditions Survey

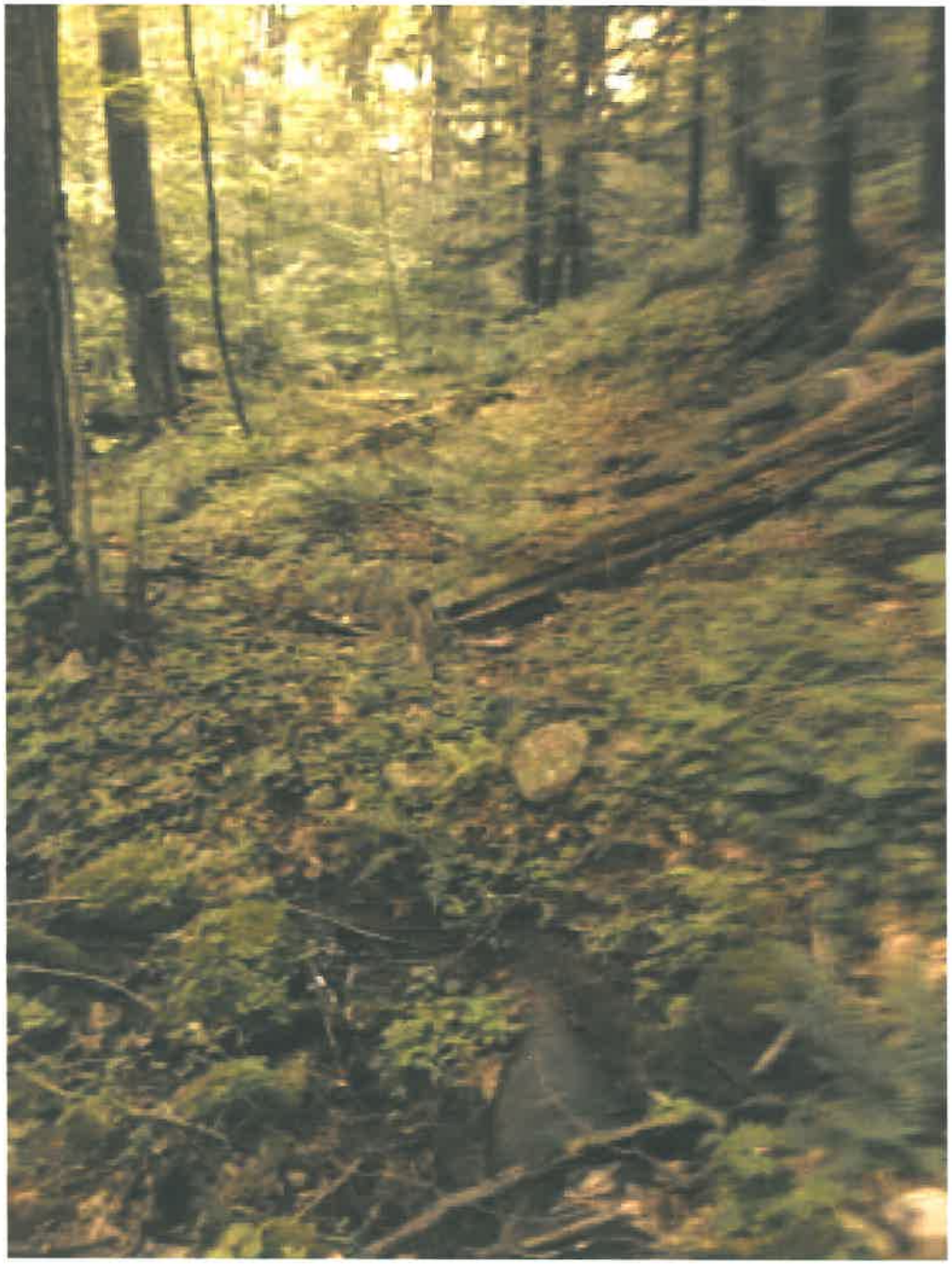
A State of Failure:

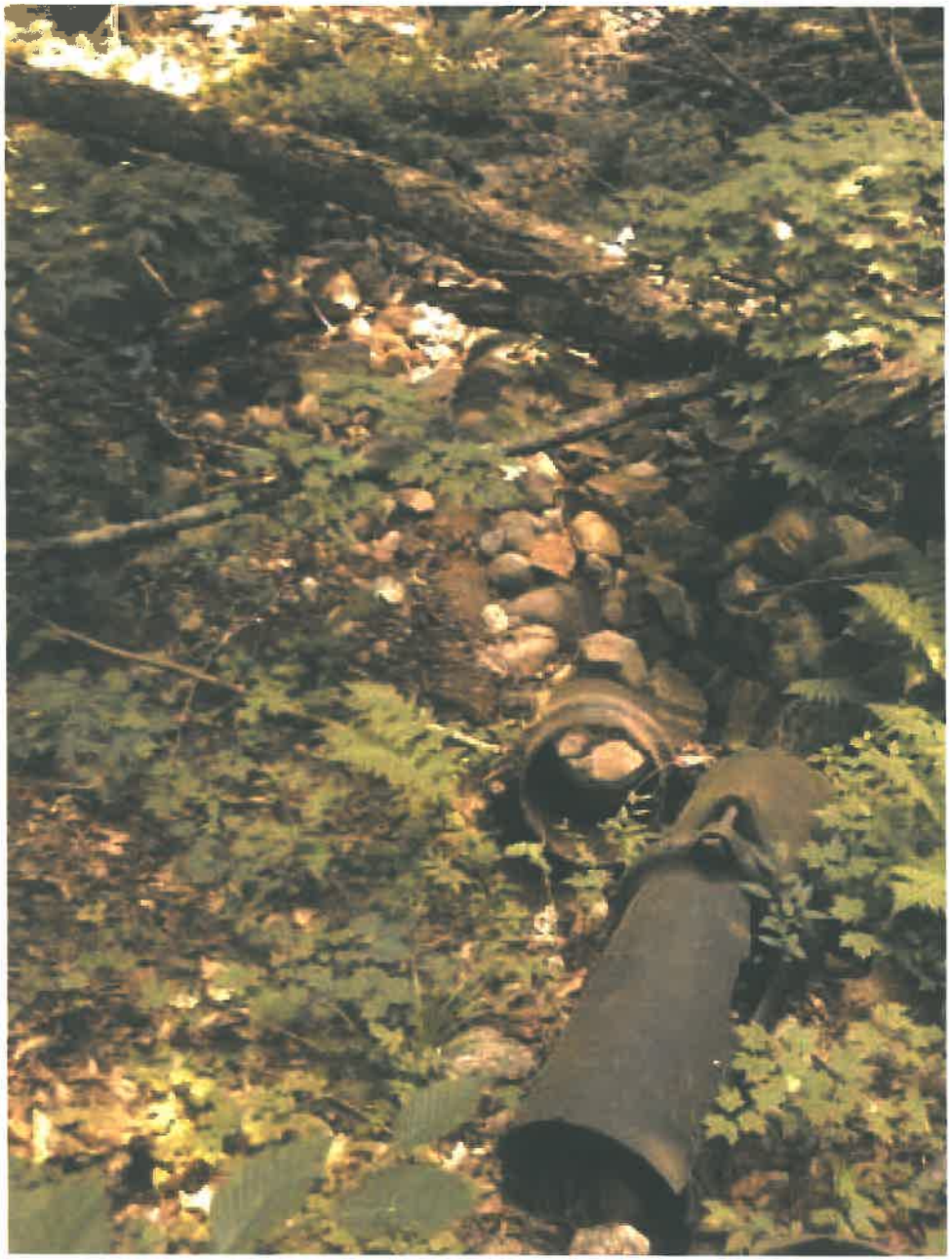
- Fully deteriorated concrete slab sections.
- Failed coal tar pitch sealant between slab sections.
- Failure to meet current requirements for covered storage.

Gooseneck Pond System - Gooseneck Water Main & Dam


EAGLE
LAKE
GOOSENECK
POND







This is what long term liability looks like:

Decrepit Dam

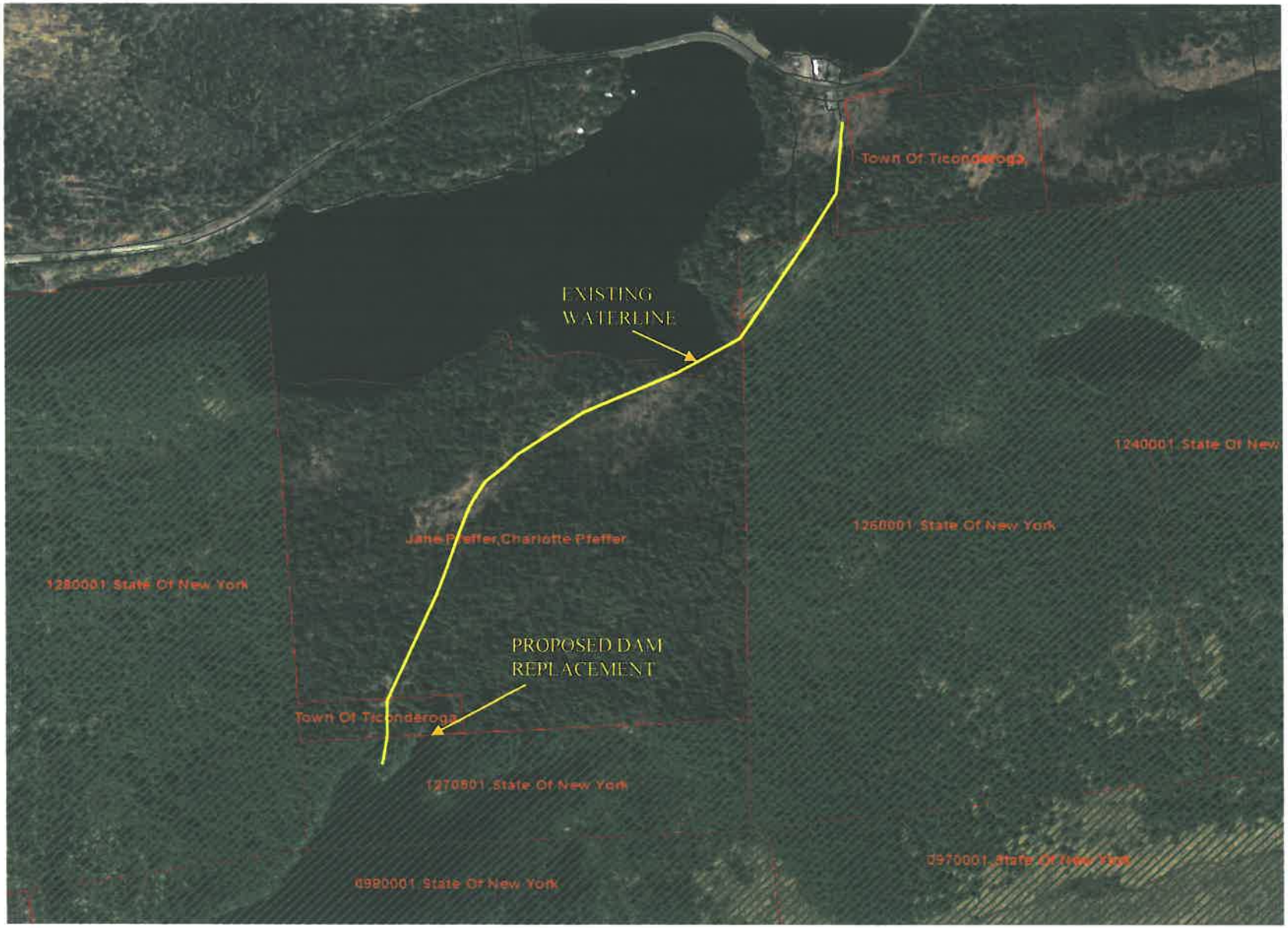
Leaking Dam

Broken Pipe...In Brook

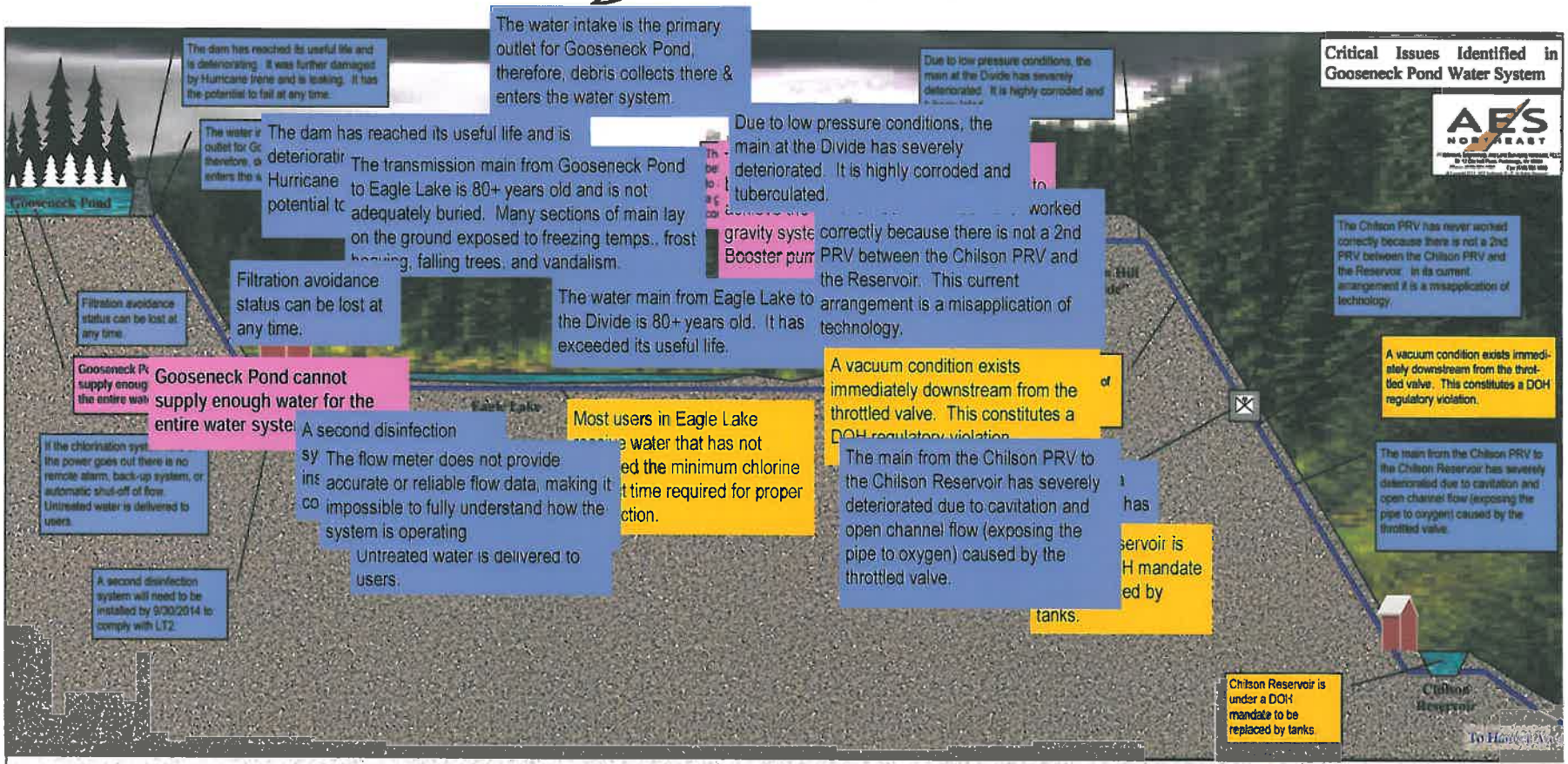
This is what pipe corrosion looks like

Gooseneck Pond & State Forest Preserve

Gooseneck Pond & State Forest Preserve



Gooseneck Pond System: Summary of Deficiencies



Ticonderoga's Gooseneck Pond Water System has been in service since the 1930's. It has provided the community with a clean and reliable source of water. Now, 80+ years later, the system is deteriorating and cannot keep pace with modern regulatory requirements. The Town of Ticonderoga must decide between two courses of action:

1. **Make a significant monetary investment in the Gooseneck System to bring it into compliance with current regulatory requirements and replace aging infrastructure.**

Or

2. **Seek an alternative source of water.**

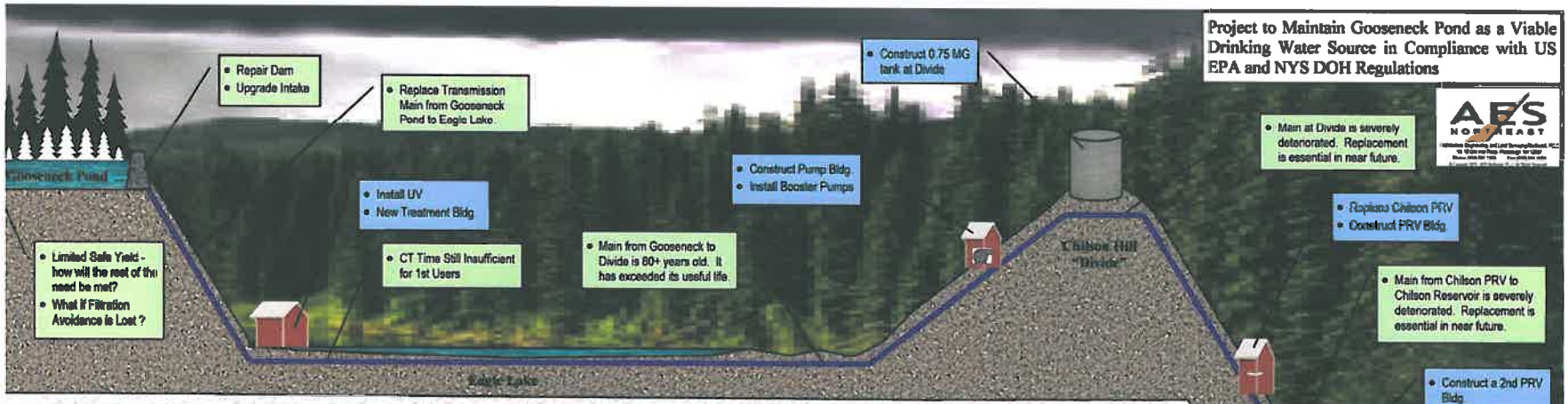
LEGEND

Pink = Immutable fact that must be part of any decision process regarding the future of Gooseneck Pond.

Yellow = Regulatory violations that impact the feasibility of maintaining Gooseneck Pond as a water source.

Blue = Issues identified in the Gooseneck Pond Water System. These items do not constitute a comprehensive list of all issues associated with the system.

Gooseneck Pond System: Summary of Improvements



GRAND TOTAL TO REHABILITATE THE GOOSENECK POND WATER SOURCE = $33,847,000

MINIMUM COST TO MAINTAIN GOOSENECK POND	
UV System	$ 1,500,000
New Treatment Building & Controls	$ 2,000,000
Booster Pump Station	$ 1,300,000
Storage Tank at Divide	$ 2,275,000
Replace Chilson PRV	$ 200,000
New PRV Below Chilson PRV	$ 200,000
Replace Chilson Reservoir w/ Tank(s)	$ 2,825,000
New Chlorine Injection Bldg. @ Chilson	$ 1,600,000
New Water Main - Chilson PRV to Reservoir	$ 1,515,000
New Water Main Along Rt. 74	$ 2,230,000
TOTAL	$ 15,645,000

LONG TERM LIABILITIES FOR GOOSENECK POND	
Dam Repair/Replacement	$ 1,600,000
Intake Structure Repair/Upgrade	$ 500,000
New Filter Plant (Filtration Avoidance Lost)	$ 5,000,000
Replace Gooseneck Transmission Main (GP to EL)	$ 2,000,000
Install Small Main to Serve CT Users	$ 192,000
Replace Main from EL to Divide	$ 6,390,000
Replace Main at Divide	$ 1,200,000
Replace Main from Divide to Chilson PRV	$ 1,320,000
TOTAL	$ 18,202,000

AFTER PROJECT IS COMPLETE GOOSENECK POND ALONE WILL STILL NOT SUPPLY ENOUGH WATER FOR THE COMMUNITY.

LEGEND

Blue = Project items shown in blue constitute the minimum work required to bring the system into compliance with current regulations.

Green = Project items shown in green address underlying issues and upgrades required in the near future to make Gooseneck Pond a feasible and maintainable water source over the life of funding obligations.

Gooseneck Pond Water System Upgrades

$34 MILLION AND STILL NOT ENOUGH WATER TO SERVE THE COMMUNITY.

Baldwin Road System

Baldwin Road Filter Plant

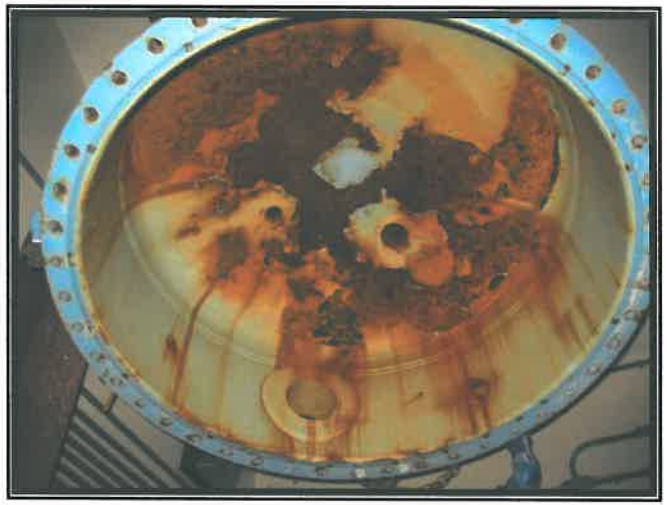
On going Issue that resulted in a DOH Tribunal Order:

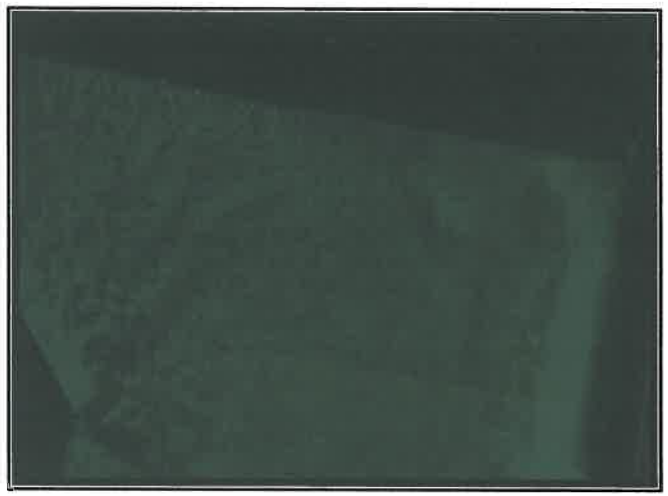
- Clogging and breaking filter septums.
- Improper flow distribution increasing contamination break through.
- Significant deterioration of valves, filter vessels, and filter piping.

Baldwin Road Filter Plant

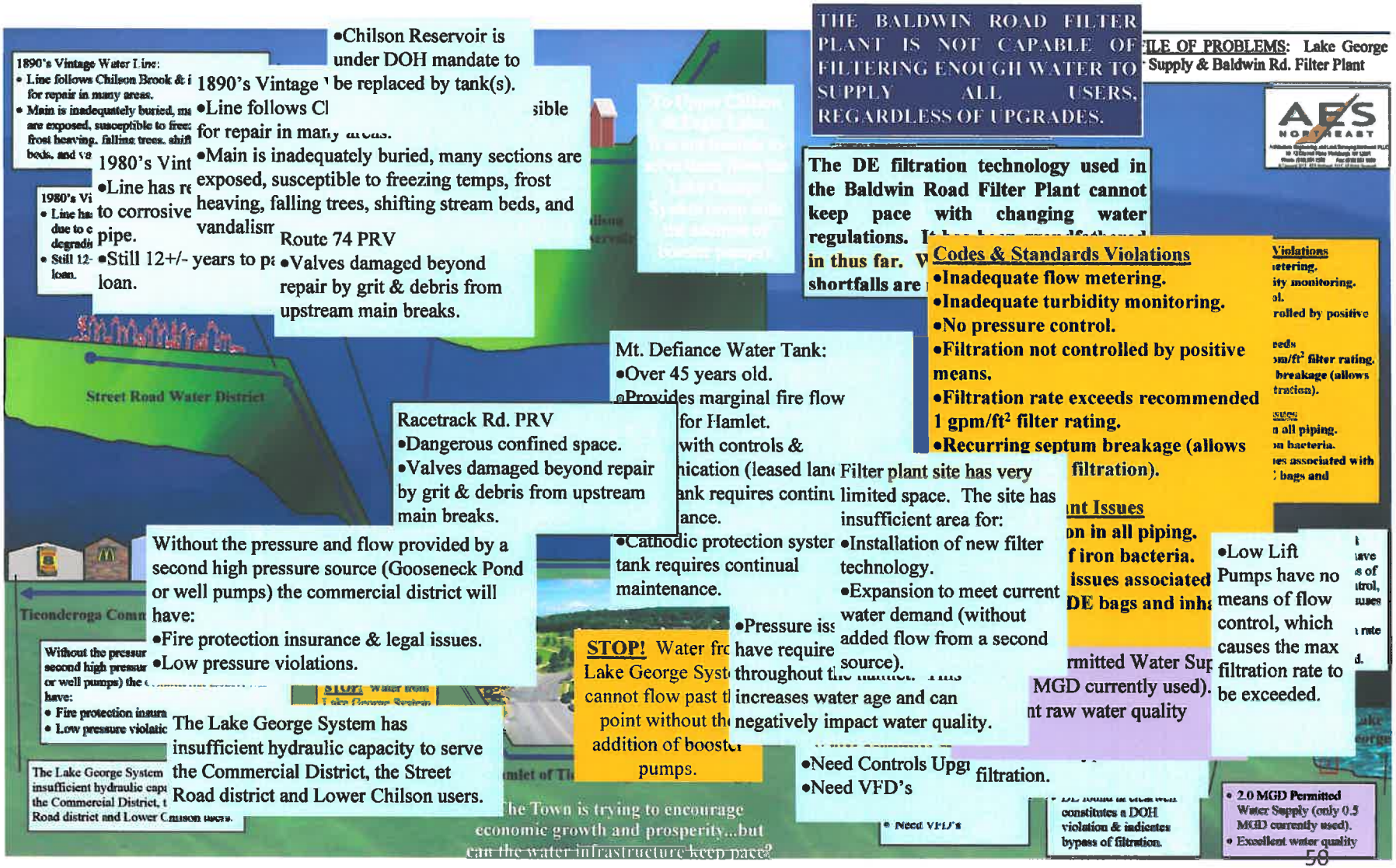
The evidence of repeated failure:

- Diatomaceous Earth ("DE") bleed through in the clear well.
- Diatomaceous Earth in distribution system.
- Limited capacity: Less than design of 1 mgd.

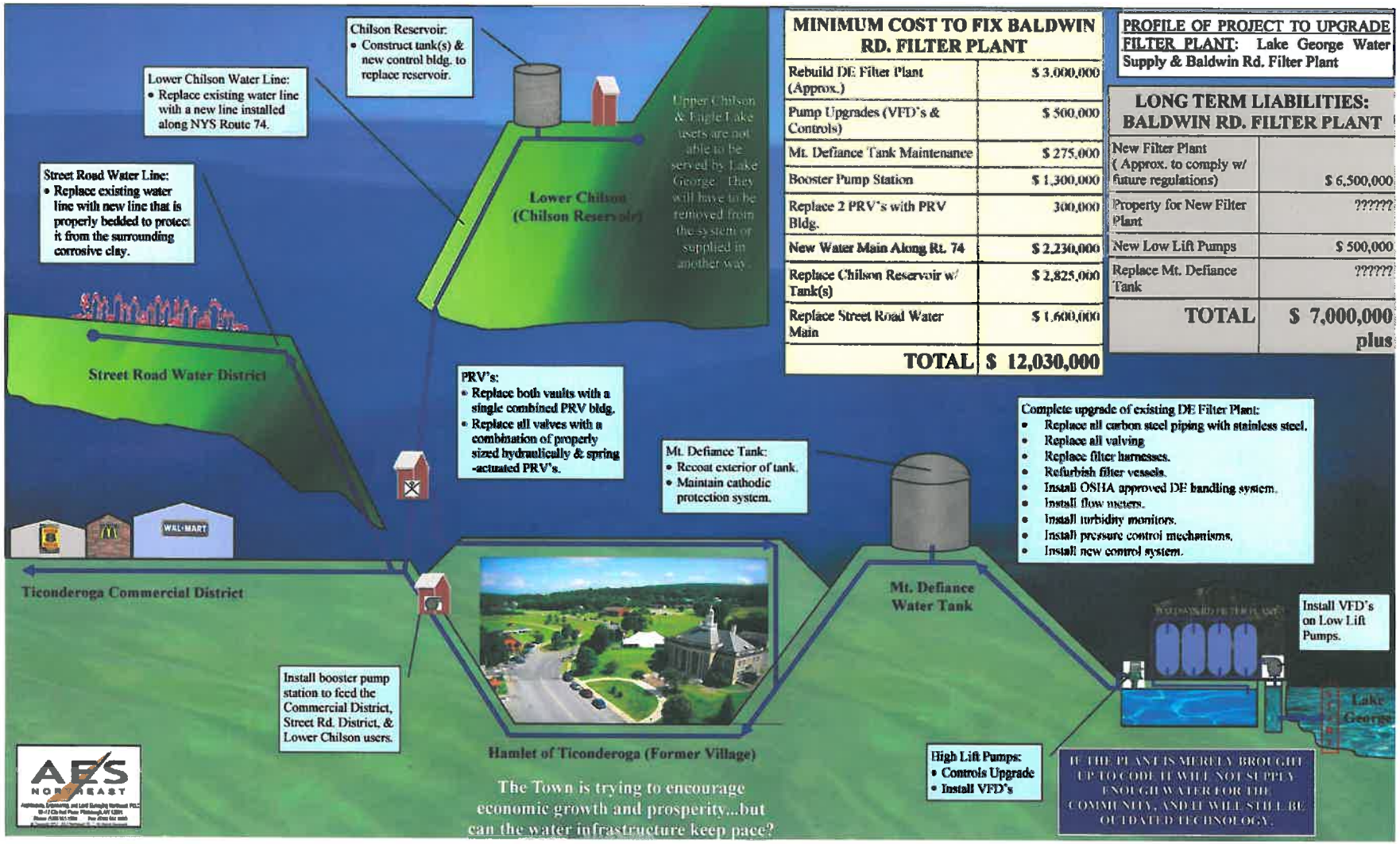




Baldwin Road Filter Plant: Summary of Deficiencies



Baldwin Road Filter Plant: Summary of Improvements



MINIMUM COST TO FIX BALDWIN RD. FILTER PLANT	
Rebuild DE Filter Plant (Approx.)	$ 3,000,000
Pump Upgrades (VFD's & Controls)	$ 500,000
Mt. Defiance Tank Maintenance	$ 275,000
Booster Pump Station	$ 1,300,000
Replace 2 PRV's with PRV Bldg.	300,000
New Water Main Along Rt. 74	$ 2,230,000
Replace Chilson Reservoir w/ Tank(s)	$ 2,825,000
Replace Street Road Water Main	$ 1,600,000
TOTAL	**$ 12,030,000**

PROFILE OF PROJECT TO UPGRADE FILTER PLANT: Lake George Water Supply & Baldwin Rd. Filter Plant

LONG TERM LIABILITIES: BALDWIN RD. FILTER PLANT	
New Filter Plant (Approx. to comply w/ future regulations)	$ 6,500,000
Property for New Filter Plant	??????
New Low Lift Pumps	$ 500,000
Replace Mt. Defiance Tank	??????
TOTAL	**$ 7,000,000 plus**

Question: Gooseneck has served the Town for almost a century, can't we just fix the Gooseneck System?

Can't we just fix Gooseneck

YES, but...

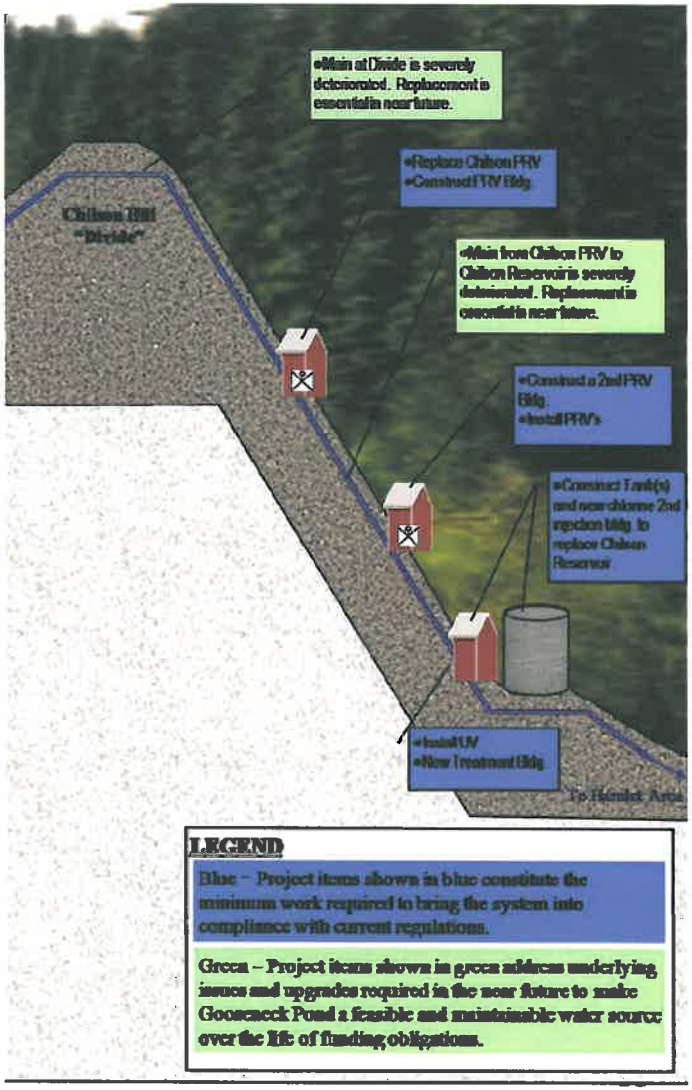
- Must comply with NYS DOH mandates for additional treatment and installation of water storage tanks.
- For the past century to now, the water is deemed treated only downstream from the Chilson Reservoir (basis of current filtration avoidance).

Can't we just fix Gooseneck

Option: Consider Current NYS DOH mandates for Existing Districts only.

MINIMUM COST TO MAINTAIN GOOSENECK POND Assumption: Existing Districts	
UV System (less expensive due to location)	$ 670,000
~~New Treatment Building & Controls~~	~~$ 2,000,000~~
~~Booster Pump Station~~	~~$ 1,300,000~~
~~Storage Tank at Divide~~	~~$ 2,275,000~~
Replace Chilson PRV	$ 200,000
New PRV Below Chilson PRV	$ 200,000
Replace Chilson Reservoir w/ Tank(s)	$ 2,825,000
New Chlorine Injection Bldg. @ Chilson	$ 1,600,000
~~New Water Main – Chilson PRV to Reservoir~~	~~$ 1,515,000~~
New Water Main Along Rt. 74	$ 2,230,000
TOTAL	$ 7,725,000

- Capacity: 0.5 mgd (need another 1 mgd)
- Potentially an option if no additional GW is found
- Long Term Liability: Still roughly $18 million



Can't we just fix Gooseneck?

- The ~$8 million Gooseneck Pond project would address today's most pressing issues, but would not eliminate the need to do major multi-million dollar work in the future.
- Only users below the Chilson Reservoir would be served.

Question: We have a filter plant on Lake George. Can't we just use Lake George?

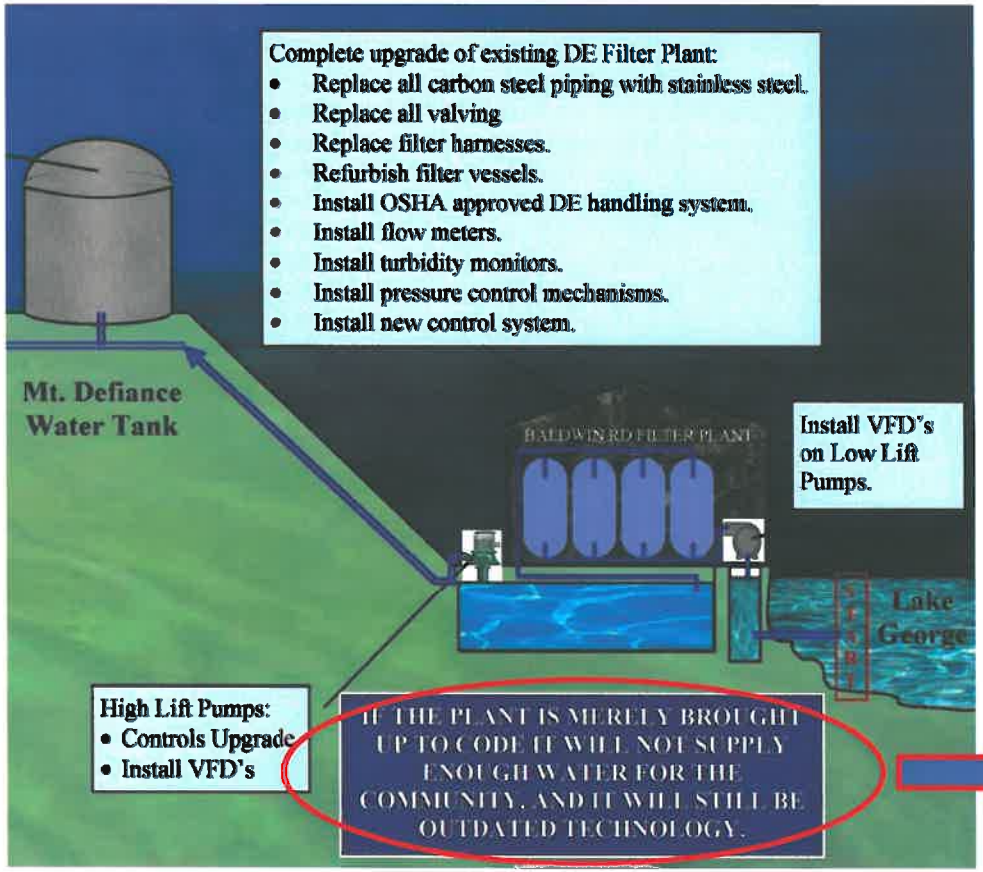
Can't we just use Lake George?

YES, but...

- Must Comply with NYS DOH mandates for reliable service.
- Historically this system has only supplemented the needs of the Town.
- The current filter plant can't supply all districts: Route 9N Commercial District and the Street Road District.
- The filter plant will not be able to serve users above the Chilson Reservoir.

Can't we just use Lake George?

Lets review:



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Replace Street Road Water Main	$ 1,600,000
TOTAL	**$ 12,030,000**

Historically a supplemental supply

Question: This is an enormous project. Can't we do the project in stages?

Can't we do the project in stages?

The first project addressed by the Town was the Chilson reservoir and the integral transmission main (specifically under state mandate)

Chilson Reservoir project with Transmission Main	Project maximum through Environmental Facilities Corporation (IUP)
$ 5,596,875	$ 13,866,248
$ 520	$ 565
Qualifies for fair market rate loan for 30 years, no grant	Qualifies for 0% loan and potential for grant
Other mandates not addressed resulting in future costs	State mandates addressed in one project due to project "Score"

User rates estimated at this point, contingent on a complete finance package.

Question: I live in Upper Chilson and I have always paid for my water. Why have I heard that Chilson and Eagle Lake residents are losing water service?

Why have I heard that Chilson & Eagle Lake residents are losing water service?

- The Short Answer: State Law

- The Long Answer: Requires more time than can be allocated here. If you live in the Eagle Lake or Chilson area please pick up an informational flyer.

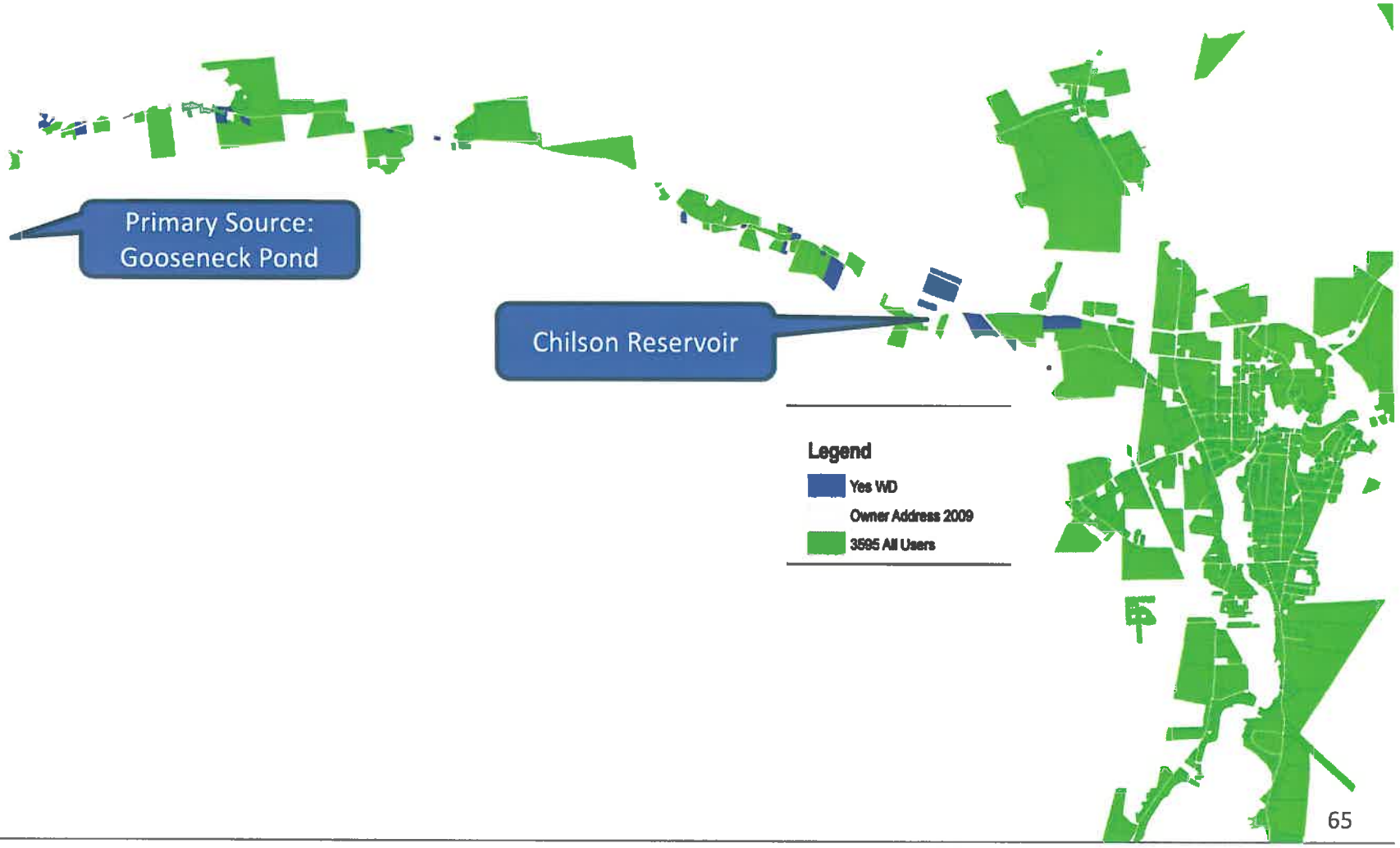
- NOTE!: The residents of Chilson & Eagle Lake don't have to lose water, but they must become engaged in the project and provide their input.

Why have I heard that Chilson & Eagle Lake residents are losing water service?

SHORT ANSWER:

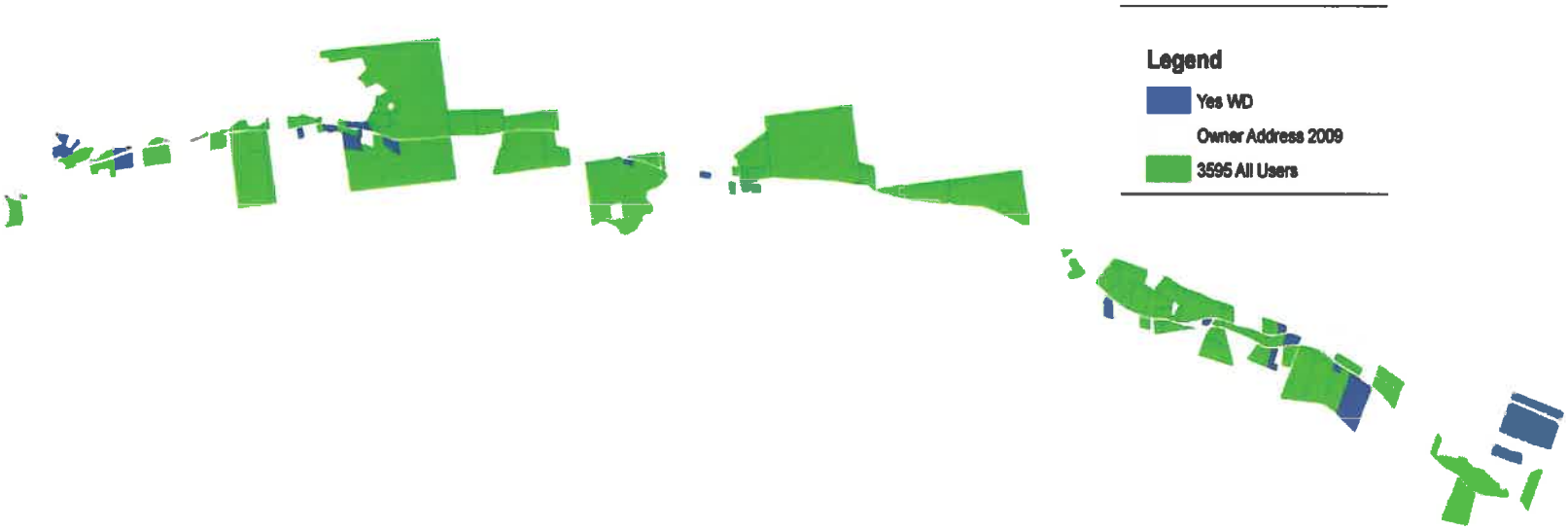
- NYS Law requires that all water users be a part of a water district. A water district is a legal agreement between a water department and its customers that states that the water department will supply water and the water users will pay for the water they use.
- This protects both the water department (assurance they will be paid) and the user (assurance that they will receive water).
- The Chilson & Eagle Lake users are not in a district and the Town may reach a point where it cannot serve these users water.

District Formation: Chilson and Eagle Lake Questionnaire 2010 results



Question: I live in Eagle Lake, how much is it going to cost to keep my water?

How much will it cost for water in Eagle Lake?



It takes input to develop a plan

It takes a plan to create a cost estimate

But lets take a guess…. (a plan without input)

How much will it cost for water in Eagle Lake?

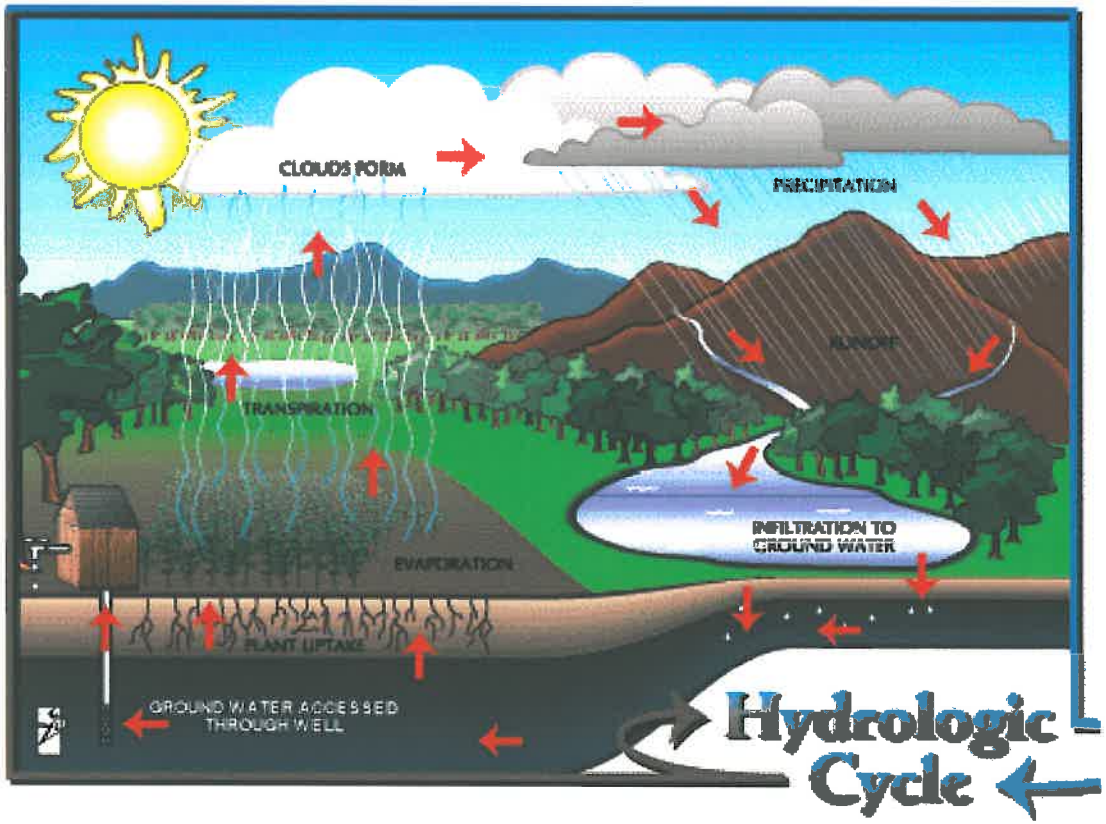
Hypothetical Scenario	Hypothetical Project Costs	Hypothetical User Rate w/O&M	Comments
If Gooseneck Pond is utilized by the Village... and Chilson/Eagle Lake form a district	$ 22,480,774	$ 738.48	Capital cost exceeds finance capability (loss of zero interest loan and grant). Must be split into (2) successive projects.
If a well is developed in Eagle Lake, used by the Village... and Chilson/Eagle Lake form a district	$ 17,475,488	$ 642.32	Capital cost exceeds finance capability (loss of zero interest loan and grant). Need further GW investigation
If Eagle Lake and Chilson are served by their own ground water source.	$ 5,456,063	$ 1,335.02	User Cost is Very High

The fine print: Assumes projects qualify for 0% financing, with 2 million in hardship grant. Assumes every one is in a district (it is a requirement of the financing). Some options assume there is a mutually beneficial use between districts.

Question: We live right next to Lake George and Lake Champlain. Why are we looking for groundwater?

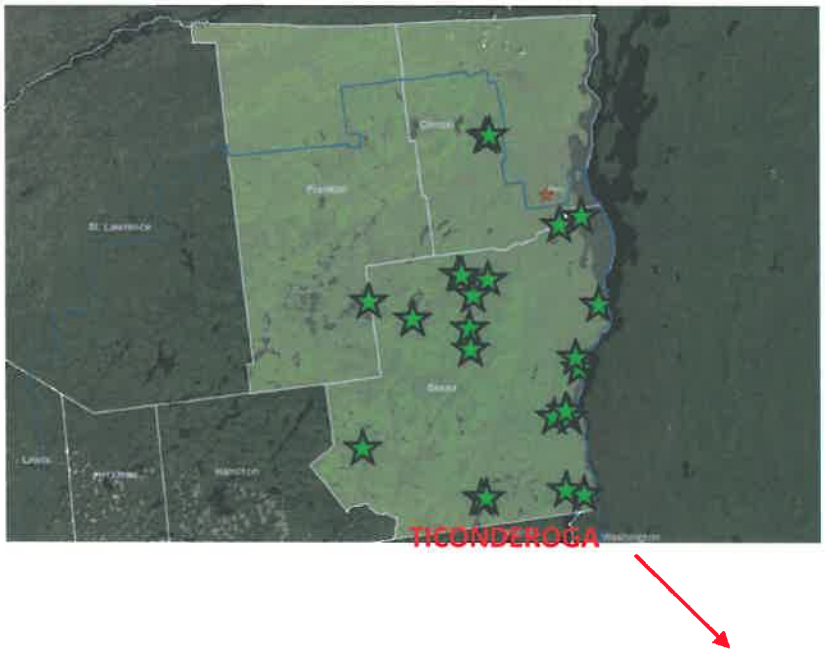
Why are we looking for groundwater?

- If sufficient groundwater is found it will be the most affordable source of water in both the short term and long term.
- Groundwater takes advantage of natural filtration, saving the expense of a filter plant.



Question: Why are you drilling wells in the most ridiculous locations?

Why are you drilling wells in the most ridiculous locations?

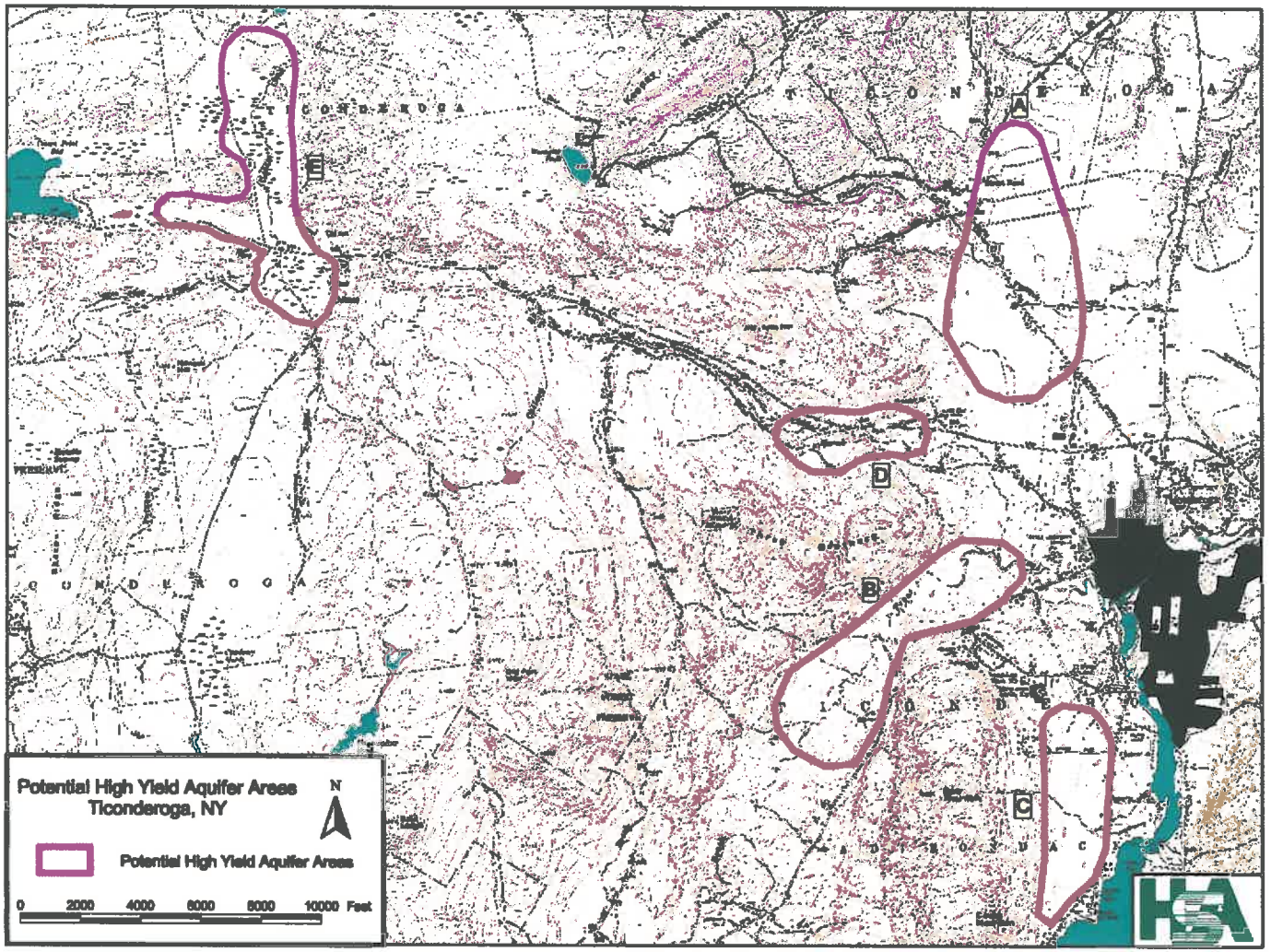


Here are a few other ridiculous locations:

- Crown Point: 500,000 gpd
- Elizabeth Town: 360,00 gpd
- Old Forge: 2 million gpd
- Houghton: 2 million gpd
- Lyons Falls: 2.7 million gpd
- Marathon: 650,000 gpd
- Sandy Creek: 680,000 gpd
- Malone: 2.9 million gpd
- Saranac Lake: 4.3 million gpd

…and counting.

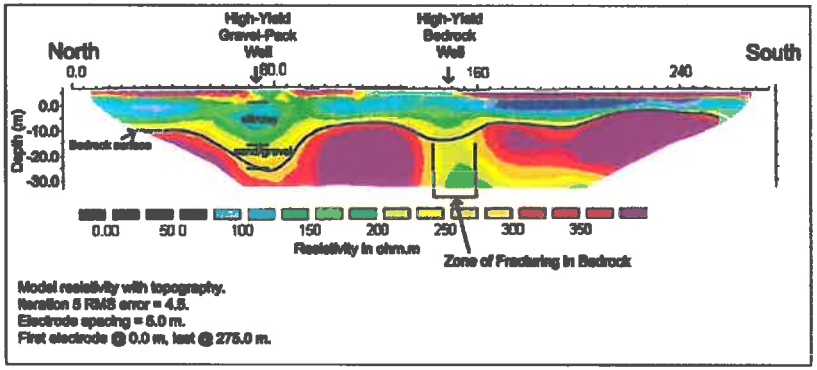
Why are you drilling wells in the most ridiculous locations?



Why are you drilling wells in the most ridiculous locations?

Example Resistivity Cross Section

Showing inferred bedrock surface, locations of gravel-pack and bedrock wells.



The selected sites ...

....and how we locate a gravel well.

Why are you drilling wells in the most ridiculous locations?

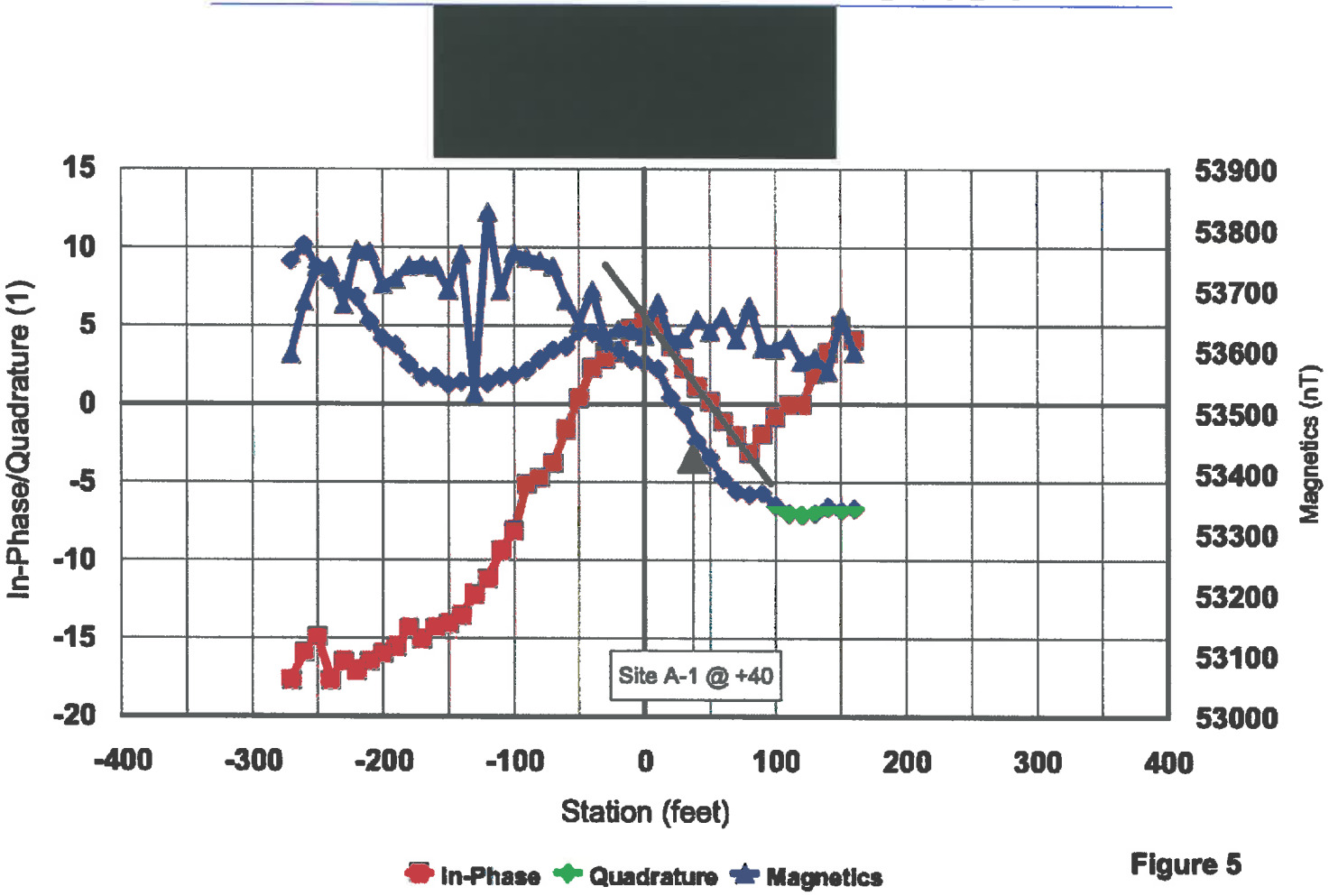


Figure 5

Why are you drilling wells in the most ridiculous locations?

The selected Sites…

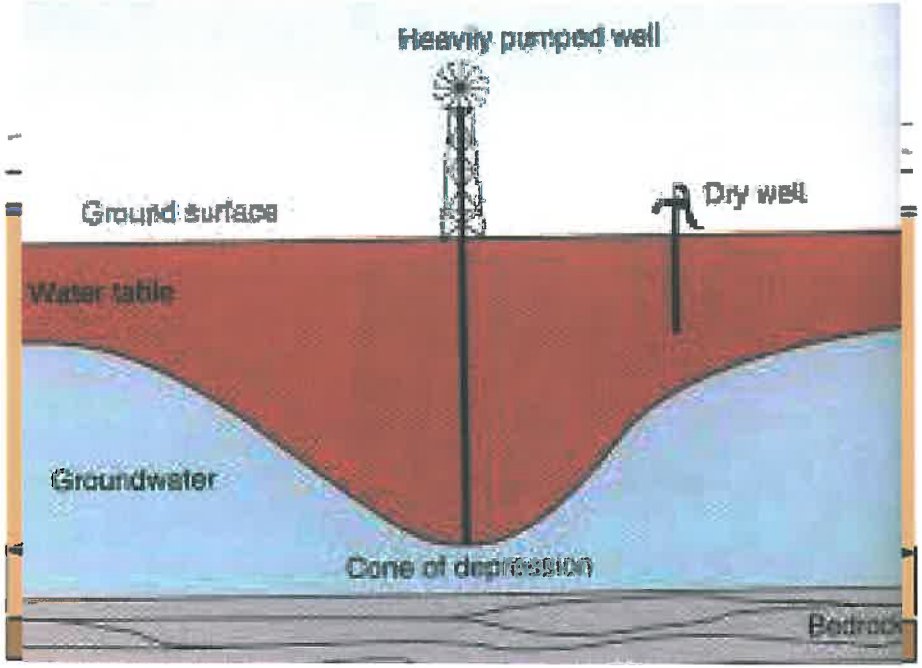
…and the results:

- Upper Chilson (Hall Road) – fracture located, non water bearing.
- Existing Chilson Tank Site – fracture located, insufficient yield.
- Street Road – High yield potential (estimated 500,000 gpd)

Question: I have heard about a lot of people having their well go dry. Isn't a well a risky prospect for the Town's water supply?

How will a Town well impact existing wells?

- During well trials tests are run to ensure that the wells do not remove more water than the aquifer can sustain.
- Area wells are monitored during well development to determine impacts.

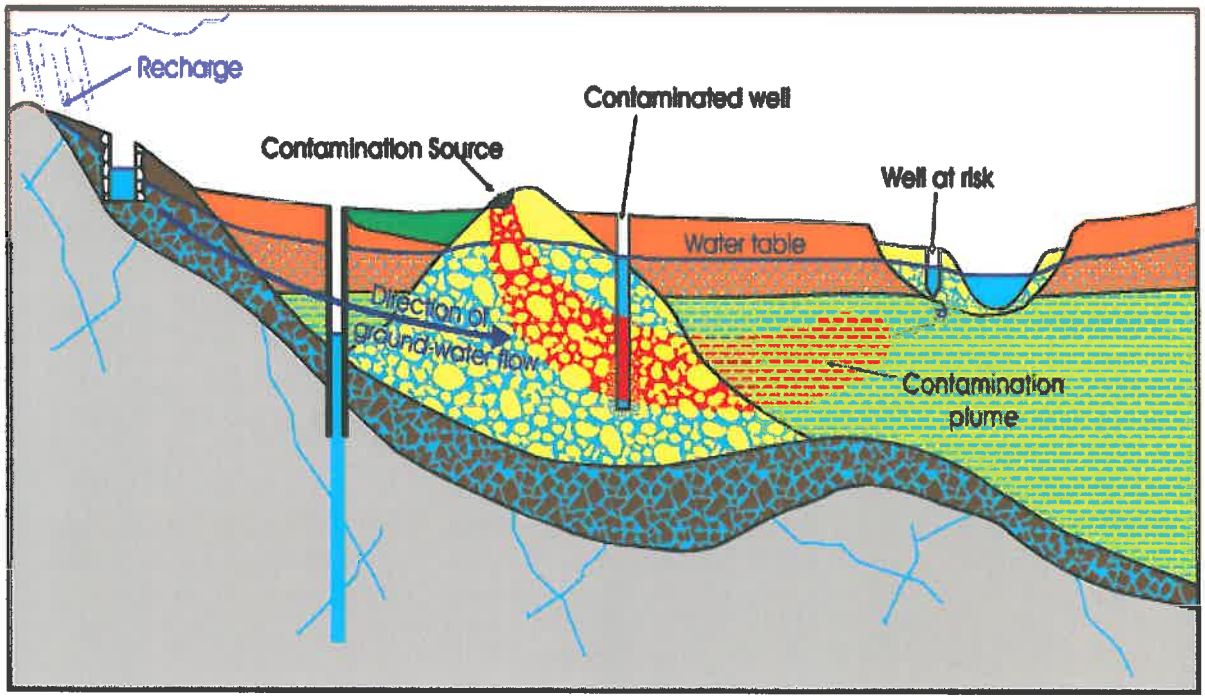


State Regulations require evaluation of impacts to area wells and the Town will be obligated to mitigate those impacts.

Question: I read a lot about wells being contaminated. Is it true that wells are more susceptible to contamination?

Are wells subject to Contamination?

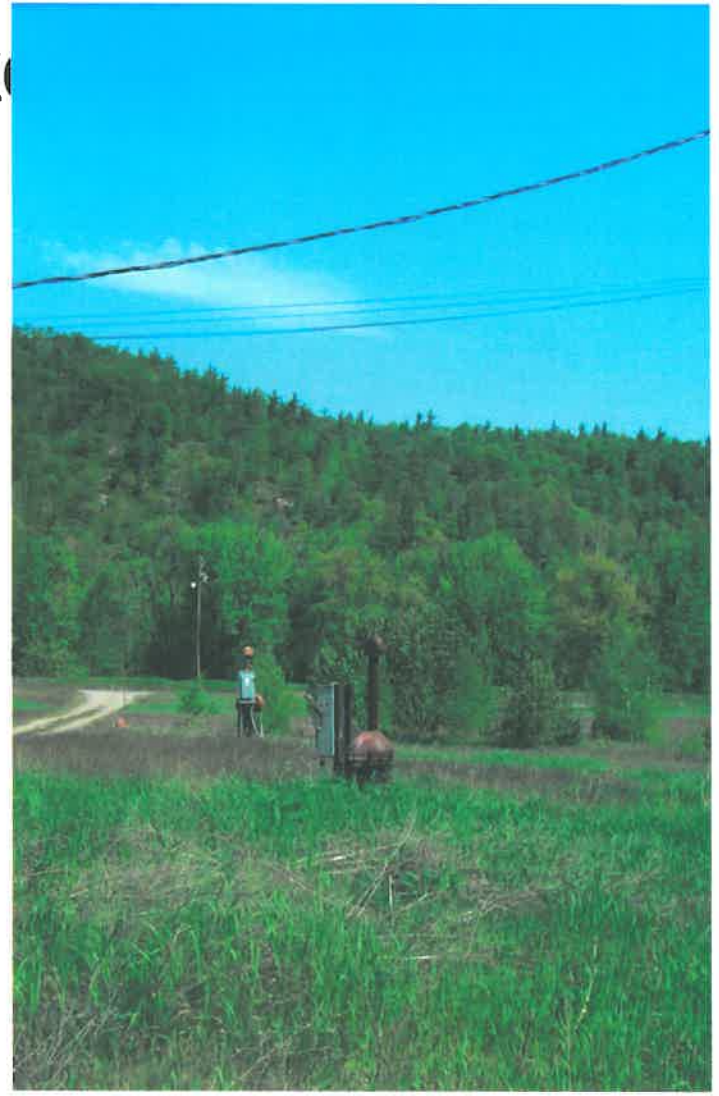
- All sources are subject to contamination.
- A risk assessment will be performed for each potential source.



Ground water investigations include evaluation of these risks and include testing for suspect contamination.

Question: Are wells more susceptible to damage from earthquakes?

Are wells more susceptible to earthquak



A well is no more susceptible to damage from an earthquake than any other buried pipe. More at risk of earthquake damage is the Gooseneck Pond dam.

Question: I keep hearing about sinkholes in the news. Does pumping water from a municipal well create sinkholes?

Does pumping water from a well create sinkholes?

- Not in the type of soil found in Ticonderoga.
- Sinkholes are mainly caused when slightly acidic groundwater dissolves limestone or sandstone.
- Beneath the surface of Ticonderoga is sand, gravel, glacial till, and granite. These are materials that maintain their structure.

Is my water safe to drink?

That depends…

"Some people may be more vulnerable to disease causing microorganisms or pathogens in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice from their health care provider about their drinking water. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium, Giardia and other microbial pathogens are available from the Safe Drinking Water Hotline (800-426-4791)."

- Ticonderoga Annual Water Quality Report

What are the next steps?

- Complete current ground water investigation: Currently discussed sites, Additional sites, Evaluate the facts.
- Investigate Gooseneck Pond Dam, and NYS DEC access for improvements.
- District Formation.

The Town Board has been methodically moving through these options gaining the information necessary to make this critical decision.