



The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner



August 7, 2017

BOARD OF SELECTMEN
PO BOX 343
GREENVILLE NH 03048

Subject: Greenville Water Department PES #0991010
Sanitary Survey 2017

Dear Members of the Board:

On June 28, 2017, I conducted a sanitary survey on the public water system served by the Greenville Water Department (GWD). The purpose of the survey was to review the capacity of the water system's sources, treatment, distribution, and management to continually produce safe drinking water. I would like to thank David Brennan, water system operator, for his assistance in conducting this survey.

SUMMARY

GWD is operated in a professional manner and staff is very knowledgeable of the components and operation of the water system. The most recent water quality monitoring records show that the system is in compliance with all water quality standards, including lead and copper levels. This sanitary survey did not identify any significant deficiencies.

The following is a list of issues that we recommend the managers of the water system consider to maintain compliance, and continue to provide an acceptable level of service to the system's customers:

- Clean the water treatment plant (WTP) lagoons on a regular basis.
- Provide containment and coding on the chemical feed lines at the WTP.
- Perform maintenance on the coagulation tank hatch at the WTP that won't close.
- Consider a new service to the wastewater treatment plant (WWTP) and highway garage.
- Troubleshoot and provide more accurate water use data.
- Perform a complete Asset Management program for the entire water system.

A more descriptive discussion on each of these issues is included below under "Recommendations".

SYSTEM DESCRIPTION

General

The Greenville Water Department consists of a raw water intake and pumping station at Toby Reservoir, conventional filtration plant of nominal 0.425 mg capacity, two storage tanks, and an associated distribution network. The system serves domestic and fire flow to about 440 connections and a population of about 1,100. In addition, the water system provides wholesale water to Greenville Estate Village District, which serves approximately 192 mobile homes. There are also a few customers within the towns of New Ipswich and Temple.

Reported average daily use in recent years is approximately 180,000 gallons per day (gpd). The largest user, Pilgrim's Food, increases the system demand during the week to approximately 150 gpm whereas the weekend typical runs at 100 gpm. In 2016, peak days were reported during summer months at greater than 250,000 gpd. The system is operated under contract with Utility Partners and with the assistance of Town staff.

Water Sources / Treatment / Pumps, Pumping Facilities, and Controls

A filtration plant was constructed in conjunction with the construction of Toby Reservoir in 1968 and expanded in 2000. Unscreened raw water enters a wet well at the raw water pump house and is conducted to the filtration plant via dual alternating vertical turbine pumps, replaced with new pumps this year. Water is pretreated at the plant by injection of sodium aluminate and aluminum sulfate prior to a static mixer, followed by dual trains of flocc basins and sedimentation tanks. Settled water is sent to two dual media IDI traveling bridge filters. Filtered water enters a 26,000-gallon chlorine contact tank, followed by a clearwell, from which dual variable speed high lift pumps boost pressure to the distribution system. The high lift pumps were also replaced with new pumps this year.

Plant operations are controlled through a SCADA system, which can be accessed remotely to monitor plant operations. Raw water pumps and plant flow rates are paced manually on clearwell level. Finished water pumps are activated on distribution storage tank level, currently at the Barrett Hill tank.

The sedimentation tanks are equipped with traveling siphon sludge removal mechanisms which cycle at 3-day intervals. The filters are equipped with IDI traveling bridge backwash mechanisms that operate on time or filter head loss. Following backwash, each backwashed cell goes through a filter-to-waste cycle before being returned to service. Plant waste flows, including sedimentation tank sludge, filter backwash, and filter-to-waste flows, are sent to dual un-lined earthen lagoons adjacent to the plant. All waste flow permeates into the groundwater, and there is no discharge to surface water.

Finished Water Storage

The distribution system has a single pressure zone and two storage tanks. The 600,000-gallon Barrett Hill tank is a precast, concrete (Natgun) tank constructed in 2000 and is in good condition. This tank was last inspected in 2013 and is scheduled for its regularly scheduled inspection in August of this year.

The 150,000-gallon Adams Hill tank was completely rehabbed in 2013 and is also scheduled for inspection in August. The Adams Hill Tank is also having a mixer installed. Both tanks appear to be in good condition. An underground meter pit and level control vault is installed at each tank site.

Distribution System

The single pressure zone distribution system consists of 4-inch to 12-inch ductile iron pipe, with a lesser amount of asbestos-cement pipe in the Adams Hill section. Distribution flushing is carried out twice annually as is recommended. Customer services are equipped with radio read meters and dual check backflow preventers. The Town has a cross connection control ordinance, and testing of backflow devices is performed by an outside contractor. The Town is up to date with their annual reporting to DES of testable backflow devices.

A single 4-inch service line runs approximately 2,000 feet after Pilgrim's Food to serve the WWTP and highway garage.

Monitoring, Reporting, and Data Verification

Water quality monitoring records show that the system is in compliance with current standards including lead and copper.

Water System Management and Operation

The GWD recently completed an asset management plan (AMP) on for the work at the WTP. The Department should consider completing an AMP for the entire system to help maintain a high level of service to the customers.

Staffing and Operator Certification

The Greenville Water Department is required to retain an operator certified at the Grade III treatment level and the Grade II distribution level. The current operators are qualified for operation of this water system. The following operators are listed as operators for this system:

<u>Operator</u>	<u>Certificate No.</u>	<u>Treatment Level</u>	<u>Distribution Level</u>
David Brennan	1232	IV	IV
Robert Lauricella	2359	III	-

ACKNOWLEDGEMENTS

The following are among the positive features which were noted during this survey and for which we commend the water department:

1. System staff interviewed as part of this survey are very knowledgeable about the water system and approach their jobs in a professional manner.
2. The filtration plant has produced water exceeding all water quality standards since its expansion in 2000. This performance, plus the fact that the plant is kept in exceptionally clean condition, should be a source of pride to the operators and the Town.
3. We commend the GWD for upgrading areas of need at the WTP through the replacement of the raw water and finished water (high lift) pumps. This project also required a diver's inspection of the intake structure. The information gained from this inspection can be used for future planning.

RECOMMENDATIONS

Below are areas where improvements or operating adjustments are recommended, some of which could lead to significant deficiencies in the future if not addressed:

Treatment

1. Discharge of backwash and filter-to-waste flows are piped to two earthen lagoons adjacent to the plant. One of the lagoons was recently cleaned. However, the other lagoon needs to be cleaned and

brought back to original capacity. The cleaning should be part of regularly scheduled maintenance either through a standard maintenance plan or an asset management plan.

2. Several chemical feed lines inside the WTP are currently being transported from one area to another in tubing without containment piping or color coding. This presents a safety hazard to the operators and anyone performing work on those lines without knowing what chemical is inside the tubing. These chemical lines should be immediately installed in proper conduits, labelled, and coded.
3. The hatch located above the coagulation tank at the WTP will not close all of the way. This provides a potential contamination source into the treated water supply at the WTP and should be fixed.

Distribution System

1. The Town should consider installing a new, smaller service line to the WWTP and highway garage. The existing 4-inch line could be maintained for fire protection, but currently allows for increased water age and deteriorating water quality with such a large volume of water in the 2,000 feet. A new ½-inch service line would help to maintain the water quality being provided to the town's employees at this location.

Monitoring, Reporting, and Data Verification

1. The reported water use data from the WTP started to exceed the water use data reported from Toby reservoir in late 2014. Since the Toby Reservoir is the source water, there should always be more water accounted for from the Reservoir than put into the distribution system from the WTP on a monthly basis. We recommend that the GWD investigate the discrepancy, possible starting with a calibration of the flow meters for each source.

Water System Management and Operation

1. Our Asset Management Grant program was discussed as part of this survey. This program offers a matching grant up to \$20,000 for water systems to hire a consultant engineer to perform a system assessment and begin asset management initiatives. We would recommend the GWD again consider applying for this grant to continue establishing a full system AMP. This will help determine the priority of system upgrades required to maintain the desired level of service provided to customers.

It is also important that water systems maintain records of existing conditions and upgrades to the distribution system. Conversion from paper to electronic format should also be included in the asset management plan. Contact Luis Adorno at 271-2472 or Luis.Adorno@des.nh.gov for more information about our Asset Management program.

As a general reminder, RSA 485:8 states that no new construction, addition, or alteration involving the source, treatment, distribution, or storage of water in any public water system or privately owned redistribution system shall be commenced until the plans and specifications have been submitted to and approved in accordance with rules adopted by the department; except, if such construction, addition, or

alteration is exempted by the department because it will have no effect on public health or welfare, then such submission and approval is not required.

If you have any questions regarding this sanitary survey please contact me at 271-1746 or Randal.Suozzo@des.nh.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Randal A. Suozzo".

Randal A. Suozzo, P.E.
Drinking Water and Groundwater Bureau

cc: Dave Brennan, Water System Operator