

The State of New Hampshire  
**Department of Environmental Services**

**Thomas S. Burack, Commissioner**

*Celebrating 25 Years of Protecting  
New Hampshire's Environment*



**WATER CONSERVATION PLAN APPROVAL**

June 19, 2012

Tenney Mountain Association  
Tenney Village Condominium Association  
c/o Jack Scarborough  
P.O. Box 186  
Plymouth, NH 03264

**RE:** Plymouth – Tenney Brook II (PWS ID #: 1942010)  
Water Conservation Plan, June 5, 2012, NHDES # 999137

Dear Mr. Scarborough:

On June 19, 2012, the New Hampshire Department of Environmental Services (“DES”) Drinking Water and Groundwater Bureau received a Water Conservation Plan, dated June 5, 2012, for the Tenney Brook II water system located in Plymouth, New Hampshire (the “Plan”). Pursuant to RSA 485:61 and Env-Wq 2101, community water systems seeking permits from DES for new sources of groundwater shall submit a water conservation plan to DES. Based on review of the Plan, DES has determined the Plan complies with Env-Wq 2101.06, *Requirements for Existing Small Community Water Systems*.

Pursuant to Env-Wq 2101.11, the Town of Plymouth and the North Country Council were provided the opportunity to comment on the Plan from April 1, 2012, the date of public notification, through May 18, 2012. DES received no comments.

**Approval Conditions:**

1. By **June 18, 2013**, Tenney II shall submit to DES results of the preliminary and follow up nighttime flow analysis (gpm); the number, location, type, and size of leaks detected; leaks repaired; and a proposed baseline flow to trigger future leak detection. Tenney II shall establish a baseline flow as instructed in the Plan and more specifically as follows:
  - a. Install an AWWA certified distribution meter;
  - b. Conduct a night flow analysis;
  - c. Use a valving technique to narrow down any potential leaks;
  - d. Conduct an acoustic leak detection survey in areas of potential leakage to pinpoint the leaks;
  - e. Repair leaks; and
  - f. Conduct another night flow analysis to determine an appropriate base line low flow.

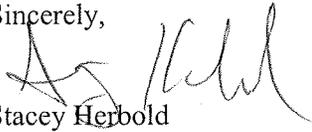
[www.des.nh.gov](http://www.des.nh.gov)

29 Hazen Drive • PO Box 95 • Concord, NH 03302-0095  
Telephone: (603) 271-2513 • Fax: (603) 271-5171 • TDD Access: Relay NH 1-800-735-2964

2. On **June 18, 2015**, and every three years thereafter, the water system shall submit a detailed and completed compliance report form to DES documenting compliance with the Plan. Required information includes contact information for the water-system owner and for the individual responsible for carrying out plan tasks; dates tasks were performed; and data relating to meter reading, water audits, leak detection, and public outreach. A copy of the *Water Conservation Plan Ongoing Compliance Form* may located by going to the DES website, [www.des.nh.gov](http://www.des.nh.gov), clicking on the "A-Z List" in the top right corner of the page, and scrolling down to Water Conservation.
3. Tenney II is a registered water user (WUID # 20898) with the DES Water Use Registration and Reporting Program. The system shall begin utilizing the Onestop reporting tool, rather than the paper form, to submit water use data quarterly for the existing well, and once connected, the proposed well. Instructions for using the tool are enclosed with this letter. If you have any questions about Water Use Registration and Reporting or registering as a data provider please contact Derek Bennett at 271-6685 or [derek.bennett@des.nh.gov](mailto:derek.bennett@des.nh.gov).
4. Revisions to the Plan shall not be implemented without further approval from DES.

Please feel free to contact me with any questions at (603) 271-0659 or via e-mail at [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov).

Sincerely,



Stacey Herbold  
Water Conservation Program  
Drinking Water and Groundwater Bureau

*Encl: Water Use Reporting instructions*

cc: Diana Morgan, NHDES  
Town of Plymouth  
North Country Council



The State of New Hampshire  
**DEPARTMENT OF ENVIRONMENTAL SERVICES**



**Thomas S. Burack, Commissioner**

May 20, 2014

Tenney Village Condominium Association  
c/o Patricia Webster  
P.O. Box 186  
Plymouth, NH 03264

**RE:** Plymouth – Tenney Brook II (PWS ID #: 1942010)  
Water Conservation Plan, Amended Night Flow Methodology

Dear Ms. Webster:

On April 30, 2014 and May 19, 2014, the New Hampshire Department of Environmental Services (DES) Drinking Water and Groundwater Bureau received a night flow analysis and amended night flow methodology from Pump Systems Inc. for the Tenny Brook II water system, located in Plymouth, New Hampshire. The information was submitted in a response to a condition of the Water Conservation Plan (WCP) Approval issued on June 19, 2012. Specifically, the condition required the system to establish baseline flows for analyzing night flows.

The initial night flow analysis indicated low flows consistently reached 0.3 gpm, indicating that the system is currently fairly tight – a leak of this size would be difficult if not impossible to find. DES accepts 0.3 gpm as the baseline flow, as well as the attached amended night flow methodology.

Tenney Brook II shall continue to conduct night flow analysis no less than once a year and in accordance with the night flow methodology. Night flow results and a brief analysis of those results shall be maintained by Tenney Brook II and submitted with the Water Conservation Plan Ongoing Compliance Report Form, due every three years from approval of the WCP. The next compliance report is due on **June 12, 2015**.

A copy of the approved WCP and *Ongoing Compliance Report Form* and a copy of Tenney Brook II's WCP may be located at [www.des.nh.gov](http://www.des.nh.gov). (Click on the "A-Z List" in the top right corner, scroll down to "Water Conservation" and click.)

Please feel free to contact me with any questions at (603) 271-6989 or via e-mail at [stacey.herbold@des.nh.gov](mailto:stacey.herbold@des.nh.gov).

Sincerely,

Stacey Herbold  
Water Conservation Program  
Drinking Water and Groundwater Bureau

*Encl: Night Flow Methodology*

ec: John Benham, Primary Operator

5/19/2014

## Tenney Brook II Water Conservation Plan: Amendment Night Flow Analysis

### Night Flow Analysis

1. A temporary flow meter in the upper PRV chamber will be used to conduct night flow analysis to determine if leakage is present and identify/target which branch/branches of the system the leak(s) might be located on.
2. On **April 30, 2014**, baseline flow was determined to be **0.3 gpm**.
3. Once a year and within 7 days of the date which water usage was recorded to establish the baseline flow, water usage will be recorded every minute for one hour between 1am and 3am. Prior to the night flow analysis, users of the system will be requested to refrain from using water between 1 am and 3 am on this date.
4. If flows are above the baseline, then flows will continue to be recorded for an additional hour.
5. If flows are more than **.70 gpm** above the baseline, a leak will immediately be suspected and Step 8 will be taken.
6. If flows are still above the baseline, but no more than **0.35 gpm** above baseline, all residents will be asked to check their homes for leaks including running toilets. Step 3 will then be repeated again in **14 days**.
7. If again flows are above the baseline, Step 8 will be taken.
8. If a leak is suspected, valves will be closed to isolate select portions of the system and to evaluate the change in flow as measured by the distribution meter to isolate the leak. For example, when one valve is closed, one person in the field (operating the valves) will then communicate with a second person observing the distribution meter to monitor for a change in the background flow.
9. No later than two weeks from isolating the leak to a certain branch of a system, a sub-contractor skilled in acoustic leak detection will be retained and assist with pinpointing the leak.
10. Leak detection will be conducted in accordance with “Manual of Water Supply Practices M36, Water Audits and Loss Control Programs” (American Water Works Association, 2009).
11. Leaks will be repaired within 60 days of discovery unless a waiver is obtained in accordance with Env-Wq 2101.09.

## Tenney Brook II and Eagle's Nest Water System Water Conservation Plan

June 5, 2012

### Project Owner and Contacts:

Tenney Mountain Association  
Tenney Village Condominium Association  
c/o Jack Scarborough  
P.O. Box 186  
Plymouth, NH 03264  
(603) 536-1164  
jackscar@adelphia.net

David Lorey, Property Manager  
Riverbrook Management  
(603) 530-2055  
Morlynnmr@aol.com

John Benham, Primary Operator  
Pump Systems Inc  
PO Box 269  
Franklin, NH 03235-6101  
(603) 934-7100  
jeb@pumpsystemsinc.com

### System Overview:

DES mandated a second source of water for a water system proven to average 8000-9000gpd, due to system expansion by 17 units.

There are 82 existing connections, averaging approximately 8000-9000gpd, and 17 proposed connections, plus the ski area, now defunct, which has been disconnected from system. All existing connections and all proposed connections are residential.

Existing pump operates at 450gpm for 24 hours, based on meter readings when system was running manually. Average water use currently 8000-9000gpd. Pump runs about 3 hours every other week, no way to chart daily use. Even when ski area was in operation, average usage has remained stable. This is primarily a second home community with approximately 75% of the units vacant in most cases. In summer more owners use units for the whole week, while in winter, more owners use their unit, but primarily only weekends, which balances usage seasonally. These are two storage tanks capable of holding 250,000 gallons each. Due to low usage, DES requested that one tank be used. Currently only one 250,000 tank is in use. The tanks are approximately ½ mile from the well and source meter. In the event the ski area resumes operation, water usage is restricted to usage for toilets and (potential) restaurant/bar. The ski area has a separate snow making pond for snow making use, and the TVCA II well will not be used for snow making at any time.

**Oversight of Plan:** Activities outlined in the water conservation plans will be completed under supervision of a certified water system operator. Currently, Pump Systems, Inc. provides operation services to the water system.

**Source Meter Management:** A 1985 Master Meter 4" MMT meter is at the source well, BRW 1. This meter is proposed to be replaced with a 4" AMCO T4000 Class II turbine meter, accurate to 98.5%-101.5%. The new meter will be tested annually for accuracy and test results included with the three year ongoing compliance report.

The name of proposed well #2 is currently unknown. A source meter will be installed on the proposed well. Source meters will be calibrated yearly or per manufacturer's recommendations. If the manufacturer's recommendation is to be relied on, the supporting recommendation documentation will be submitted with the three year ongoing compliance report. Source meters will be selected, installed, and maintained in compliance with "Manual of Water Supply Practices M6, Water Meters-Selection, Installation, Testing, and Maintenance." (American Water Works Association. 1999).

**Source Meters:** Source meters will be read weekly and logged. Weekly readings were required for 12 months per a Letter of Deficiency DES issued. Once requirement of LOD is fulfilled, the meter readings will still be read weekly at both the existing and proposed well.

**Service Meter:** The water system is choosing to continue to provide comprehensive leak detection surveys, according to DES guidelines, instead of installing service meters.

**Unaccounted Water:** The water system is choosing to continue to provide comprehensive leak detection surveys, according to DES guidelines, instead of installing service meters.

**Water Audit:** The water system is choosing to continue to provide comprehensive leak detection surveys, according to DES guidelines, instead of installing service meters.

**Leak Detection:** Night time flow analysis in conjunction with acoustic leak detection will be used to identify and locate leaks. Metallic piping is used up to the unit shut offs and then plastic from the shut off into the unit, but approximately 25% of the system is buried at least 16' deep which could make acoustic leak detection difficult; therefore, analyzing flows during low use hours and isolating potential leaks through valving, will help narrow the location of the leak down prior to use of acoustic leak detection equipment.

A pipe location survey will be done in order to perform leak detection, if existing plans are insufficient in identifying location of pipes.

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Night time flow analysis will be conducted once a year.

- a) We will install a temporary flow meter in the upper PRV chamber to identify/target which branch/branches of the system the leak(s) might be located on (refer to Step H below for methodology). We will direct our acoustic surveyor to start the survey on the branch/branches where leak(s) are suspected and move outward in a stepwise fashion to identify leaks.
- b) Within 60 days of leak discovery, leaks will be repaired.
- c) Within a week after leak repair, water usage will be recorded every minute for one hour between 1am and 3am using an Elster C700 Positive Displacement Meter which will be installed on a bypass line. (Nighttime usage will be recorded prior to sprinkler season if possible.)
- d) Nighttime flow data will be used to establish a threshold for the triggering of additional leak detection. Nighttime flow data, the proposed threshold, and reasoning behind establishment of proposed threshold will be submitted to DES for review.
- e) Once a year and within 7 days of the date which water usage was recorded to establish the threshold, water usage will be recorded every minute for one hour between 1am and 3am.
- f) If flows are above the threshold, then flows will continue to be recorded for an additional hour.
- g) If flows are still above the threshold, the previous step will be repeated again in 7 days.
- h) If again flows are above the threshold, then further steps will be taken to identify potential leakage. As feasible, we will close valves to isolate select portions of the system and evaluate the change in flow as measured by the bypass meter. One person in the field (operating the valves) will then communicate with a second person observing the leak detection meter to monitor for a change in the background flow. Assuming we isolate the leak to a certain branch of the system, we will then work to further isolate the potential leak by closing additional valves, if available.
- i) No later than two weeks from detecting potential leakage from nighttime meter readings and upon narrowing down the location of the leak to the best of our abilities, we will then have a sub-contractor accompany us with an acoustic listening device.
- j) Leak detection will be conducted in accordance with "Manual of Water Supply Practices M36, Water Audits and Loss Control Programs" (American Water Works Association, 2009).
- k) Leaks will be repaired within 60 days of discovery unless a waiver is obtained in accordance with Env-Wq 2101.09.

## 2. Leak Detection Meter

- a) An Elster C700 Positive Displacement Meter will be installed at the PRV manhole bypass line to detect leakage.
- b) We will coordinate with our water system operator to test this meter annually (e.g., the meter will be removed and a “bench” test performed using a range of flows recommended by the manufacturer). The data will be provided recorded on the attached worksheet and will be provided to NHDES with the three year ongoing compliance report. If we see “drift” in the meter readings in excess of the manufacturer’s guidelines, we will coordinate with the manufacturer to re-calibrate/replace the meter as necessary.
- c) Zone meters will be considered in future system upgrades.
- d) The distribution meter will be selected, installed, and maintained in compliance with “Manual of Water Supply Practices M6, Water Meters- Selection, Installation, Testing, and Maintenance,” (American Water Works Association, 1999).

All water shut offs, hydrants, pump stations, and valves will be visually inspected for water loss, and marked yearly. In addition, all leaks are repaired by NH licensed water operators. Leak detection will be conducted in accordance with “Manual of Water Supply Practices M36, Water Audits and Loss Control Programs” (AWWA, 2009). Leaks will be repaired within 60 days of discovery unless a waiver is obtained in accordance with Env-Wq 2101.09.

**Pressure Management:** System currently has two PRV valves installed, to keep distribution pressures below 80psi for all connections within the distribution system. The maximum pressure of the system is approximately 80 psi and minimum is approximately 60 psi. The pressure is monitored at the well source, BRW 1

**Individual Water Loss:** Many water lines are buried in excess of 16 feet, little issue of freezing. All hydrants are flushed yearly. Pressure switch shuts off well pump, before overflow of tank. Due to low usage, only 1 of 2 250,000 storage tanks is used. Currently, there are no plans to use tank #2 at this time, if it is used it will be tied to tank #1 pressure switch.

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**Consumption Side Management:** Association pays for water use as a budgeted line item on a bulk basis, no individual bills are utilized. Irrigation is not allowed at Tenney Village Condominium Association without permission.

**Educational Outreach:** The Association will scan and email NHDES fact sheets WD-DWGB-26-2, and WD-DWGB-26-3 to all users, including ski area, if it ever reopens. These and other documents, as they relate will be disseminated via email yearly, and at the Annual Meeting.

**Compliance Reporting:** The water system will submit a form supplied by DES once every 3 years documenting compliance with Env-Wq 2101.

**Notification:** Within seven (7) days of submitting the water conservation plan to DES, the Association shall provide a copy of the water conservation plan will be sent, via certified mail to the Town of Plymouth and the North Country Council. The entities may provide DES comments within 21 days of receipt of the plan. All signed copies of the Certified Mail Return Receipts (the green cards) will be forwarded to DES.

The governing boards of Plymouth will also be provided with a summary of the requirements of Env – Wq 2101 and be requested to amend local site planning requirements to reflect the requirements of Env – Wq 2101 or to promote water efficiency.

**Bylaws:** The Association controls all exterior landscaping, and will be requested to promote the use of drought resistant plants and grasses. Irrigation systems are currently not allowed. The Board of Directors meets a minimum of 6 times per year to discuss potential water savings.

**Use Restrictions:** The Association retains the right to shut off owners who do not comply with water usage recommendations. At the current time, due to extremely low usage, water restrictions have not been necessary.

**Overview:** The Tenney Mountain Association takes the safety of its water supply very seriously, and has and will continue to comply with proper water use and conservation, as directly by the NHDES, as well as regional and Federal Authorities.

I certify that I have read this Water Conservation Plan, understand the responsibilities of the water system as referenced in the plan, and that all information provided is complete, accurate, and not misleading.

System Owner Name (print): Mark Boezynski For Tenney

System Owner Signature:  Date: 6/19/12

Tenney Mountain  
Association