

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

February 21, 2014

James Ingram
Maranatha Construction
38 Baily Road
Chichester, NH 03258

RE: Thornton – Millsbrook Village Water System (PWS ID #: 2342110)
Water Conservation Plan, NHDES # 999859

Dear Mr. Ingram:

On February 14, 2014, the New Hampshire Department of Environmental Services (“DES”) Drinking Water and Groundwater Bureau received a Water Conservation Plan (the “Plan”), dated February 12, 2014, for the Millsbrook Village water system located in Thornton, New Hampshire. 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 and specifically the requirements for existing small community water systems.

Pursuant to Env-Wq 2101.25, the Town of Thornton and the North Country Regional Planning Commission were provided a copy of the plan.

This approval is conditioned upon the following:

1. A source meter shall be installed on the new well prior to the source activation date or if already activated under an emergency authorization, within 30 days of receiving this approval.
2. By **May 1, 2014**, all source meters and distribution meters shall be tested and calibrated or replaced. Also, by May 1, 2014, testing results and calibration confirmation shall be sent to DES.
3. Meters shall be tested and calibrated every 4 years from the previous test.
4. The distribution of water efficiency materials biannually to residents shall begin no later than one year from final source approval.
5. Biannual night flow analysis shall begin no later than one year from final source approval.
6. On **February 21, 2017**, and every three years thereafter, the water system shall submit a detailed and completed compliance report form to DES documenting compliance with the Plan.
7. Records described in VI.A. of the Plan shall be submitted with the three year compliance report.
8. Upon receiving a WUID and further instructions from DES, Millsbrook Village shall report to the DES Water Use Registration and Reporting Program. Total monthly volume withdrawn from

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

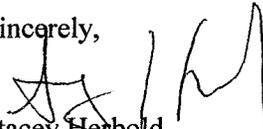
each source shall be reported to DES on a quarterly basis. The first quarter report is due **July 31, 2014**.

9. Revisions to the Plan shall not be implemented without further approval from DES.

A copy of the *Water Conservation Plan Ongoing Compliance Form* may be located by going to the DES website, www.des.nh.gov, clicking on the "A-Z List" in the top right corner of the page, and scrolling down to Water Conservation.

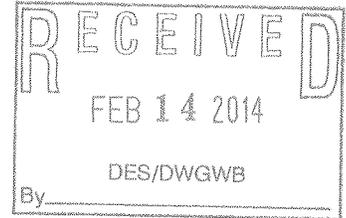
Please feel free to contact me with any questions at (603) 271-0659 or via e-mail at stacey.herbold@des.nh.gov.

Sincerely,



Stacey Herbold
Water Conservation Program
Drinking Water and Groundwater Bureau

ec: Diana Morgan, NHDES
Bethann McCarthy
Derek Bennett, NHDES (LD)
Town of Thornton
North Country Regional Planning Commission



Millsbrook Water Conservation Plan

PROJECT NAME Millsbrook Village

TOWN/CITY Thornton

PWS ID 2342110

CONSERVATION PLAN OUTLINE

I. Introduction

A. Contact Information

Name James Ingram

Address 38 Bailey Road, Chichester NH 03258

Company Maranatha Construction

Phone Number 603-236-6373

License/Certification Type & Number Water system operator Grade 1A w/ treatment #1064

B. Name and location of system.

Mills Brook Village Water System

Falls Rd, Thornton NH

C. Owner of system and mailing address.

Name James Ingram

Address 38 Bailey Road, Chichester NH 03258

Company Maranatha Construction

Phone Number 603-236-6373

Email jim.r.ingram@gmail.com

D. Name and mailing address of designer of the water conservation plan.

Name James Ingram

Address 38 Bailey Road, Chichester NH 03258

Company Maranatha Construction

Phone Number 603-236-6373

Email jim.r.ingram@gmail.com

E. System Overview

1. Reason for new source.

Loss of production of existing BRW 2342110-001

2. Number of connections existing and proposed for each of the following classes:

a) Residential; Currently 37 and eventually will be 64

b) Industrial/commercial/institutional; None

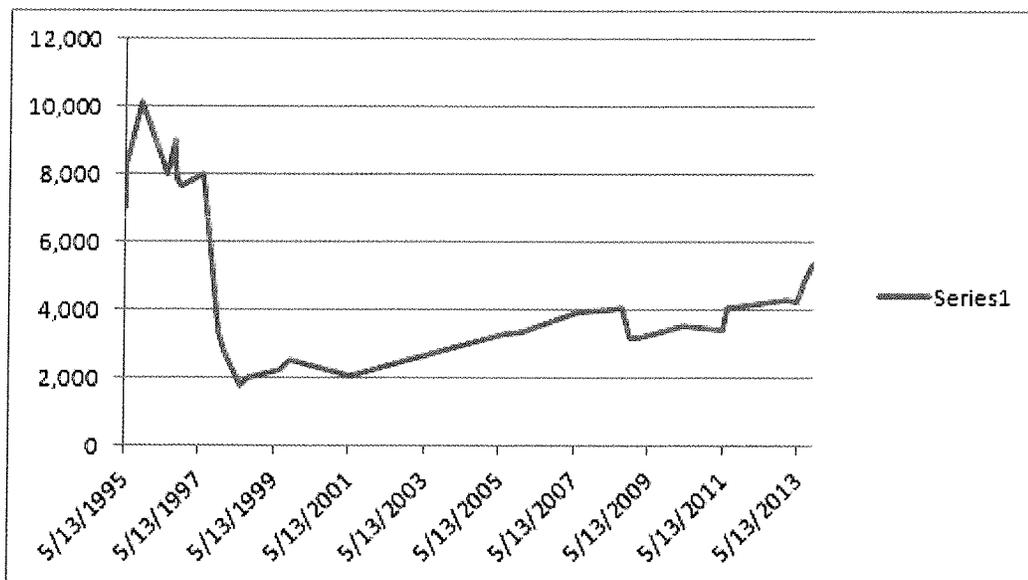
c) Municipal. None

3. Description of any connections that currently receive or will receive more than 20,000 gpd. None

F. Water Use Trends and Supporting Data / Population Trends

Total Gal Pumped	From Date	To Date	Useage in Gal / Day			
24,700	05/10/95	05/13/95	8,233			
7,300	05/13/95	05/14/95	7,300			
34,500	05/14/95	05/18/95	8,625			
7,000	05/18/95	05/19/95	7,000			
24,900	05/19/95	05/22/95	8,300			
118,200	05/22/95	06/05/95	8,443			
1,344,200	06/05/95	10/16/95	10,107			
2,154,600	10/16/95	07/10/96	8,040			
567,700	07/10/96	09/11/96	9,011			
100,900	09/11/96	09/23/96	8,408			
133,200	09/23/96	10/10/96	7,835			
214,700	10/10/96	11/07/96	7,668			
1,739,900	11/07/96	06/12/97	8,018			
533,900	06/12/97	11/18/97	3,358			
179,000	11/18/97	01/21/98	2,797			
282,400	01/21/98	06/30/98	1,765			
119,300	06/30/98	08/29/98	1,988			
722,100	08/29/98	07/20/99	2,222			
215,300	07/20/99	10/13/99	2,533			
1,204,200	10/13/99	05/22/01	2,051			
4,982,900	05/22/01	06/27/05	3,329			
642,700	06/27/05	01/05/06	3,347			
2,144,500	01/05/06	07/03/07	3,942	25	houses using water as of 7/3/07	157.6 8 GPD/unit
1,033,540	07/03/07	03/18/08	3,991	25	houses using water as of 3/18/08	159.6 2 GPD/unit
679,480	03/18/08	09/02/08	4,045	27	houses using water as of 9/2/08	149.8 0 GPD/unit
250,680	09/02/08	11/20/08	3,173	27	houses using water as of 11/20/08	117.5 2 GPD/unit
217,290	11/20/08	01/27/09	3,195	27	houses using water as of 1/29/09	118.3 5 GPD/unit
1,608,600	01/27/09	04/26/10	3,543	27	houses using water as of 4/26/10	131.2 3 GPD/unit
1,327,080	04/26/10	05/16/11	3,447	30	houses using water as of 5/11/11	114.9 0 GPD/unit
122,300	05/16/11	06/15/11	4,077	34	houses using water as of 6/15/11	119.9 0 GPD/unit
2,556,680	06/15/11	01/26/13	4,326	36	houses using water as of	120.1 GPD/unit

					1/26/13	7	
397,000	01/26/13	04/30/13	4,223	36	houses using water as of	117.3	
					4/24/13	2	GPD/unit
405,320	04/30/13	07/22/13	4,883	36	houses using water as of	135.6	
					7/22/13	5	GPD/unit
448,640	07/22/13	10/14/13	5,341	36	houses using water as of	148.3	
					10/14/13	6	GPD/unit
99,590	10/14/13	11/06/13	4,330	36	houses using water as of	120.2	
					10/14/14	8	GPD/unit



The water system was developed in 1988. The first house was occupied in 1989 or so. As you can see from my water use records, I didn't start logging use data until May of 1995 when I became quite sure there was a substantial leak in the system.

The first 6 readings on the chart vary as they were very short (a day or two) readings. A couple hours difference in the time of day read accounts for the variation.

A 5.5 GPM leak was found and repaired in July of 97 and clearly shows on your graph. Water readings moved in line with the number of connections at this point.

By the late 1990's there were approximately 15 houses built. The building boom from 2000 - 2006 saw roughly 10 houses added. That brings us up to 25. My water use records start recording the number of connections at this point. In 2008 2 more houses were added making a total of 27. In 2008 and 2009 I built a 9 unit condo building during the recession to keep my crew working. It became clear that the units were not saleable in the present economy. Therefore we finished the exterior of the building by the end of 2008, and three model units by 2010. That brings us up to 30 connections. By 2011 it became clear that it would be a long time before these units could be sold at a figure that could recoup the building costs. The choice was made to rent the 9 condo units. By the end of 2012 all but one of the condos were rented. That brings us to the 36 connections.

I think that the graph accurately represents the description above. It should be increasing as shown due to the 9 condo units. Another graph showing GPD/Unit would more accurately support no leaks since our last complete audit that certified that the system was leak free. Also see statements in sections B2 and C6.

We also did multiple large blow-offs this summer as our failing well (unknown at the time) was

introducing a fair amount of sand into the system.

The spike at the end of your graph will disappear if you enter the water use from 1/14/13 - 11/6/13 which was 99560 Gallons or 4330GPD.

1. Existing, if applicable, and anticipated seasonal fluctuation in water use and reason for fluctuation. Varies little as most connections are full-time residents. There are no irrigation systems.

2. Anticipated growth in population and seasonal fluctuations in population. System now serves 37 connections. Will serve 64 at build out.

3. Maximum day yield of existing sources based on 24-hour pumping.
2342110-003 10 GPM

4. Average daily water use.
132.54 GPD x 37 connections = 4904 GPD

5. Maximum daily water use.
7000 GPD

6. Minimum hourly flows (if available).
On Thursday December 12, 2013 a night flow audit was conducted between 3:30 and 4:30AM. The meter on the 4" distribution meter recorded a 23 minute period recording zero usage during this time period.
The meter on the 2" distribution meter recorded a 20 gallon usage during this time period 60 minute period or .33 GPM average flow.

G. Source Meters

1. Name designation of each water source.

BRW 1 2342110-001
Dug well 2342110-003

2. Meter make, model, size, flow range, and date of last calibration for each existing source meter.

BRW 1 2342110-001:
Make: Rockwell
Model: SR
Size: 2"
Serial number: 42371282. Back up with source flow of 10GPM.
Install/Last Calibration: 1988

Dug well 2342110-003:
Make: Amco
Model: Scancoder
Size: 1"
Install/Last Calibration: 2008

2a. Meter make, model, size, flow range, and date of last calibration for each existing Distribution Entry Point (DEP) meter.

Distribution Meter Description: 2" Water Main exiting pump house (serves Mill Brook Village lots 12, 13, 14, 15, 16 and 19 for a total of 6 connections):
Make: Neptune

Model: T-10
Size: 3/4"
Serial Number: SN 47335677
Install date/Last Test Date: mid 90's??.

Distribution Meter Description: 4" Water Main exiting pump house (serves Mill Brook Village lots 1-11, 17, 18 and 21-38; Falls at Mill Brook Condominium units 1-18; and Brookside Hollow units 1-8; for a total of 58 connections):

Make: Rockwell
Model: SR
Size: 2"
Serial Number: 42893096.
Install Date/Last Test Date: mid 90's?

3. Meter make, model, size, and flow range for each new water source (if known).

Proposed BRW

Make: Sensus
Model: Omni T2
Size: 2"

4. Frequency that source and distribution meters will be tested/calibrated.

All of the existing meters are due for testing and calibration or replacement. The meters will be tested and calibrated or replaced within 4 months of approval of this plan. All meters will be tested/calibrated every 4 years thereafter.

Documentation of meter testing results or new meter purchase will be kept on file for at least three years.

5. Frequency that source meters will be read.

Every 30 days – once every calendar month and between 27 and 33 days from the last reading.

6. 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 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)

II. System Side Management

A. Night Flow Leak Detection Methodology

1. Distribution Meter

a. A meter capable of measuring low flows (no less than 2 gpm) will be installed on the two distribution lines and located after treatment and storage.

1. Currently there is a 2" Rockwell SR and 3/4" Neptune T-10 on the two distribution lines. The Rockwell SR meter is capable of reading flows down to 2 gpm with 90-101% accuracy and the Neptune is capable of reading flows down to 1/4 gallon at 95% accuracy.

b. 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).

2. Determining Baseline Flow

On Thursday December 12, 2013 a night flow audit was conducted between 3:30 and 4:30AM. The meter on the 4" distribution meter recorded a 23 minute period recording zero usage during this time period.

The meter on the 2" distribution meter recorded a 20 gallon usage during this time period 60 minute period or .33 GPM average flow. While this meter did not ever completely stop during this one hour interval, I have been in the pump house many times during the day when it has read zero for many minutes at a time.

Baseline flow for each distribution leg will be 0 GPM.

3. Night Flow Methodology

- a. Night flow analysis will be conducted twice a year 6 months apart (no less than 173 or more than 187 days apart).
- b. Water usage will be recorded every minute for one hour between 1 am and 3 am (unless another time of day when there is little water use is established) using the distribution meters. Users of the system will be requested prior to the night flow analysis to refrain from using water between 1 am and 3 am. If flows are above the baseline, then flows will continue to be recorded for an additional hour. If low flows are equal to or more than 3 gpm above the baseline, an emergency leak will be suspected and Steps f. – i. will be taken.
- c. If flows are above baseline but less than 3 gpm, all residents will be asked to check their homes for leaks including running toilets. The previous steps will then be repeated again in 3 days. If again flows are above the threshold, a leak on the service side of the system will be assumed and Steps f.-i. will be taken.
- d. 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.
- e. 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.
- f. 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).
- g. Leaks will be repaired within 60 days of discovery unless a waiver is obtained in accordance with Env-Wq 2101.09.

B. Leak Detection History

1. Year(s) conducted.
1998. Found 5.5GPM leak.
2. Number of leaks found.
2008. No leaks found

3. Estimated losses recovered.

1998. 7920 GDP.

4. Percent of system surveyed.

1998. 70%.

2008. 100%. Done by Jack Shields from GSRWA with ground mics.

C. Distribution System Information

1. Are pipe locations known?

Yes.

2. Breakdown of pipe material, age, and length.

4" SDR 21 water main 3829' Installed in 1988

2" SDR 21 water main 2931' Installed in 1988

3. Availability of contact points and adequacy of spacing.

Shutoffs at each lot 200' +/- apart plus sectional isolation valves.

4. Is pipe material non-metallic? If yes, as leaks are difficult to acoustically detect in non-metallic systems, what additional measures will be taken to detect leaks?

Yes

5. Will future leak detection surveys be conducted in-house or contracted out?

Contracted out. In the past we have worked in conjunction with GSRWA and plan to continue this working relationship.

6. 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).

7. Leaks found in a leak detection survey will be repaired within 60 days of discovery unless a waiver is obtained in accordance with Env-Wq 2101.09.

D. Pressure Management

1. Existing minimum distribution pressure (anticipated pressure for new landlord owned systems). 30 PSI

2. Existing maximum distribution pressure (anticipated for new landlord owned systems). 100 PSI

3. How is pressure currently monitored and how will pressure continue to be monitored? Pressure reducing valves are installed in homes where service pressure exceeds 60 PSI

4. What method will be used to reduce pressures in zones found to be in excess of 80 psi? Pressure reducing valves are installed in homes where service pressure exceeds 60 PSI

5. What will be the timeframe for reduction (at least within 1 year of source water approval)? Pressure reducing valves are already installed in homes where service pressure exceeds 60 PSI

E. Intentional Water Loss

1. Are there “bleeders” used within the system at dead ends to improve water quality or prevent freeze-up? If yes, what looping opportunities exist? No bleeders

2. Are storage tanks intentionally allowed to overflow because of system hydraulics or water quality concerns? If yes, what opportunities exist for the installation of altitude valves or tank mixing systems? No bleeders or intentional storage tank overflow

III. Consumption Side Management

A. Educational Outreach Initiative

1. Water Efficiency Informational materials that will be used.

DES water efficiency fact sheets found at:

<http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm#efficiency>,

WaterSense information including a good toilet fact sheet found at: (See the Saving water tab)

http://www.epa.gov/watersense/our_water/learn_more.html

2. Rate of dissemination.

Twice per year, once at the time of water service billing and one other time with the CCR report.

3. Does the water system intend on becoming a WaterSense partner?

<http://www.epa.gov/watersense/>

Possibly

4. Will a rebate program be offered to replace older fixtures with WaterSense certified fixtures?

No. Our worst case scenario is some 3.5 GPM toilets.

V. Water Use Restrictions

A. What is the water system’s plan relative to implementing water restrictions?

An annual reminder that the water system is not designed for watering lawns and that doing so may create water shortages.

B. Who is responsible for enforcing restrictions?

Water system owner and or board of representatives.

VI. Maintaining Records, Reporting, and Implementation

A. The following information will be maintained:

1. Records of meter purchase and testing and calibration for at least the past three years.

2. Night flow analysis records including date and readings.

3. A leak log including the date a leak is discovered, the type of leak (ex. main line, valve, service, running toilet), the closest address to the leak, the size of the leak (gpm), and the date the leak was repaired.

4. Records of the water efficiency materials issued to residents including the title and date of the material.

B. Reporting

1. The water system will submit a form supplied by DES once every three years documenting how compliance with the requirements of Env-Wq 2101 is being achieved. The report will include the information maintained in VI.A. above.

2. The water system will report monthly production volumes to the DES Water Use Registration and Reporting Program on a quarterly basis upon receiving a Water Use ID number from DES.

C. Implementation of the Plan

1. Activities outlined in the water conservation plan will be completed by water system personnel under the supervision of a certified water system operator.

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.

Owner Name (print): James Ingram

Owner Signature: _____



Date: 2/12/14