The State of New Hampshire
Department of Environmental Services
Thomas S. Burack, Commissioner

Celebrating 25 Years of Protecting
New Hampshire's Environment

AMENDED
WATER CONSERVATION PLAN APPROVAL

September 10, 2012

Heiner Luxem
Stagecoach Farms Homeowners Association
93 Ross Rd.
Durham, NH 03824

Subject: **Durham, Stagecoach Farms (PWS ID: 0692020)**
Amended Water Conservation Plan, August 2012, NHDES #996151

Dear Mr. Luxem:

On March 22, 2006, the Department of Environmental Services ("DES") Drinking Water and Groundwater Bureau approved a Water Conservation Plan for Stagecoach Farms Homeowners Association. On August 31, 2012, DES received an Amended Water Conservation Plan for the system. The purpose of this letter is to approve the Amended Water Conservation Plan (the "Amended WCP") dated August 2012, per the following conditions:

1. By **October 15, 2012,** the system shall submit the results of the nighttime flow analysis, along with proposed leak detection threshold, and reasoning behind proposed threshold. The nighttime flow analysis shall be conducted twice to determine the threshold. The first analysis will be to determine the amount of leakage in the system, if any, and the second to determine the baseline flow after pinpointing leaks through valving, and if necessary using acoustic equipment, and repairing leaks.

2. Nighttime flow analysis will be conducted yearly and results retained and submitted to DES with the ongoing three year compliance reports.

3. Ongoing three year compliance reports shall be submitted every three years from the date of the original Water Conservation Plan Approval, March 22, 2006. The next compliance report is due on **March 22, 2015**.

4. Revisions to the Amended WCP shall not be implemented without further approval from DES.

A copy of the Amended WCP and 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
Drinking Water and Groundwater Bureau

cc: Kris Kofer, Primary Operator

Herbold, Stacey P

From: Heiner SFHA [heiner.stagecoach.farms@gmail.com]
Sent: Thursday, October 04, 2012 11:02 PM
To: Herbold, Stacey P
Cc: 'Chris Kofer'; 'PT Vasudevan'
Subject: Amended Water Conservation Plan Approval
Follow Up Flag: Follow up
Flag Status: Flagged

Dear Stacey,

We did install the distribution meter according to the amended water conservation plan and starting 9/27 the meter is measuring all water going out the pump house. We also connected a data logger to the system and are now capable of logging the usage data. The meter will send a pulse for every gallon of water flowing through the meter, the data logger counts the number of pulses for a minute and logs this number with a time stamp. The data logger was tested the night of 9/28 and the number of pulses (gallons) was the same as the difference in the meter readings between start and stop of the test. See attached pictures for meter and data logger.
We propose a leak detection treshhold for the distribution system of 2 g/min. Research available on the internet shows that you can expect up to 10 % of the maximum flow rate as leaks caused from leaking toilets, irrigation systems and faucets. Our maximum flow rate is 30 g/min. Just one leaky toilet can range from 1/8 to 5 g/min leak. With 52 homes I assume there will be ~ 180 toilets, and some will be leaky.
2 g/min amounts to less than a tablespoon for each house and seems to be insignificant and not traceable.
I also spoke to the Granite State Rural Water Association and to EJP Meter and Backflow services in Concord. They state that there will be an expected amount of leakage caused by leaks in the connected houses and 2g/min is actually a small number. Leaks that small are almost impossible to detect with common leak detection methods in a water distribution system.
We did do an initial night flow analysis from Sunday 9/29 night to Monday 10/1. This test showed that the minimum flow is well under the expected threshold. Please see below chart or the tab 10-1 in the attached Excel file. The blue graph shows the pulses/gallons counted from the data logger on the y axis over time (x axis). The red line averages the water usage over 5 minutes, the lowest flow value over 5 minutes is .4 g/min. With the flow rates as low as they are it is safe to assume that there is no leak in the distribution system and we did continue the night flow analysis as described in the amended water conservation plan.
The second night flow analysis was done on 10/3, the results are similar. The chart for that day is below and shown in tab 10-3 in the attached excel file.

Going forward we will conduct the night flow analysis yearly and submitt the result with the ongoing three year compliance report. With the installation of the meter and the data logger we are able to log and monitor the water usage continuously.

Please let me know if you have any question regarding the data for the night flow analysis.

Best regards,

Heiner Luxem
Stagecoach Farms

Amended Water Conservation Plan

Stagecoach Farms

Durham, NH

August 2012

I. Introduction

A. Contact Information

1. Name and location of system:

Stagecoach Farms, Durham (Pump House = off of Ross Road)

2. Owner of system and mailing address:

Stagecoach Farms Homeowners Association

c/o Heiner Luxem

PO Box 160

Durham, NH

3. Name of Primary Operator:

Chris Kofer

Aqua Specialties LLC

561 First NH Turnpike

Northwood, NH 03261

ckkofer@aqua-specialties.com

(603) 942-5671

B. System Overview

1. Reason for new source. **New backup wells BRW #1 and #4.**

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

a) **Residential; 55**

C. Water Use Trends and Supporting Data / Population Trends

1. Maximum day yield of existing sources based on 24-hour pumping. **#5 = 37.5 gallons/minute, #1= 8 gallons/minute, #4 = 8 gallons/minute**

2. Average daily water use. **Approx 9,000**

3. Maximum daily water use. **Approx 15,000 summer**

D. Source Meters and Distribution Meter

1. Name designation of each water source.

a) BRW #1: ¾" Master Meter, installed in around 2006

b) BRW #4: 5/8" Master Meter, installed in around 2006

c) Well #5: 1.5"ABB meter Model C700

(1) Installation date unknown

(2) Tested on 3/2/1012- Low:84% Med 97% High 95%

2. Source meters will be tested/calibrated every 4 years.

3. **Source meters and the distribution meter will be read every 30 days.**

4. **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).**

E. Leak Detection

1. **Leak detection will be conducted using a distribution meter and conducting night flow analysis yearly. Baseline flows will be determined and leaks identified and located in accordance with the attached methodology (Appendix A.)**

2. **The distribution meter will be a 2" Sensus Omni T2 meter.**

3. **The accuracy warrantee on the distribution meter is 20 years. Upon the expiration of the accuracy warranty the distribution meter will be tested/calibrated. The distribution meter will continue to be tested every 4 years.**

4. Summary of findings for the most recent leak detection surveys including the following information:

a) Year(s) conducted. **Acoustic leak detection survey conducted** on **Nov 23, 2009**

b) Number of leaks found. **None**

5. Are pipe locations known? If not, include a statement that a pipe location survey will be conducted in order to perform leak detection. **Yes**

6. Breakdown of pipe material, age, and length. **PVC mains and poly service**

7. Availability of contact points and adequacy of spacing. **Gate valves.**

8. **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).**

9. **Leaks will be repaired within 60 days of discovery unless a waiver is obtained in accordance with Env-Wq 2101.09.**

F. Pressure Management

1. Existing minimum distribution pressure (anticipated pressure for new landlord owned systems). **45**

2. Existing maximum distribution pressure (anticipated for new landlord owned systems). **70**

3. How is pressure currently monitored and how will pressure continue to be monitored? **Pump house gauge**

4. What method will be used to reduce pressures in zones found to be in excess of 80 psi? **Pressure reduction not feasible as development is on flat terrain with elevation change of 50 ft max and pressures are fairly low any way.**

G. 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? **Flush system 1/yr.**

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. Automatic shut-off on tanks.**

II. Consumption Side Management

A. Educational Outreach Initiative

1. Informational materials that will be used. **Water efficiency materials will be distributed to residents with the association dues yearly.**

DES Water Efficiency Materials:

http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm

WaterSense Materials:

http://www.epa.gov/watersense/our_water/learn_more.html#tabs-2 (See "Saving Water" tab.)

2. **Rate of dissemination. Yearly.**

III. Water Use Restrictions

A. What is the water system's plan relative to implementing water restrictions? **Same as what is in emergency plan. Operator will send out stop irrigation notice.**

IV. Reporting and Implementation

1. **Monthly production volumes will be reported to the DES Water Use and Registration Program on a quarterly basis.**

2. **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.**

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

8-30-12

Heiner Luxem Date

Appendix A. Leak Detection/Night flow Analysis

1. Determining Water Use Thresholds

    a. By October 15, 2012, nighttime flow analysis will be conducted as described in 3.b., below, and leaks isolated and pinpointed as described in 3.e through 3.h., below.

    b. Leaks will be repaired within 60 days.

    c. Once leaks are repaired, night time flow analysis will be conducted again as described in 3.b., below. The lowest flow will be considered the baseline.

    d. The threshold above the baseline will be determined by considering the size, age, and history of the system.

    e. The baseline flow and proposed threshold will be submitted to DES for review and approval. The submittal will also include the reasoning and evidence behind the proposed threshold.

2. Night Flow Analysis

    a. Night flow analysis will conducted yearly.

    b. Water usage will be recorded every minute for one hour between 1 am and 3 am using a distribution meter. Users of the system will be requested prior to the night flow analysis to refrain from using water between 1 am and 3 am on this date. Nighttime flow analysis will be conducted prior to or post sprinkler season if possible.

c. If flows are above the threshold, then flows will continue to be recorded for an additional hour.

d. If flows are still above the threshold, the previous step will be repeated again in 7 days.

e. If again flows are above the threshold, a leak will be assumed. 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.

f. 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.

g. 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).

h. Leaks will be repaired within 60 days of discovery unless a waiver is obtained in accordance with Env-Wq 2101.09.

8-30-12

Heiner Luxem Date