Village District of Eastman

PO Box 990
Grantham, NH 03753-0990

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Mr. Derek S. Bennet and Mr. Timothy L. Nowack
Large Groundwater Withdrawal Program
NHDES – Drinking water and Groundwater Bureau
P.O. Box 95, 29 Hazen Drive
Concord, NH 03302-0095

RECEIVED
AUG 09 2007
DES/DWGWB
By_____

August 6, 2007

RE: Village District of Eastman – Large Ground Water Withdrawal Project
Source #5 Bog Brook Well Site, Springfield, NH
Water Conservation Plan Notification

Dear Mr. Bennet and Mr. Nowack,

Please find attached the revised Water Conservation Plan (WCP) as part of our application for a new large Groundwater Withdrawal at the Bog Brook Well Site in Springfield, NH. This revised WCP supersedes our previous WCP submitted to you in June 2007.

Copies of the letters along with certified receipts to the Towns of Grantham, Springfield and Enfield and the local Regional Planning Commission are attached.

I trust that this WCP will meet with your approval. If you have any other questions or comments please do not hesitate to call me at 863-6512 or cell at 504-4188.

Sincerely,

James J. Donison, P.E.
Manager, Village District of Eastman

Cc: Gene Schrager, GS Environmental

Env-Ws 390 Water Conservation Rules Compliance Report
July 2007

Submitted by Village District of Eastman, Grantham, NH, P.O. Box 990 03753
EPA ID # 0951010

To: NHDES, DW&GB

The purpose of this report is to document compliance of the Village District of Eastman (VDE) with the requirements of Env-Ws 390, *Water Conservation Rules.* This report is being submitted to NHDES-DWGB as a supplement to the Preliminary Large Groundwater Withdrawal Permit Application (LGWD) for Source #5 (Bog Brook Well Site in Springfield, NH). This preliminary report was prepared as part of the large community well siting requirements of Env-Ws 379 and the large groundwater withdrawal requirements of Env-Ws 388.

As prescribed in Env-Ws 390.10, it states that a water user shall submit a Water Conservation Report that demonstrates compliance with Env-Ws 390.01 through 390.08 for applications involving a new source of groundwater for a large community water system. This report shall be submitted along with the LGWD preliminary report.

VDE is an existing community water system that is in the process of permitting a new bedrock well BRW#5 for a requested source water withdrawal rate of 110 gpm.

This new LGWD is necessary as the current two permitted Village District of Eastman (VDE) wells have a permitted capacity of 257,280 gpd based upon operating the wells 16 hour per day (Source #1 Dug Well at 110 gpm and Source 6 Gravel Packed well #4R at 158 gpm).

The VDE buildout scenario water demands project a increase in number of units from 1310 units (2007) to 1550 units (at buildout). This represents a peak day water demand of 434,000 to 496,000 gpd based upon 280 gpd/unit to 320 gpd/unit; a maximum monthly average day water demand of 279,000 to 310,000 gpd based upon 180 gpd/unit to 200 gpd/unit; and an average day water demand of 232,500 to 263,500 gpd based upon 150 gpd/unit to 170 gpd/unit.

There are not any consecutive water systems connected to the VDE water system. NHDES rules require that the average day demands be satisfied with the largest source out of service and that the peak day demand must be satisfied from all sources.

Therefore if the largest source #6 (Well #4R) is out of service, then the remaining source #1 (Dug Well) at 110 gpm (105,000 gpd pumping at 16 hrs per day) does not have sufficient capacity/yield to supply the VDE demand buildout of 263,500 gpd (ADF at 170 gpd/unit)

It is critical to the water needs of VDE that the proposed source #5, as part of the LGWD application, be available.

Env-Ws 390.05(b) through (f) Water Meters

390.05 (b) VDE has already installed water meters as prescribed in Env-Ws 390.05(b) on all sources of water and water users.

All water services to residential customers and to the Eastman Community Association (ECA) offices are metered with ¾" diameter meters except to the ECA Fire Station and the ECA Community Center which are 2" and 4" respectively.

The residential water meters are relatively new meters have been installed as part of a water meter replacement program in 2004 through 2007.

The VDE also has 3 source water flow meters located at the water treatment plant. These include an untreated WTP turbine meter {4" Neptune}, a WTP treated water magnetic {6"} and a WTP treated venture meter {8"}.

390.05 (c) and (d) The water meters are properly sized for their function, and the meters are selected, installed and maintained in accordance with the protocols and procedures described in the "Manual of Water Supply Practices, Water Meters – Selection, Installation, testing and Maintenance" document identification AWWA M6, American Water Works Association, 1999.

390.05 (e) The VDE bills customers on a 2 times per year basis. All water meters are read and customers billed in May and November of each year.

A waiver to rule Env 390.05 is being requested to allow this twice per year billing process to continue. Additional meter reading and billing frequency will result in unnecessary additional costs to the VDE as the VDE only has 2 field employees, one office administrator and a manager.

Staff monitors the daily water consumption on a daily basis and is aware of sudden increases in water demands which could be caused by watermain breaks and immediately investigates the situation for causes.

The VDE will continue to seek options and alternatives for increasing the frequency of reading and billings.

390.05 (f) The meters for the sources (as described above) are manually read daily/recorded and are also automatically read and recorded on a constant basis with the use of a SCADA system with information saved on a computer system.

The SCADA system (Supervisory Control and Data Acquisition) uses iFix Intelusion and maintains date through digital information communication.

Env-Ws 390.05(g) Water Audit, Leak Detection - The VDE will be implementing a water audit and leak detection program following the requirements and standards in accordance with AWWA M36, *Manual of Water Supply Practices, Water Audits and Leak Detection*, available from the American Water Works Association. This water audit will be performed on an annual basis within one year of obtaining approval for the new source.

To date the VDE has not performed a water audit or leak detection survey. However VDE will be purchasing lead detection equipment in the fall of 2007 as part of this program.

Presently the percent of unaccounted for water within the VDE water system is estimated at 16% to 34% with an average of 25%. This represents the period 2002 to 2006 where in 2002 it was 22%, in 2003 it was 33%, in 2005 it was 34% and in 2006 it was 16%. During this period there was a water ban in effect from the summer of 2004 through 2006.

Unaccounted for water means the difference between known water pumped from the well sources and that water used as measured from metered and un-metered uses (un-metered uses including system flushing and maintenance, water bleeders during winter months due to shallow buried watermain in dead-end street areas (6 bleeders), watermain and service line breaks, water treatment plant laboratory analyzers, and watermain & service line leakage, etc.)

The original water system was constructed in the early 1970 by a private developer prior to the system coming under the ownership of the VDE in 1981. The water system consists of 45,000 linear feet (8.5 miles) of 8 inch diameter asbestos cement pipe, 1,600 lf (0.3 mi) of 10" PVC pipe, 14,900 lf (2.8 mi) of 4" PVC pipe and 2,400 lf (0.5 mi) of 2" PVC pipe. The VDE is rural in nature in a heavily wooded area with Eastman Lake and many wetland areas along the main roadway network where the watermains are located. Therefore it is not obviously to find watermain leaks unless a complete watermain failure occurs as leakage into the lake or wetlands is not obvious.

Env-Ws 390.05(h) Leak Repairs

It will be the policy of VDE to repair within 60 days of discovery all leaks identified in the course of carrying out the water audit and leak detection activities. VDE understands that for any such leak, it is obliged to obtain a waiver under Env-Es 390.09 if it finds that it will be unable to repair the leak in a 60-day time-frame.

As part of the water audit and leak detection program VDE will maintain in its files records of the detections of leaks including the information on when the leak was discovered, actions taken to fix the leak and the date the leak was repaired as well as estimated flowrates of the individual leaks.

Env-Ws 390.05(i) (j) (k) and (m)- Unaccounted for Water / Response Plan

390.05 (i) VDE annually estimates the volume and percentage of unaccounted water in the water system in accordance with the "Manual of Water Supply Practices, Water Audits and Leak Detection" document identification number AWWA M36 American Water Works Association, 1999. These estimates are maintained in the VDE files.

Source water is measured from three meters located at the WTP. These include the untreated WTP turbine meter {4" Neptune}, the WTP treated water magnetic {6"} and venture meters {8"}). This source water amount is compared with the known water use based upon water consumption billings of customers and from other uses which are unmetered such as bleeders, major watermain breaks and WTP laboratory analyzers.

This water use information serves as part of the comparison of water pumped versus water used (both metered and unmetered) and is used to determine the percent unaccounted water within the water system.

<u>The following is a summary of water use and accounted water use along with the percent unaccounted for water.</u>

Year	Total Annual Gallons/yr -watermain breaks, meter changeouts, corrections) Gal/yr	Actual Billings Gal/yr	Unbilled & Accounted (bleeders, lab analyzers Gal/yr	Total Billed and unbilled	% Unaccounted
2003	70,726,000	43,310,000	11,862,000	55,171,000	22%
2004	69,929,000	36,429,000	10,715,000	47,144,000	33%
2005	69,970,000	35,600,000	10,574,000	46,160,000	34%
2006	56,438,000	36,750,000	10,768,000	47,518,000	16%
Average					25%

The above table demonstrates the success that the VDE has over this 2003 to 2006 period in reducing the total unaccounted-for water to a low of 16% in 2006.

390.05 (j) VDE acknowledges that is it obliged to prepare and submit a response plan to NHDES within 60 days if the percentage of unaccounted-for water in the system exceeds 15% of the total volume introduces to the system.

390.05 (k) If such a response plan has to be prepared, it will explain how VDE proposed to reduce unaccounted for water to below 15% within a two year period. VDE will implement such a response plan upon approval from NHDES. Regardless of the two-year schedule for reducing the percentage of unaccounted for water, VDE recognizes that it will continue to have the obligation to repair individual newly discovered leaks within 60 days of discovery.

390.05 (m) The VDE shall implement the response plan in accordance with the approved schedule upon receiving approval from NHDES.

Env-Ws 390.05(n) Pressure Reduction

Systems have a responsibility and obligation to implement pressure reduction within one-year of obtaining approval for a new community water supply, depending upon the technical feasibility, consistent with industry standards and regulations and consistency with other public health and safety considerations.

There are three (3) pressure zones within VDE. The main pressure zone originates at the Water Treatment Plant on Wellfield Road with a pressure of approximately 160 psi and water is pumped to two water storage tanks (The Hilltop and the Snow Hill tanks). Booster pumps pump water to the Anderson Pond pressure zone boosting the pressure from 15-20 psi to 70 psi serving 70 homes. Booster pumps at the Snow Hill Tank create a third pressure zone increasing pressure from 20 to 70 psi serving 100 homes.

The distribution system within VDE is "hilly" terrain which is the reason for the two additional pressure zones. Creating additional pressure zones to reduce the main WTP system pressure would result in high capital expenditures to construct additional storage tanks and booster stations and is not feasible.

It is the VDE's assessment of the current system pressure zones that they are in appropriate as presently operated as they are consistent with water system industry standards and regulations; and they are consistent with other public health and safety considerations.

The SCADA system via wireless radio signals maintains pressure records and in the event of abnormal low or high pressures the operators are "alarmed". This information includes water levels in storage tanks and the capability of starting and stopping the water well pumps based upon preset operator setpoints for desired water storage tank levels.

The VDE system has two storage tanks with a total of 300,000 gallons. The Hilltop storage tank has a capacity of 125,000 gallons and the Snow Hill Tank has a capacity of 185,000 gallons.

The minimum storage capacity standards for water systems not providing fire protection are to provide storage equal to the average daily consumption. This corresponds to a minimum acceptable storage volume of 310,000 gallons (1550 units x 200 gpd/unit). The present storage capabilities of VDE satisfy the water standards.

Env-Ws 390.05(o) Rate Structure – Env-Ws 390.05(o) requires the adoption of a rate structure that promotes water conservation within five years of approval of a new water source. VDE's existing rate structure already satisfies this requirement as the VDE water rate structure is an increasing rate.

For residential customers it is $0.60 per 100 gallons and over 60,000 gallons per semi-annual billing period it increases to $0.90 per 100 gallons. For commercial customers it

is $0.75 per 100 gallons and over 60,000 gallons per semi-annual billing period it increases to $1.00 per 100 gallons.
The SCADA system (Supervisory Control and Data Acquisition) uses iFix Intelusion and maintains date through digital information communication.

via wireless radio signals from the water storage tanks provides the capability of starting and stopping the water well pumps based upon preset operator setpoints for desired water storage tank levels.

Env-Ws 390.05(p) Educational Outreach - VDE agrees to complete a water conservation educational outreach initiative using materials prepared by NHDES.

This will include public notification and outreach to the local towns of Grantham, Springfield and Enfield as well as the Sullivan County Regional Planning Commission. This mailing would include the Env-Ws 390 requirements summary prepared by NHDES. Also included in the letters will be a request that the towns amend their site planning regulations to reflect the requirements of Env-Ws 390 where applicable, and to include language in their ordances to promote water conservation landscaping for new projects.

The VDE does not have any wholesale customers or consecutive water system that it supplies water to who would be required to receive these mailings.

VDE will implement an educational outreach initiative for the VDE customers to promote water conservation.

The VDE community dates back to 1971 when construction of homes within the district started. By 1978 the number of homes was 284. This number has steadily increased to the present 2007 number of 1310 units. The daily average water demand as determined from the water billings is approximately 70-100 gpd per residential dwelling unit. This is a very low water consumption amount and reflects the water conservation awareness that the VDE population has. The VDE has been primarily seasonal homes however this is transitioning to year round homes. The seasonal nature of home use does contribute to this low gallon per day per unit average as presented.

VDE has already taken initiatives to implement water conservation educational outreach by distributing brochures on a regular basis. VDE is committed to continue with water conservation outreach by distributing information/brochures as part of forthcoming semi-annual water bills to continue to assist with the education of water conservation efforts.

For information purposes to further explain how the VDE has already taken initiatives, the VDE water customers have been acutely made aware of the critical nature of water conservation. This has included a June 2004 VDE implementation of a water ban due to a water source supply shortage. This mandatory water ban was on outside watering (all outside hoses and/or automated sprinkler systems). Further, in June 2005, notices

were again sent to VDE water customers requesting that they implement water conservation measures consisting of odd/even number watering schedule. This policy consisted of odd numbered houses being permitted to use outside watering on odd numbered days and similarly even numbered houses being permitted to use outside water on even numbered days. Again in August 2006 the VDE sent letters to customers requiring them to continue with the implementation of the mandatory water ban due to the continuing water source supply shortage. As part of this water ban and the odd/even watering policy water conservation information brochures were also distributed to all customers.

In April 2005 the VDE adopted a water use restriction ordinance under its authority to regulate public water systems as part of RSA 38:26. This ordinance gives the VDE Board of Commissioners the authority to use reasonable means to "protect, preserve and maintain the public health, safety and welfare whenever they have determined there exists a water supply shortage". This ordinance carries with it the ability to impose civil penalties not to exceed $10,000 per day for violations.

Historically, the VDE has been primarily seasonal homes with high peak demands on holiday weekends. However this seasonal home ownership has been transitioning to full time/year round residences resulting in higher average day demands throughout the year. Educating the seasonal home owners is more difficult than year around residences. It is anticipated that with time as the seasonal to permanent nature transition occurs water conservation efforts will improve.

VDE agrees to will continue with this water conservation requirement as part of the new water source approval. Records of these water conservation educational efforts will be maintained in the VDE files.

Initially upon the new water source approval, the educational outreach material will consist of copies of water conservation fact sheets from the NHDES web site. Specific fact sheets will include the following:

- Water Efficiency Overview (WD-WSEB-26-1)
- Water Efficiency Practices for Domestic Indoor Water Use (WD-WSEB-26-2)
- Water Efficiency practices for Outdoor Use (WD-WSEB-26-3)
- Fundamentals of Xeriscaping and water-Wise Landscaping (WD-WSEB-26-4)
- Performing a Domestic Water Use and Conservation Audit (WD-WSEB-26-15)
- Water Conservation at Home (WD-WSEB-26-17).

Copies are not attached to this report as they are available on line. The fact sheets will be inserted into the water bills twice per year, using a different fact sheet in each mailing. The VDE may also supplement the NHDES fact sheets with additional educational materials from AWWA or other sources.

Env-Ws 390.05(q) Certified Operator Supervision – as required, the activities described in this report will be carried out by the system personnel under the supervision of a certified operator pursuant to Env-Ws 367.

Waiver Application

Project Name: Village District of Eastman Source #5 LGWD request

Town/City: Grantham/Springfield.Enfield, NH

Date: July 20, 2007

Which section of the rule are you requesting be waived? Env-Ws 390.04 (e). Specifically, the requirement that states:

The water system shall read the water meters at least once every 90 days.

Explain why this requirement needs to be waived. Also describe what hardship would be caused if the rule were adhered to. Provide diagrams where helpful.

The VDE bills customers on a 2 times per year basis. All water meters are read and customers billed in May and November of each year.

A waiver to rule Env 390.05 is being requested to allow this twice per year billing process to continue. Additional meter reading and billing frequency will result in unnecessary additional costs to the VDE as the VDE only has 2 field employees, one office administrator and a manager.

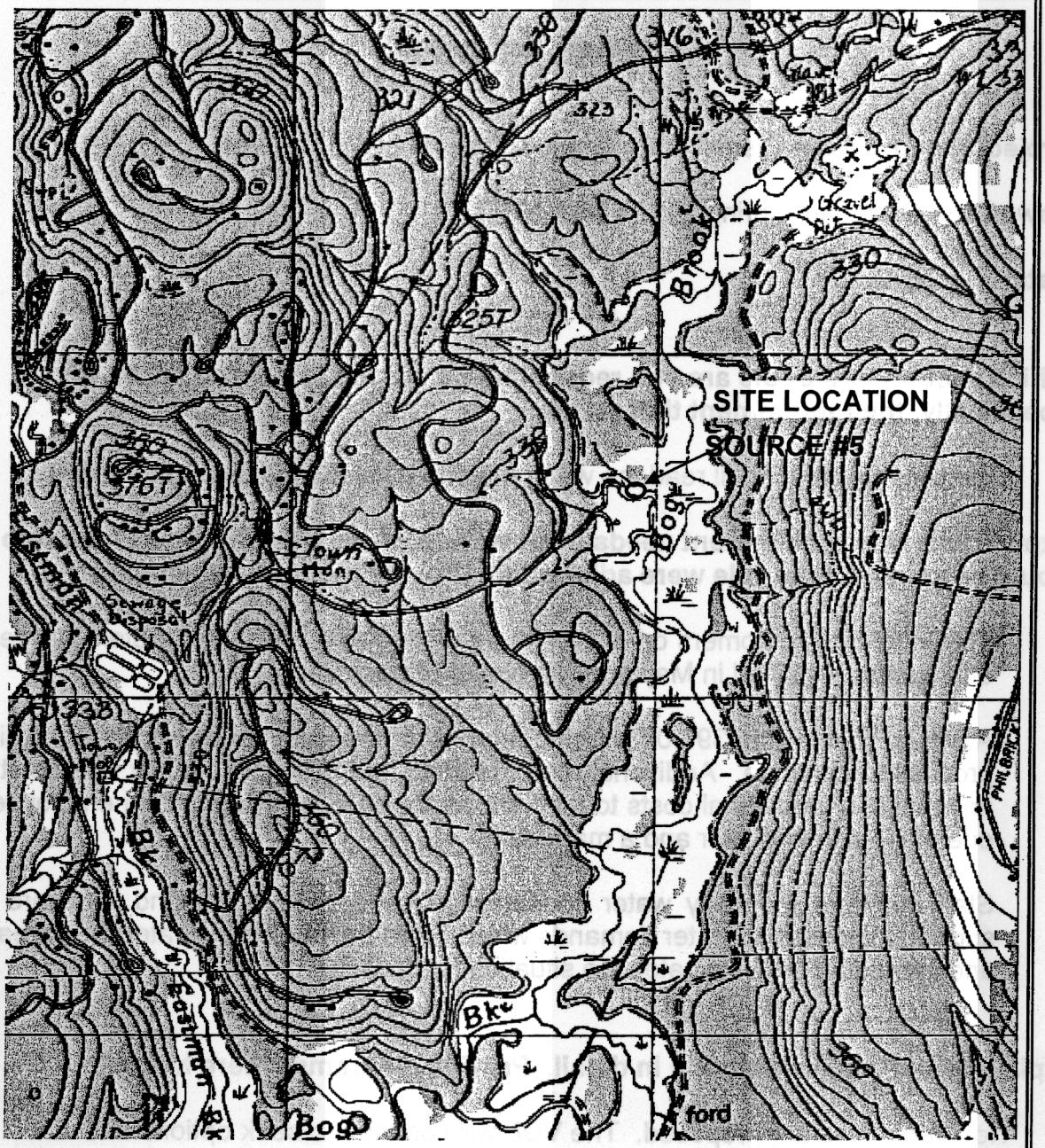
Staff monitors the daily water consumption on a daily basis and is aware of sudden increases in water demands which could be caused by watermain breaks and immediately investigates the situation for causes.

Explain an alternative solution in detail. Provide diagrams where helpful.

No alternatives are proposed. The VDE will continue to seek options and alternatives for increasing the frequency of reading and billings.

Explain how the alternative would adequately address water conservation measures as required by the rule.

Staff monitoring of the water system including system pressures and the SCADA system will ensure an awareness of water use on a daily basis.



NORTH

Source: USGS
Enfield Center Quad

LOCATION PLAN-SOURCE #5 VILLAGE DISTRICT OF EASTMAN SPRINGFIELD, NEW HAMPSHIRE			
GS ENVIRONMENTAL AND GROUNDWATER ASSOCIATES PO BOX 4247 PORTSMOUTH, NH 03802			
Drawn By:	GS	Scale: 1" = 2083'	Proj. No.: 200701NH
Checked By:	LS	Date: 2/15/2007	Figure: 1