



The  
NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES

hereby issues

LARGE GROUNDWATER WITHDRAWAL PERMIT

NO. LGWP-2008-0002

to the permittee

MERIDEN VILLAGE WATER DISTRICT  
P.O. BOX 171  
MERIDEN, NH 03770-0171  
(603-469-3486)

for the withdrawal of the following volumes of groundwater from the following wells for the purpose of community water supply:

Well A	57,600 gallons over any 24-hour period
Well B	79,200 gallons over any 24-hour period

Date of Issuance: June 30, 2008

Date of Expiration: June 30, 2018

Pursuant to authority in N.H. RSA 485-C:21, the New Hampshire Department of Environmental Services (NHDES), hereby grants this permit to withdraw groundwater from well A and well B subject to the following conditions:

1. The permittee shall comply with the requirements of Env-Ws 388 and RSA 485-C at all times.

2. **Water Conservation:** The permittee shall implement the approved Water Conservation Plan, dated January 21, 2008, in accordance with Env-Ws 390 and NHDES' conditional approval dated March 26, 2008.
3. **Metering Requirements:** Withdrawals from all sources must be metered at all times. The permittee shall read source water meters at least once every 30 days. All meters must be selected, installed, tested, and maintained in accordance with the AWWA M6 manual as referenced in Env-Ws 390. The permittee shall provide NHDES with a certificate of calibration and performance specifications for each meter. The permittee shall document and maintain records of all meter maintenance and calibration activities and submit this information to NHDES in an annual report by January 31 of each year.
4. **Monitoring and Reporting Requirements:** The permittee shall establish and maintain the monitoring and reporting program as described below.
  - a) **Existing Off-Site Private Residential Dug Well Water Level Monitoring:** The permittee shall install a pressure transducer and data logger and measure water levels at a frequency of at least once every four hours in the following private dug well. Water level monitoring shall commence upon initiating a withdrawal from well A or well B and shall continue indefinitely as a condition of this permit.

Tax Map / Lot Number	Owner of Record Listed in Final Report
20080002DW01	

If a private well owner denies permission to monitor water levels or if the identified well cannot be monitored due to a structural limitation, then the permittee shall propose an alternative monitoring location to NHDES for approval. Upon receiving approval from NHDES, the permittee shall install the monitoring well, if not already available, and monitor water levels at the alternative location at the same frequency as the original monitoring well proposed.

All water level monitoring shall be completed by a person who can demonstrate, by education or experience, competency in collecting and reporting hydrogeologic measurements.

All monitoring data shall be submitted to NHDES annually by January 31 of each year. An annual monitoring report shall be submitted in an electronic format and hard copy format. All water level monitoring data shall be submitted in an electronic format only.

The annual monitoring report shall note any relevant observations that may affect the water level measurements and include all field notes documenting the monitoring activities for the preceding year. All field notes shall be signed and dated by the personnel responsible for collecting measurements.

Monitoring well locations and frequencies may be added or changed if the water level data obtained contradict the information provided in the permittee's application, or if additional data points are required to assess the potential for adverse impacts to occur.

5. Mitigation Requirements

- a) Prior to initiating the large groundwater withdrawal, the permittee shall notify the owner of each of the following properties that their private well is within the area identified as the estimated 180-day zone of influence of the production wells.

Tax Map / Lot Number	Owner of Record Listed in Final Report

The permittee shall provide copies of certified returned mail receipts to NHDES. The permittee shall explain to each lot owner that their well may be influenced by the withdrawal at wells A and B. The permittee shall provide these owners with contact information for both the permittee and NHDES in the event they believe they may be adversely impacted by the withdrawal.

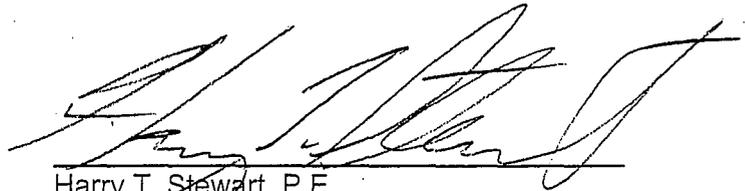
- b) In the event that adverse impacts occur, the permittee shall comply with all of the requirements below and with the impact mitigation and source replacement requirements of Env-Ws 388.
- c) The permittee shall notify NHDES of any adverse impact within 12-hours of receiving such information. Furthermore, the permittee shall provide potable water for drinking and cooking purposes to a well owner that NHDES has determined to be adversely impacted. The permittee shall have 12 hours to provide drinking and cooking water after being notified of an occurrence of an adverse impact. The permittee shall provide potable water for other domestic uses within 36 hours of being notified of an adverse impact (e.g., lower well pump, install higher capacity well pump, drill a new well, or truck bulk water to the property). A permanent alternative water supply that produces water quality that complies with Federal and State drinking water quality requirements and a quantity of water that complies with the requirements of RSA 485-C:21 V-c, shall be provided to an adversely impacted water user within 30 days of NHDES determining that a water user has been adversely impacted.

Contracts with companies capable of providing water and well services (including drilling of new wells) must be developed and maintained prior to and after initiating the withdrawal such that in the event that impacts are noted at private wells, mitigation steps can be undertaken expeditiously. Copies of these contracts shall be provided to NHDES prior to initiating the large groundwater withdrawal.

- d) Where the status of an unanticipated impact is not clear, the permittee shall gather information needed to quantify the impact and determine its status relative to adverse impact criteria defined under RSA 485-C:21 V-c and provide this information to NHDES within 48 hours of being notified by NHDES. A verified adverse impact shall be mitigated as described in paragraph c), above.

- e) NHDES will routinely review the results of all monitoring data, and if water level monitoring data indicates that groundwater is being extracted at a rate that exceeds natural recharge on average, then NHDES will modify the permit in accordance with Env-Ws 388 in order to prevent adverse impacts from occurring.
6. The permittee shall register its new sources of water under the Registered Water User Program and maintain the water use reporting requirements established by RSA 488.
7. The permittee shall apply for renewal of this permit at least 365 days prior to its expiration date. The permittee shall continue to comply with all conditions in this permit until the permit is renewed or the facility is closed in accordance with all applicable requirements, regardless of whether a renewal application is filed.

Any person aggrieved by any terms or conditions of this permit may appeal in accordance with RSA 21-O:7,IV within 30 days.



Harry T. Stewart, P.E.,  
Director Water Division

## PROJECT NARRATIVE

**Large Well Siting Approval/Large Groundwater Withdrawal Permit LGWP-2008-0002  
Meriden Village Water District, EPA ID 1921020  
Wells A and B  
Meriden, New Hampshire**

**June 30, 2008**

### BACKGROUND

The Meriden Village Water District (MVWD), located in Plainfield, NH, has submitted an application to the New Hampshire Department of Environmental Services (NHDES) requesting approval of two large community production wells and issuance of a large groundwater withdrawal permit for the withdrawal of up to 136,800 gallons per day (gpd) or 95 gallons per minute (gpm) over a 24-hour period. The production volume proposed for one well, designated well A, is 57,600 gpd or 40 gpm over a 24-hour period; the production volume proposed for the second well, designated well B, is 79,200 gpd or 55 gpm over a 24-hour period.

The purpose of the two new community overburden production wells is to: replace the capacity of an existing overburden dug well currently permitted for 57,600 gpd; provide additional supply capacity for potential future increases in demand; and, bring the water system into compliance with the large community water system design standard requirement for water supply capacity. The existing dug well used by the water system has experienced capacity shortfalls over the last 5 to 10 years during periods of low precipitation, and is known to be a relatively shallow well in comparison to the saturated thickness of the aquifer in which it is located. Given the fact that the existing dug well will serve as a back-up source for the two new sources, the incremental increase in production volume being sought by MVWD is 79,200 gpd [55 gpm over a 24-hour period]. The two new community production wells are located in the same general area as the dug well; specifically, in an open-field to lightly wooded area approximately 300 feet south-southwest of the Plainfield Elementary School, on land owned by the Plainfield School District.

Wells A and B are located in the Village of Meriden within the watershed of Bloods Brook. The watershed upgradient of the new wells covers an area of about eight square miles, draining the western slopes of Croydon Mountain northwesterly to the Connecticut River approximately five miles downstream. The potential impact area associated with wells A and B is approximately two square miles, extending approximately one mile west-northwest of the center of Meriden village, to approximately 2,000 feet southeast of NH Route 120, to an area within the southern portion of the Anne Duncan State Forest.

The watershed of Bloods Brook is characterized by moderately steep to steep hillsides mantled with a relatively thin layer of glacial till. Till covered uplands transition westerly to a relatively discrete sand and gravel filled valley generally interpreted as an alluvial plain 'sandwiched' between French's Ledge and Fifield Hill in the southwest portion of Meriden village. Wells A and B are installed within the valley in an unconsolidated fine- to coarse-grained sand and gravel unit with varying amounts of cobbles and boulders. It is reported that both proposed production wells encountered about 46 feet of sand and gravel, and each well was completed to a depth of approximately 46 feet as natural gravel pack wells.

## WITHDRAWAL TESTING AND CONCLUSIONS

A withdrawal test program was conducted by Pathways Consulting, LLC (Pathways) from May 20, 2005 to June 17, 2005. The purpose of withdrawal testing is to provide data to estimate long-term sustainable water quantity and quality; observe the response of the aquifer to pumping; evaluate the degree of hydraulic connection with private water supply wells and Bloods Brook; and, assess the potential for adverse impacts to water resources and users that may result from the proposed withdrawal. The withdrawal test program included monitoring during pre-pumping, pumping, and water level recovery periods, where wells A and B were pumped at constant rates of 85 gpm and 55 gpm, respectively, beginning on June 10, 2005. Pumping of each well ceased on June 15, 2005.

Water level measurements were collected during the withdrawal test program at eight on-site overburden well locations and two surface water flow stations located within Bloods Brook, upstream and downstream of the wellfield. Surface water flow measurements were recorded to assess the degree of hydraulic connection between the brook and the wells. Water level measurements were collected off-site at two private residential dug wells, one of which is an abandoned well that was previously used as a potable water source prior to the property owner connecting to the water system. Each of the proposed production wells was metered to maintain a constant rate during the withdrawal test program. Although some water quality samples were collected from each production well during the pumping period, an oversight during sampling necessitated the performance of a second, supplemental pumping and water quality sampling program in order to adequately characterize the quality of the water derived from the wells. The supplemental water quality program was conducted over a three day pumping period between May 2, 2008 and May 5, 2008.

Water level measurements collected during the withdrawal test program indicate that most of the on-site wells and the private, unused off-site well responded to pumping of the proposed production wells. The pumping-induced drawdown of water levels ranged from 0.2 feet to 3.2 feet in these wells and was greatest in wells located closest to the production wells. Based on a graphical projection of the water level in the private, unused well, pumping-induced drawdown of the water level in the well assuming 180-days of continuously pumping wells A and B at 95 gpm with no net recharge to the aquifer is estimated to be approximately 0.5 feet. In addition, no significant differences in streamflow in Bloods Brook were observed during the testing period.

Although tested at a combined withdrawal rate of 140 gpm (85 gpm for well A and 55 gpm for well B), MVWD is requesting that well A only be permitted for 40 gpm due to MVWD's limited control of land for a sanitary protective area for this well. Based on withdrawal test monitoring results presented in the final report, a production rate of 136,800 gpd [95 gpm] is a production rate that the wells and geologic formation can sustain.

Results of water quality sampling conducted during the withdrawal test program indicate acceptable water quality, with all parameters below applicable Maximum Contaminant Levels (MCLs). The pH of the water derived from both of the wells, however, was recorded below the Secondary Maximum Contaminant Level (SMCL) range of 6.5 to 8.5 and may necessitate treatment of the water prior to its use in the system.

## **PUBLIC INVOLVEMENT**

Pursuant to RSA 485-C:21-II through V-a, materials submitted in support of the large groundwater withdrawal permit (the preliminary permit application, final report, supplemental materials, etc.) were sent (via certified mail) to the municipality and public water suppliers in the potential impact area of the withdrawal. The Town of Plainfield was the only entity sent copies of the above-referenced materials; no other municipalities or public water suppliers were located within the potential impact area. No public meetings were requested, and no public meetings were held regarding the application for this large groundwater withdrawal permit.

## **LARGE GROUNDWATER WITHDRAWAL PERMIT PUBLIC NOTIFICATION, MONITORING, REPORTING AND WITHDRAWAL REQUIREMENTS**

The large groundwater withdrawal permit requires MVWD to notify any lot owner with a private or public well within an area surrounding wells A and B identified as the zone of influence after 180 days of pumping at 95 gpm with no recharge. As part of this notification, MVWD must explain to the lot owners with wells in the identified area that their well may be influenced by the withdrawal at wells A and B and provide them with contact information at MVWD and NHDES in the event they believe they may be adversely impacted by the withdrawal.

The large groundwater withdrawal permit requires MVWD to establish a water level monitoring program that includes monitoring the water level in the off-site unused residential dug well east of the site. The permit requires this site be monitored to assess the potential for an adverse impact in other off-site in-use residential dug wells in the same general vicinity.

An impact mitigation program would be implemented in accordance with conditions of the large groundwater withdrawal permit and Env-Ws 388 if an adverse impact is observed and verified. The program would implement actions necessary to mitigate the impact including reduction of the withdrawal volume, implementation of water use limitations, replacement of impacted sources with an alternative water supply at no initial capital cost to the user, and establishing a monitoring network to assess performance of the mitigation program. More information concerning these requirements is provided in the large groundwater withdrawal permit (LGWP-2008-0002) under condition No. 5.

MVWD is required to submit an annual report in hard copy and electronic format to NHDES by January 31<sup>st</sup> of each year. As stipulated in the permit, the annual report will include a summary of trends and variability observed in the monitoring results, all monitoring data and records required by the permit, and an assessment of the potential impacts associated with the withdrawal. The annual report will be made available to the public for review. A complete description of monitoring and reporting requirements is presented in more detail in the large groundwater withdrawal permit (LGWP-2008-0002) under condition No. 4.