NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES

hereby issues

LARGE GROUNDWATER WITHDRAWAL PERMIT

NO. LGWP-2008-0003

to the permittee

BELMONT WATER DEPARTMENT
143 MAIN STREET
P.O. BOX 310
BELMONT, NH 03220-0310
(603-267-8301)

for the withdrawal of the following volume of groundwater from the following well for the purpose of community water supply:

GPW-3, 648,000 gallons over any 24-hour period;
GPW-3, GPW-2, GPW-1[Backup Only] a total of 936,000 gallons over any 24-hour period.

Date of Issuance: September 10, 2008
Date of Expiration: September 10, 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 GPW-3 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 June 14, 2007, in accordance with Env-Ws 390 and NHDES' conditional approval dated July 2, 2007.

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. Mitigation Requirements

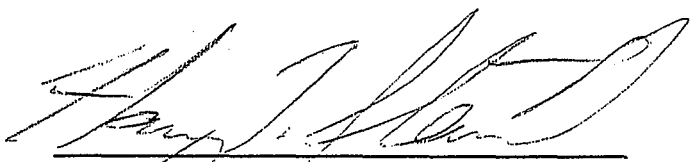
   a) In the event that adverse impacts occur, the permittee shall comply with all of the requirements below and with the impact mitigation and source replacement requirements of Env-Ws 388.

   b) 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 in accordance with Env-Ws 388.

5. 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.

6. 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

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PROJECT NARRATIVE

Large Well Siting Approval/Large Groundwater Withdrawal Permit LGWP-2008-0003
Belmont Water Department, EPA ID 0201010, GPW 3
Belmont, New Hampshire

September 10, 2008

BACKGROUND

The Belmont Water Department (BWD), located in Belmont, NH, has submitted an application to the New Hampshire Department of Environmental Services (NHDES) requesting approval of a large community production well and issuance of a large groundwater withdrawal permit for the withdrawal of up to 648,000 gallons per day (gpd) or 450 gallons per minute (gpm) over a 24-hour period.

The purpose of the new community production well (designated GPW-3) is to: reduce the reliance on the existing production wells that currently serve the water system; provide additional water supply capacity for potential future increases in demand; and, address poor water quality issues related to the system's current water supply wells. The two existing wells serving the water system are gravel packed wells, designated GPW-1 and GPW-2, with production volumes of 130 gpm and 200 gpm, respectively. GPW-1 and GPW-2 were installed in the 1960s and 1970s in a low-lying, filled wetland area immediately southeast of Pout Pond in Belmont. Both GPW-1 and GPW-2 have historically produced water with high iron and manganese concentrations that is believed to be linked to the former (now filled) wetland area in which they are installed. When GPW-3 is brought online, it will operate in conjunction with existing well GPW-2 and is intended to reduce the iron and manganese-related water quality issues. Existing well GPW-1 will be relegated to a mechanical back-up water source for the system; therefore, additional production from GPW-3 equates to an incremental increase in capacity for BWD of 460,800 gpd [or 320 gpm over a 24-hour period].

GPW-3 is located in BWD's existing water supply wellfield, southwest of the center village area of Belmont and within the watershed of Pumping Station Brook. The watershed upgradient of the new well covers an area slightly over three square miles and drains the northern slopes of hills that border the southern limit of the town. This watershed drains northerly, through the wellfield, and discharges to the Tioga River valley, a substantial portion of which constitutes the potential impact area for well GPW-3.

The watershed of Pumping Station Brook is characterized by moderately steep hillsides mantled with a relatively thin layer of glacial till. These till-covered uplands serve as the catchment for Clough Pond, and transition northerly to a relatively discrete sand and gravel filled valley that occupies about one third of the watershed, and is locally referred to as the Pumping Station Brook aquifer. This aquifer is generally interpreted as a vertical sequence of relatively fine-grained deltaic sand deposits overlain and bounded by coarse-grained meltwater (esker) deposits. BWD wells GPW-1, -2 and -3 are located in this unit near a 'kettle-hole' pond (Pout Pond) located at its northern limit. GPW-3 is installed along the steep slope of the esker that bounds the western limit of the aquifer, south of Pout Pond, and is completed within silty, fine- to coarse-grained sands and gravels with varying amounts of cobbles. GPW-3 is between 500 to 900 feet west of existing wells GPW-1 and -2, and is reported to have encountered greater than 50 feet of sands and gravel to a depth of about 89 feet.

WITHDRAWAL TESTING AND CONCLUSIONS

A withdrawal testing program was conducted by Hydrosource Associates Inc. (Hydrosource) from January 30, 2008 to February 14, 2008. 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 Pout Pond and the existing water supply wells; and, assess the potential for adverse impacts to water resources and users that may result from the proposed withdrawal. The withdrawal testing program included monitoring during pre-pumping, pumping, and water level recovery periods, where GPW-3 was pumped at 450 gpm between February 6 and 11, 2008.

Water level measurements were collected during the withdrawal test program at seven on-site overburden well locations and three surface water level monitoring points. Surface water measurements were recorded to assess the degree of hydraulic connection between the well and Pout Pond, Pumping Station Brook and Tioga River. Water level measurements from an off-site well that is not used for potable purposes were collected to assess background conditions in the overburden aquifer during the withdrawal testing. No private domestic wells were monitored during the pumping test as none were present within the Pumping Station Brook aquifer or within 1,000 feet of GPW-3. The closest private wells are on the order of 2,600 feet from GPW-3 and, based on records at DES and a door-to-door survey conducted by Hydrosource and BWD, are bedrock water supply wells. Discharge was metered during the withdrawal testing program to maintain a constant rate and water quality samples were collected during the pumping period to characterize the quality of the water derived from the well.

Water level measurements collected during the withdrawal testing program indicate that most of the on-site wells responded to pumping of GPW-3. The pumping-induced drawdown of water levels ranged from 0.4 feet to 11 feet in these wells and was greatest in wells located closest to the production well. Based on a graphical projection of the water level response observed during withdrawal testing, pumping-induced drawdown of water levels assuming 180-days of continuously pumping GPW-3 at 450 gpm with no net recharge to the aquifer is estimated to extend on the order of 1,000 feet from the well. In contrast, a lack of water level response in a shallow piezometer and staff gages installed in/around Pout Pond relative to nearby deeper monitoring points indicates little to no direct hydraulic connection between the well and the pond during the testing period. Overall, based on monitoring results presented in the final report, a production rate of 648,000 gpd [450 gpm] is a production rate that the well and geologic formation can sustain.

Results of water quality sampling conducted during the withdrawal testing program indicate acceptable water quality, with all standard drinking water parameters below applicable Maximum Contaminant Levels (MCLs). The pH of the water derived from GPW-3, however, was recorded below the Secondary Maximum Contaminant Level (SMCL) range of 6.5 to 8.5 and will necessitate treatment of the water prior to its use in the system. In addition to the standard analytical parameters, a microscopic particulate analysis (MPA) sample was collected at the end of the pumping test program to assess the potential for the water from the well to be designated groundwater under the direct influence of surface water (GWUDI). Although results of the MPA sample indicated a moderate risk of GPW-3 being GWUDI due to the presence of algae in water pumped from the well, lack of supporting information from field screening data and water level monitoring conducted during the withdrawal test indicates that the presence of algae may be a relic of ambient conditions in the overburden aquifer.

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 municipalities and public water suppliers in the potential impact area of the withdrawal. The towns of Belmont, Gilford, Gilmanton, Northfield; and the water systems of Cantebury Crossings and Lakes Region MHP were sent copies of the above-referenced materials. 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

In the event that an adverse impact is reported and verified, 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-2008-0003) under condition No. 4.