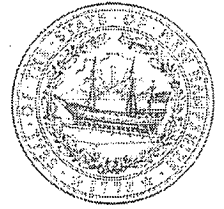




The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES



Thomas S. Burack, Commissioner

November 1, 2010

Jennifer Perry
Town of Exeter
Public Works Department
13 Newfields Road
Exeter, NH 03833

**RE: Approval for Reactivation of Large Community Production Wells
Exeter Water Department, EPA ID 0801010
Gilman Park Well (Source ID 007) and Stadium Well (Source ID 006)
Exeter, New Hampshire**

Dear Ms. Perry:

The New Hampshire Department of Environmental Services (NHDES) has conditionally issued to the Exeter Water Department (Exeter) an approval to reactivate two large community production wells (Gilman Park Well [Source ID 007] and Stadium Well [Source ID 006]) in accordance with New Hampshire Administrative Rules Env-Dw 302, *Large Production Wells for Community Water Systems*. The approval is based on information prepared for Exeter by Weston & Sampson Engineers, Inc. (Weston & Sampson).

Exeter is seeking approval to reactivate the Gilman Park Well at a production rate of 331,200 gallons per day (gpd), or 230 gallons per minute (gpm) over a 24-hour period. The Gilman Park Well is located approximately 600 feet south of the confluence of the Little River and Exeter River in Gilman Park, a small recreational park north of Bell Avenue. Exeter is also seeking approval to reactivate the Stadium Well at a production rate of 720,000 gpd, or 500 gpm over a 24-hour period. The Stadium Well is located southwest of the Phillips Exeter Academy's football stadium, just east of the Exeter River.

According to information provided by Weston & Sampson, the Gilman Park Well served Exeter from 1951 to 1959 and was deactivated due to aesthetic water quality problems. The Stadium Well served as Exeter's primary source of drinking water from 1963 to 1969 when Exeter shifted their supply to a combination of groundwater and surface water sources; the well has been out-of-service since approximately 1986. The purpose of reactivating the wells is to provide Exeter with additional water supply diversification and redundancy.

CONDITIONAL APPROVAL

This decision to conditionally approve the reactivation of the Gilman Park Well and the Stadium Well is based on information contained in the following documents:

1. Preliminary report titled "Preliminary Hydrogeologic Report, Stadium & Gilman Well Sites, Exeter, New Hampshire" (Preliminary Report) prepared for Exeter by Weston & Sampson, dated November 26, 2008.

2. Preliminary report addendum prepared for Exeter by Weston & Sampson, dated February 25, 2009. The submittal contains the response to NHDES' letter containing Preliminary Report review comments dated January 16, 2009.
3. Final report titled "Gilman & Stadium Pumping Test Report Env-Dw 302.23" (Final Report) prepared for Exeter by Weston & Sampson, dated September 8, 2010.

The following requirements are associated with the approval of the Gilman Park Well and the Stadium Well for use as large production wells for a community water system and **must be complied with as a condition of approval:**

- 1) In the Final Report, Weston & Sampson reported that the 100-year flood elevation at the well sites is approximately 32 feet NGVD. In accordance with Env-Dw 302.05(c), the Gilman Park Well and the Stadium Well shall not be subject to flooding at the 100-year recurrence interval. NHDES concurs with Weston & Sampson's proposal to extend the permanent casings of both wells to an elevation of 34 feet, two feet above the 100-year flood elevation. Exeter may fill to elevate the wellheads and pumping stations for flood protection purposes, provided that all required permits for placing of fill within wetlands and flood plains have been obtained; if applicable. Provide documentation to the Drinking Water and Groundwater Bureau that the permanent casings of both wells have been elevated for flood protection purposes prior to connecting the wells to the water system.
- 2) Exeter must maintain a wellhead protection program for the Wellhead Protection Area (WHPA) of the Gilman Park Well and the Stadium Well consisting of: 1) updating the inventories required by Env-Dw 302.09 and 302.19 at intervals no greater than three years as required by Env-Dw 302.21(a)(1) starting 90 days from the date of this letter; 2) completing written notification requirements to the owner of each known and potential contamination source listed in the inventories at intervals no greater than three years as required by Env-Dw 302.21(a)(2) starting 90 days from the connection of the Gilman Park Well or the Stadium Well to the water system; and 3) submit a request to conduct site visits to survey all potential contamination sources (except for pesticide application and agricultural operations) located within the WHPA to ascertain compliance with best management practices for preventing groundwater contamination at intervals no greater than three years as required by Env-Dw 302.21(b), starting within one year of the date of this letter. Written notification shall include a copy of Env-Wq 401, *Best Management Practices for Groundwater Protection*, Drinking Water and Groundwater Bureau Fact Sheet WD-DWGB-22-4 Best Management Practices (BMPs) for Groundwater Protection, and BMP Flyer for Backyard Mechanics and Hobbyists. These three documents are available on the NHDES website at <http://des.nh.gov/organization/divisions/water/dwgb/dwspp/bmps/index.htm>.
- 3) Total coliform bacteria were detected in the water sample collected from the Stadium Well at the end of the well's pumping test program. Within 30 days prior to placing the Stadium Well in service and providing water to the public, Exeter must collect a raw water sample from the well and have the sample analyzed for total coliform bacteria using a method that provides enumeration. A copy of the laboratory results shall be provided to Christine Bowman of the Drinking Water and Groundwater Bureau via email to christine.bowman@des.nh.gov when they are available.
- 4) In accordance with Env-Dw 717, *Groundwater Monitoring and Treatment*, if Exeter is proposing the use of a treatment process to disinfect groundwater derived from the Gilman Park Well and

the Stadium Well, Exeter shall demonstrate that the proposed disinfection option meets the requirements for 4-log treatment, or conduct 6 months of sampling to demonstrate that 4-log treatment is not required.

If sampling is conducted, Exeter must collect raw water samples from each well and have the samples analyzed for *E. coli* using a method that provides enumeration. Sampling of raw water collected from each well shall be conducted for **6 consecutive months**, with the first month's sample taken **within 30 days prior** to placing the source in service and providing water to the public. **All raw water samples must be taken before any treatment.** Results shall be reported to NHDES as part of the GWR-Investigative Monitoring required to demonstrate that the source water is free from fecal contamination and that 4-log treatment is not required. A special analysis request form for these samples is available linked to the water system's Master Sampling Schedule, which is available through the Public Water System Query on NHDES' One Stop Data and Information website at http://www2.des.state.nh.us/OneStop/Public_Water_Systems_Query.aspx.

- 5) Copies of the fully executed easements for the well site properties (as described in Section 7.0 of the Final Report) recorded with the Rockingham County Registry of Deeds shall be provided to NHDES prior to placing the Gilman Park Well and the Stadium Well in service and providing water to the public.
- 6) Monitoring well STTW2 S/D shall be decommissioned because of compromised well construction that allows hydraulic communication between the unconfined aquifer and confined aquifer (as described in Section 2.0 of the Final Report). Decommissioning of the well shall be completed by a NH licensed water well contractor. Please contact Rick Schofield, NHDES' Water Well Program Manager, at (603) 271-1974 or richard.schofield@des.nh.gov regarding acceptable methods for monitoring well decommissioning. Decommissioning of the well shall be completed prior to placing the Gilman Park Well and the Stadium Well in service and providing water to the public. A copy of the well completion report for the decommissioned well [or the DES-assigned Water Resources Board (WRB) number for the well completion report] shall be provided to Christine Bowman of the Drinking Water and Groundwater Bureau via email to christine.bowman@des.nh.gov when it is available.
- 7) Withdrawals from the Gilman Park Well and the Stadium Well must be metered at all times. All meters must be selected, installed, tested, and maintained in accordance with the AWWA M6 manual as referenced in Env-Wq 2101. Exeter must provide NHDES with a certificate of calibration and performance specifications for each meter. Exeter must document and maintain records of all meter maintenance and calibration activities. Exeter must read source water meters to adequately report the following volumes to the reporting program referenced in condition No. 7 of this approval:
 - a) The 24-hour peak day volume withdrawn from each source during each month; and
 - b) The cumulative total volume withdrawn from each source during each month.
- 8) Exeter must register its new sources of water with the NHDES Water Use Registration and Reporting Program and maintain the water use reporting requirements established by RSA 488 and this approval.

- 9) Exeter shall obtain any necessary permits from the NHDES Wetlands Bureau for any activities related to the development of the well sites that are within the protected shoreland of the Little River or Exeter River and require a permit. Please contact the NHDES Wetlands Bureau at (603) 271-2147 for more information about the specific requirements of the shoreland protection regulations.

- 10) Approval for the Gilman Park Well and the Stadium Well shall lapse four years from the date of this letter if the wells are not connected to the water system within that time, in accordance with Env-Dw 302.24(e), unless an extension is granted by NHDES. If approval lapses, Exeter must satisfy the requirements of Env-Dw 302.24(f) to regain approval.

SOURCE SPECIFICATIONS

Table 1, below, summarizes specifications for the Gilman Park Well and the Stadium Well. The Permitted Production Volume is the maximum volume of groundwater allowed by NHDES to be pumped from the water supply production well in any 24-hour period. The Sanitary Protective Area is a circle, centered on the well, with the radius listed in Table 1. The location of the Gilman Park Well and the Stadium Well and the WHPA delineated for the wells are illustrated on the attached figure titled “Gilman and Stadium Production Wells Proposed Wellhead Protection Area.”

Table 1

Source Name and ID	Well Status	Permitted Production Volume	Sanitary Protective Area Radius	Wellhead Protection Area	Source Description
Stadium Well (Source ID 006)	Existing (Reactivation)	720,000 gallons per 24-hour period	400 feet	As shown on the attached figure	Approximately 230 feet west of Gilman Lane
Gilman Park Well (Source ID 007)	Existing (Reactivation)	331,200 gallons per 24-hour period	400 feet	As shown on the attached figure	Approximately 150 feet east of Bell Avenue

CHEMICAL MONITORING PROGRAM

A water quality sampling program was conducted as part of the well siting approval of the Gilman Park Well and the Stadium Well.

Gilman Park Well

A total of three water quality samples were collected from the Gilman Park Well during the well’s pumping test program over the period July 7 through July 12, 2009. Results of the water quality

sampling program indicate that each parameter, with the exception of arsenic, iron, and manganese, was below the applicable Maximum Contaminant Level (MCL) or Secondary Maximum Contaminant Level (SMCL).

The MCL for arsenic is 0.010 milligrams per liter (mg/l); testing results show the concentration of arsenic in water derived from the Gilman Park Well is 0.013 mg/l, which exceeds the MCL. The SMCL for iron is 0.30 mg/l; testing results show concentrations of iron in water derived from the Gilman Park Well in the range of 0.89 to 1.7 mg/l, which exceeds the SMCL. The SMCL for manganese is 0.05 mg/l; testing results show concentrations of manganese in water derived from the Gilman Park Well in the range of 0.33 to 0.43 mg/l, which exceeds the SMCL.

Stadium Well

A total of three water quality samples were collected from the Stadium Well during the well's pumping test program over the period July 9 through July 14, 2009. Results of the water quality sampling program indicate that each parameter, with the exception of iron and manganese, was below the applicable MCL or SMCL.

Testing results show concentrations of iron in water derived from the Stadium Well in the range of 1.0 to 1.4 mg/l, which exceeds the SMCL. Testing results show concentrations of manganese in water derived from the Stadium Well in the range of 0.55 to 0.65 mg/l, which exceeds the SMCL.

In the Final Report, Exeter proposed treating for elevated levels of iron and manganese in water being delivered from the Gilman Park Well and the Stadium Well. A water treatment pilot study conducted during the pumping test program also demonstrated that removal of arsenic in water derived from the Gilman Park Well is achievable in conjunction with the iron and manganese removal (see **CONNECTION REQUIREMENTS** below).

Results of the water quality sampling program also indicate that the concentration of radon is elevated in water derived from the Gilman Park Well and the Stadium Well. One sample was obtained from each well and analyzed for radon. Radon was detected at a concentration of 1,384 picocuries per liter (pCi/L) and 972 pCi/L in the Gilman Park Well and the Stadium Well, respectively. Although there is currently no state- or federally-enforced drinking water standard for radon, NHDES recommends that Exeter consider options for reducing the concentration of radon in the water supply.

You must notify NHDES when the Gilman Park Well and the Stadium Well become active by contacting Linda Thompson of the Drinking Water and Groundwater Bureau at (603) 271-3544 or linda.thompson@des.nh.gov. Once you notify NHDES that a well is active, Chemical Monitoring staff will contact you with an updated Master Sampling schedule. If you have any questions about the Chemical Monitoring requirements, contact Tricia Madore at (603) 271-3907 or tricia.madore@des.nh.gov. Please note that NHDES may initiate enforcement action if the system fails to implement a chemical monitoring program when a well becomes active.

CONNECTION REQUIREMENTS

Please note that the connection of the wells to the water system and treatment facilities must comply with the requirements of New Hampshire Administrative Rules Env-Ws 374, *Design Standards For Large Public Water Systems*. Prior to connecting the wells to the water system, provide a schematic depicting the source meter(s), chemical monitoring program sampling location, and any required treatment system,

including the storage location of chemicals, chemical feed equipment, motor controls, and instrumentation. Please forward this information and any questions you may have regarding connecting the wells to the water system to the attention of Richard Skarinka at NHDES at (603) 271-2948 or richard.skarinka@des.nh.gov.

EMERGENCY PLAN

Exeter shall update its emergency plan for the water system in accordance with New Hampshire Administrative Rules Env-Dw 302.26 and Env-Ws 360.15. This plan shall continue to be updated and submitted to NHDES once every 6 years and shall be reviewed annually by the system and updated as needed. NHDES' records indicate that Exeter is due to submit an updated Emergency Plan by March 2015. Additionally, the plan will be a checklist item during each sanitary survey of the water system and lack of one will be a survey deficiency. Guidance documents and other emergency planning information are available on the NHDES website at <http://des.nh.gov/organization/divisions/water/dwgb/wseps/index.htm> [see 'Programs']. You may contact Johnna McKenna at (603) 271-7017 or johnna.mckenna@des.nh.gov for more information or assistance in completing emergency planning for the water system.

If you have any questions about this approval or any other groundwater permitting issues, please contact me at (603) 271-8866 or christine.bowman@des.nh.gov or Stephen Roy at (603) 271-3918 or stephen.roy@des.nh.gov.

Sincerely,



Christine Bowman
Drinking Water and Groundwater Bureau

Attachment: Figure titled "Gilman and Stadium Production Wells Proposed Wellhead Protection Area"

cc: Kevin MacKinnon, Weston & Sampson
Cliff Sinnott, Rockingham Planning Commission (w/ Attachment)
Stephen Roy, NHDES (email)
Derek Bennett, NHDES (email)
Brandon Kernen, NHDES (email)
Richard Schofield, NHDES (email)
Richard Skarinka, NHDES (email)
Cynthia Klevens, NHDES (email)
Johnna McKenna, NHDES (email) (w/ Attachment)
Linda Thompson, NHDES (email)
Selina Makofsky, NHDES (email)
Donna Jones, NHDES (email)
Debra McDonnell, NHDES (email)
George Hastings, NHDES (email) (w/ Attachment)
Darlene Forst, NHDES (email)