

INTERNAL MEMORANDUM

TO: Jean Firth
CC: Naji Akladiss

FROM: Hank Andolsek, Environmental Hydrogeologist, C.G.
Division of Technical Services

DATE: 7/10/07

SUBJECT: Summary of Findings – Former DFSP – Harpswell, Maine.

Introduction. The Town of Harpswell requested assistance from Maine DEP through the Brownfields program to evaluate the feasibility of increasing the permitted pumping rate in the New Facility Supply Well (NFSW) at the Former Defense Supply Point (DFSP). The DEP imposed a pumping limit of 0.3 GPM (450 GPD) - a limit that was listed as a restrictive covenant on a Quit Claim Deed associated with the property. The limit was imposed because of concern that excessive pumping at the supply well would draw in potential fuel contamination known to exist under portions of the former DFSP, and that pumping may alter the existing groundwater flow patterns and contaminant distribution.

History. Soil remediation was conducted by the Navy in conjunction with USEPA and Maine DEP. The above ground storage tanks (ASTs) have been removed along with fuel-contaminated soil. The soil was excavated, thermally treated, and placed back on site. Residual fuel contamination exists, but does not exceed 870 mg/kg, which is a concentration that has been determined to pose no detrimental effect to trespassers and workers.

The NFSW was installed in June 1998 to a depth of 275 feet below ground surface. GZA Geoenvironmental, Inc. (GZA) conducted a 48-hour pump test of the NFSW in 1998 for the purpose of establishing a public supply well. The well sustained a rate of 12 gallons per minute (GPM) for the duration of the test and no fuel-related contamination was detected in the NFSW. This work was conducted on behalf of the Defense Energy Support Center (DESC). Preliminary approval to start the public water supply program was granted by Maine Department of Human Services (DHS), and the well was assigned a potable supply identification #94688.

The DHS outlined the following requirements before final approval could be granted:

- The well location must be at least 300 feet from the nearest leach field;
- Regular testing for VOCs given the historic use of the site;
- Pump test must be performed for a minimum of 48-hours followed by sample collection and analysis;
- Satisfactory results from two water tests must be attained before approval to operate this well as a Transient Non-Community Water System (TNCWS); and
- Final approval must be attained from the Drinking Water Program prior to commissioning the well on line.

Final approval for a Transient Non-Community Water Supply (TNCWS) well was granted by Haig Brochu (DHS) to Tom Lawless (GZA) in a letter dated July 18, 2000. The approved rate was 12 GPM.

As a result of comments by MDEP on the 48-hour pump test report, GZA, on behalf of the DESC, installed additional monitoring wells and conducted a second pump test in February of 2001. The extended pump test was conducted for 72-hours at a rate of 12.75 GPM. GZA concluded that, ignoring potential contamination issues, the NWSW could easily sustain a flow of 12.75 GPM. No fuel-related contamination was detected in the NFSW during well testing.

MDEP Approach. MDEP evaluated site-related conditions that could affect water quality in the NFSW. These conditions include: nearby former ASTs, known spills near the main gate, known groundwater contamination in nearby wells, residual (low level) fuel contamination still present in onsite soil and hydrogeologic conditions that could affect the migration of potential contaminants.

MDEP contracted Woodard and Curran (W&C) to assist with the NWSW evaluation. In September 2006, W&C subcontracted Northeast Geophysical to conduct borehole geophysical surveys on four wells (NFSW, Former Facility Supply Well, Navy Supply Well #1 and Navy Supply Well #2) to evaluate bedrock structure and features affecting groundwater movement. These results are presented in a report entitled *Geophysics and Groundwater Modeling Summary Report, Former DFSP, Harpswell, Maine*, prepared by W&C in November 2006.

The information collected on the distribution of fuel contamination, and of the geologic structure of the bedrock aquifer, was used to help construct a groundwater flow model.

In November 2006, W&C developed a numerical groundwater model (MODFLOW) to evaluate potential impacts of overburden groundwater contamination on the bedrock aquifer. For the purpose of the model, the overburden groundwater in the southern-most portion of the former AST tank farm (i.e., closest to the NFSW) was assumed to be contaminated. The modeling results demonstrated:

- Using MODPATH, no particles were drawn into NFSW pumping at a rate of 6.25 GPM; and
- Particles were drawn into NFSW at a rate of 12.5 GPM.

In January 2007, W&C, on behalf of the MDEP, supervised the installation of “source area” (MW-701) and “sentry” (MW-702) bedrock monitoring wells to determine whether bedrock groundwater contamination exists in the southern portion of the former AST tank farm (Figure 1). The laboratory sampling results, provided in Attachment A, and field observations indicate that:

- MW-701 (250’) was artesian, and flowing water was sampled with no detection of DRO – the well was subsequently abandoned; and
- MW-702 (200’) was artesian but not flowing. The well was sampled and contained no DRO.

In May 2007, W&C supervised the installation of a new source area well (MW-507B), installed fifteen feet into bedrock. A summary of this activity was conveyed in a letter from W&C to MDEP dated June 1, 2007 and entitled “*Bedrock Well Installation, Former Defense Fuel Supply Point – Harpswell, Maine*”. Soil and groundwater was collected for analysis from the MW-507B location, and the sampling results and field observations indicate that:

- The well was artesian and the shallow bedrock groundwater contained no DRO; and
- A soil sample collected from just above the water table contained no DRO.

Conclusions. The following is a summary of the findings of this evaluation:

- No fuel-related contaminants have been detected in the NFSW following either pump test conducted by GZA;
- The groundwater model showed potential influx of water from the southern portion of the former tank farm when the NFSW was pumped at a rate of 12 GPM;
- Installation of source area monitoring wells (MW-701 and MW-507B) in the southern portion of the former tank farm indicated an absence of bedrock contamination;
- Analysis of the vadose zone soil at MW-507B did not identify the presence of fuel contamination;
- The artesian conditions in the bedrock, if maintained, will likely inhibit the vertical migration of potential fuel contaminants that may exist in the overburden groundwater.

Recommendations. Below are recommendations regarding the future use of the NFSW at the former DFSP.

- MDEP recommends eliminating the pumping limit of 450 GPD on the NFSW;
- Given the Town's redevelopment plans for the property, the well will unlikely be classified as a TNCWS. Instead, the well will most likely be considered a Non-Transient Non-Community (NTNC) well. If the Town intends on developing the property for any uses other than those requiring TNCWS status, the well will need to be reclassified.
- Because the well was inactive for over 3 years, the Town must resubmit an application for new well approval with the DHS.
- The Town needs to work directly with the DHS to get the NFSW appropriately permitted and online for use.
- The Town should secure the services of a hydrogeologic consulting firm to assess the appropriateness of GZA's recommended, and DHS' approved rate of 12 GPM, in the event that new development in the area has occurred since 2001, potentially impacting the predicted safe yield of the NFSW.
- Because of the presence of nearby petroleum contamination, the MDEP requires that quarterly sampling for GRO and DRO be conducted in MW-507B, MW-702 and the NFSW for a minimum of two years once the well is in use. After two years of quarterly sampling, the MDEP will evaluate the data and determine what, if any, additional sampling is necessary.
- Although recent modeling and testing conducted by the MDEP indicates that fuel contaminants entering the NFSW from the site is unlikely, the Town should prepare a contingency plan to address the potential for low-level fuel contamination in the NFSW. If the well should become contaminated, the Town will be responsible for mitigating the risk associated with site-related contaminants (e.g., filtration).
- No other locations for groundwater extraction will be permitted on the property without a full hydrogeologic study being completed and demonstrating that clean water can be removed from the aquifer without affecting the distribution of existing contamination.



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

file

JOHN ELIAS BALDACCIO
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

September 15, 2008

RECEIVED

SEP 17 2008

Town of Harpswell

Ms. Kristi Eiane
Town of Harpswell
PO Box 39
Harpswell, ME 04079

RE: Supply well at Mitchell Field

Dear Ms. Eiane:

The Maine Department of Environmental Protection (MEDEP) previously imposed a pumping rate restriction on the supply well in the former Defense Fuel Farm (Mitchell Field) of 450 gallons per day (GPD). This pumping rate restriction was recorded in the quitclaim deed when the Navy transferred the property to the Town of Harpswell in October 2001. This pumping rate was based, in part, on the Town's desire to utilize the site for recreational purposes only.

In November 2006, with a grant from the Brownfield fund, the MEDEP contracted with Woodard and Curran (W&C) to develop a numerical groundwater model (MODFLOW) to evaluate potential impacts of overburden groundwater contamination to the bedrock aquifer. The modeling results demonstrated that:

- no contamination would be predicted to be drawn into the supply well at a pumping rate of 6.25 gallons per minute (GPM) and
- contamination could be drawn into the supply well at a rate of 12.5 GPM.

In May 2007 W&C, on behalf of the MEDEP, supervised the installation of two bedrock monitoring wells to determine whether bedrock groundwater contamination exists in the southern portion of the former above ground storage tank farm. Details of the test can be found in an Internal Memorandum to Jean Firth from Hank Andolsek, dated July 10, 2007. Analytical tests for diesel range organics (DRO) revealed that no contamination was detected in these wells. In addition, soil samples that were collected during the well installation also showed no DRO contamination.

Based on the modeling results and the well sampling analysis mentioned above, the MEDEP will no longer impose a strict pumping limit of 450 GPD on the supply well at the former Defense Fuel Farm. The Town of Harpswell, at its own discretion, may consider increasing the pumping rate up to 6.25 GPM as reflected by the model. The Town must be aware that groundwater modeling is only a predictive method to understand potential impact which may occur at higher pumping rates. The 6.25 GPM

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rate predicted by the model may or may not reflect actual conditions at the site. Consequently, the following conditions must be met if the Town of Harpswell intends to use the well at a pumping rate up to 6.25 GPM.

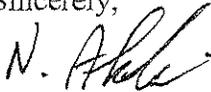
- The MEDEP will require two years of quarterly monitoring for gasoline range organics (GRO) and DRO to be conducted on the supply well due to the presence of nearby petroleum contamination. Following this period, sampling schedules will be reconsidered.
- No other locations for groundwater extraction will be permitted on the property without a full hydrologic study demonstrating that clean water can be removed from the aquifer without affecting the distribution of existing contamination. A prior approval from the MEDEP will also be required.
- The Town needs to work directly with DHHS to secure the appropriate permit for the supply well.
- The Town will prepare a contingency plan to address the potential for low level fuel contamination in the supply well. If the well should become contaminated, the Town will be responsible for mitigating the risk associated with site-related contamination (e.g., through filtration).

If the Town of Harpswell wishes to pump at a higher rate, exceeding the 6.25 GPM , the Town will be required to secure the services of a hydrogeologic consulting firm to assess the appropriateness of GZA 's recommended and DHHS 's approved rate of 12 GPM.

Attached please find copies of the W&C model results and the July 10, 2007 memo to Jean Firth from Hank Andolsek. In the spirit of cooperation between the town of Harpswell and the MEDEP, we encourage you to comply with the requirements outlined above.

If you have any questions related to this letter feel free to contact me at (207) 287-7709.

Sincerely,



Naji Akladiss, P.E.
Remedial Project Manager
Division of Remediation
Bureau of Remediation & Waste Management

cc: Ted Wolfe, MEDEP
Gail Lipfert, MEDEP
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