



MARYLAND DEPARTMENT OF THE ENVIRONMENT

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July 9, 2015

The Honorable Christopher Cerino
Town of Chestertown
118 N. Cross Street
Chestertown MD 21620

Dear Mayor Cerino:

Thank you for your letter of May 4, 2015, regarding the ongoing cleanup at the Shore Regional Health (the Hospital) facility in Chestertown, and for meeting with us on June 30, 2015. The Maryland Department of the Environment (MDE or the Department) appreciates your continued interest in this case and your valued input to the Hospital's proposals. The Department recognizes that the Town of Chestertown (the Town) is concerned about protecting its active supply wells, and we share in those concerns. We also understand that the Town does not have copies of the Hospital's *Pilot Test Evaluation Report and Proposed 2015 Action Plan*, dated January 19, 2015, and *Groundwater Remediation Proposed 2015 Action Plan – Response Letter*, dated April 24, 2015. These documents are posted on the MDE web page which can be accessed using the following links:

<http://mde.maryland.gov/programs/Land/OilControl/RemediationSites/Documents/KE%20Co%20-%20CRHC%20Pilot%20Test%20Eval%20and%20Proposed%202015%20Action%20Plan%201.19.15%20126%20pgs.pdf>

<http://mde.maryland.gov/programs/Land/OilControl/RemediationSites/Documents/KE%20Co%20-%20CRHC%20Proposed%202015%20AP%20Response%204.24.15%2019%20pgs.pdf>

In reviewing the Hospital's revised proposal of April 24, 2015 (*Groundwater Remediation Proposed 2015 Action Plan – Response Letter*), the MDE believes that the proposed full scale remediation plan is safe to implement and will ultimately afford greater protection to the Town's drinking water supply wells than the pump and treat system would ever be able to do. As discussed, enclosed is a summary of the proposed plan and modifications by the Department that we intend to approve. We look forward to discussing this plan with you, the Town Council, and the public during the scheduled July 14, 2015 meeting.

By way of background and history of the site, you will see that the Hospital's plan for further remediation of the heating oil spill is appropriate. The pump and treat system was necessary while the bulk of the mobile oil (i.e. liquid phase hydrocarbons [LPH]) was recovered over the last 24 years. Since 1991, the recovery system extracted over 83,000 gallons of LPH from the subsurface and treated millions of gallons of water in the process. During this time, the released heating oil has been steadily recovered to the point where only residual LPH remain in the subsurface.

When LPH are in a residual state, they are not mobile or capable of spreading, without some external force pushing or pulling them. This not to say that within the established LPH plume footprint there cannot be local draining of LPH into a well, which has been detected periodically at this site in recent years. However, extensive research over the last decade in the field of LPH mobility in the subsurface has demonstrated that the released free phase petroleum typically reaches the maximum extent of migration within a period of approximately two to five years after the release stops, absent any external forces. The mobile LPH released from the Hospital reached its maximum extent several years ago. The remaining residual LPH, which is targeted by the Hospital's plan, can, and has, created a dissolved phase plume that extends past the limits of the area of residual LPH.

As you know, the Hospital's proposal is to use surfactants to mobilize the residual LPH so that it can be recovered during the localized pumping, or Pull events. In addition to the Pull events, the Hospital will continue to operate the existing recovery wells and the pump and treat system. The removal of the residual LPH through the Hospital's plan is important for two main reasons: the pump and treat system will not be able to remove additional LPH alone, and by removing residual LPH, there will be less source material to create dissolved phase hydrocarbons at the site.

We have seen through past sampling efforts that the only appreciable dissolved phase hydrocarbons detected at the site have been north of Brown Street where the residual LPH are located. Currently, the constituents of concern still detected at the Hospital with any considerable concentrations are total petroleum hydrocarbons in the diesel range (TPH-DRO) and naphthalene. Neither of these constituents is very mobile in groundwater and would not be predicted to travel any considerable distance from the residual LPH entrained in the soils on the Hospital property. Removal of residual LPH through the Hospital's plan will further reduce this potential risk.

Conversely, South of Brown Street only minor detections of TPH-DRO, two minor detections of naphthalene, and one minor detection of methyl tertiary butyl ether (MTBE) have been detected since June 2012. It is also important to note that there have been no detections of the typical petroleum constituents benzene, toluene, ethyl benzene, or xylenes or total petroleum hydrocarbons in the gasoline range (TPH-GRO) in any of the 18 monitoring wells south of Brown Street. This overall lack of dissolved phase hydrocarbons south of Brown Street is due to several factors including: the release was heating oil, which is not a highly mobile product type, particularly when weathered in the subsurface over two decades; there are no mobile LPH remaining in the subsurface; the pump and treat system is providing hydraulic control; and there is natural attenuation occurring.

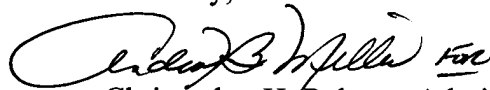
Of the 46 wells at the site, 18 are located south of Brown Street between the residual LPH and the Town's active supply wells. In the Hospital's revised proposal, none of the wells south of Brown Street will be used for the surfactant treatment with the exception of MW-20, which is within the area of hydraulic control from the pump and treat system. Eleven of the wells south of Brown Street will be sampled on a monthly basis to monitor any down gradient effects of the treatment process, and all wells will be sampled quarterly during and after the remediation activity. Additionally, the Department is requiring quarterly sampling efforts to include laboratory analysis for the presence of surfactants, and that the pump and treat system remain on, until the surfactants are no longer detected. The Department is comfortable with the monitoring well network and the monitoring plan during and after the treatments.

As discussed in the Department's March 25, 2014 letter to your attorney, the Hospital provided a series of maps, cross sections, drilling logs, well construction details, and other data (e.g. hydraulic conductivities), that together create a site conceptual model that the MDE management team refers to during its decision making processes. The Department has received all requested information and necessary site assessment to properly manage the oil cleanup at this site. At this stage in the site cleanup, the MDE does not need additional site assessment or a site conceptual model.

The Department's programs (i.e. the Oil Control Program, the Water Supply Program, and the Underground Injection Control Program) have been working in concert in reviewing the proposed remediation plan, and collectively agreed that the approval of the proposed plan will not pose a risk to the active water supply wells of the Town. The proposed plan will lead to the removal of a significant amount of residual petroleum from the source area, which will be a direct long term benefit in risk reduction to the Town's water supply.

Thank you again for meeting with us to discuss the plan in more detail. If you have any questions, please contact me at 410-537-3470 (email: chris.ralston@maryland.gov) or the case manager, Ms. Susan Bull, at 410-537-3499 (email: susan.bull@maryland.gov).

Sincerely,



Christopher H. Ralston, Administrator
Oil Control Program

Enclosure – Work Plan Summary

cc: Mr. Bill Ingersoll (Town of Chestertown)
Mr. Bob Sipes (Town of Chestertown)
Mr. Michael Forlini, Esquire (Funk & Bolton, PA)
Mr. John Beskid (Kent County Health Dept.)
Mr. Kenneth Kozel (Shore Regional Health)
Mr. Dane Bauer (H&B Solutions, LLC)
Mr. James Sines (EBA Engineering, Inc.)
Mr. Michael Powell, Esquire (Gordon-Feinblatt, LLC)
Mr. Horacio Tablada
Ms. Virginia Kearney
Dr. Ching-Tzone Tien, Ph. D, P.E.
Mr. Michael Eisner
Mr. Saeid Kasraei
Mr. John Grace
Ms. Priscilla Carroll, Esquire
Ms. Hilary Miller
Mr. Andrew B. Miller
Ms. Susan Bull

Work Plan Summary

Shore Regional Health – Chestertown

Relevant Documents

Pilot Test Evaluation Report and Proposed 2015 Action Plan – January 19, 2015

<http://mde.maryland.gov/programs/Land/OilControl/RemediationSites/Documents/KE%20Co%20-%20CRHC%20Pilot%20Test%20Eval%20and%20Proposed%202015%20Action%20Plan%201.19.15%20126%20pgs.pdf>

MDE comment letter – March 27, 2015

<http://mde.maryland.gov/programs/Land/OilControl/RemediationSites/Documents/KE%20Co%20-%20CRHC%20MDE%20Comments%20on%20Pilot%20Test%20Eval.%20Rpt%203.27.15%2008%20pgs.pdf>

Groundwater Remediation Proposed 2015 Action Plan – Response Letter – April 24, 2015

<http://mde.maryland.gov/programs/Land/OilControl/RemediationSites/Documents/KE%20Co%20-%20CRHC%20Proposed%202015%20AP%20Response%204.24.15%2019%20pgs.pdf>

Remediation Plan Summary

- The pump and treat system will remain on during the entirety of the remediation plan implementation. This will ensure that the current hydraulic controls remain in place as a backup to the aggressive Pull events.
- A 275-gallon mixture of 0.11% Ivey-sol (surfactant) and potable water will be injected into several wells identified in four Priority Zones and left to soak for 48 hours (Push events).
- Following that time, a pump will be used to extract liquids from the well (approximately 825 to 1,375 gallons) until there is no sign of surfactant presence remaining (Pull events).
- This process will be repeated at each well within Priority Zone 1 until TPH-DRO results are at or near laboratory detection limits. Once this milestone is achieved, the process will be repeated for each of the remaining Priority Zone wells.
- The plan predicts it will take three to six months to complete the remediation phase. The monitoring phase will take at least one year, and potentially longer, depending on the data collection (more below).
- None of the wells south of Brown Street will be used for the surfactant treatment, with the exception of MW-20 (discussed below).

- For MW-20, which is within the area of hydraulic control of the pump and treat system, only a 24-hour residence time will be allowed between the Push and the Pull events.
- Throughout the implementation of the plan, 11 of the wells south of Brown Street will be sampled on a monthly basis to monitor any down gradient effects of the treatment process, and all wells will be sampled quarterly during and after the remediation plan. There will be:
 - Monthly gauging of all monitoring and recovery wells.
 - Monthly sampling of eleven (11) targeted monitoring wells (MW-15, MW-16, MW-19, MW-20, MW-24, MW-33, MW-34, MW-35, MW-48, MW-49, and MW-50) for the presence of TPH-DRO (EPA Method 8015).
 - Quarterly sampling of all monitoring and recovery wells for the presence of TPH-DRO (EPA Method 8015), VOCs including oxygenates (EPA Method 8260B), and surfactants (EPA Method 5540D).
 - Monthly, all laboratory and field testing results that were performed during the implementation of the Priority Zones will be provided to MDE.
- Following implementation of the plan, the Department will require a minimum of one year post-remedial monitoring prior to determining case closure. This year would begin when it has been analytically demonstrated that all surfactant has been purged from the formation. The post-remedial monitoring may be extended pending review of the data. Further, the pump and treat system will be required to remain on until the surfactant has been removed fully and is no longer detected in the groundwater samples. The Department will issue written notice when the system may be turned off and the post-remedial monitoring period may begin.
- The pump and treat system will be used to process all recovered liquids during the plan implementation. The system was evaluated by both the professional engineer charged with running the system and the manufacturer of the filters to ensure the system can handle both the additional volume of impacted water and the mixture of surfactant and oil contaminants. The treatment system will be upgraded with additional filter media per the manufacturer's recommendations to ensure that the treated effluent meets the current National Pollution Discharge Elimination System (NPDES) permit requirements.
- The effluent from the treatment system will be sampled twice per month per the current NPDES permit requirements because of the additional flow.
- The Wastewater Permits Program, which implements the Underground Injection Control Program, has determined the proposed injection wells will be permitted by rule under its delegated authority from the US Environmental Protection Agency. No individual permit will be required.