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ENVIRONMENT & HEALTH

Mr. John Feeney
Wisconsin Department of Natural Resources
Plymouth Service Center
1155 N. Pilgrim Road
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WORK PLAN FOR ADDITIONAL OFF-SITE INVESTIGATION AND GROUNDWATER MONITORING ACTIVITIES PHILLIPS-MEDISIZE SITE, 600 SOUTH MILWAUKEE STREET, FREDONIA, WISCONSIN; BRRTS NO. 02-46-248387

Dear Mr. Feeney:

Ramboll Environ US Corporation (Ramboll Environ), on behalf of Phillips-Medisize Corporation (Phillips) has prepared this work plan for performance of additional off-site investigation and groundwater monitoring activities associated with the Phillips site located at 600 South Milwaukee Street in Fredonia, Wisconsin (the "site").

Based on the findings from the site investigation conducted to date and the documented chlorinated volatile organic compound (CVOC) impacts (specifically trichloroethene) above Wisconsin Administrative Code (WAC) NR 140 groundwater enforcement standards in the farthest off-site downgradient well (MW-17), additional off-site groundwater investigation is warranted. This work plan presents our additional investigation approach and outlines the associated scope of work and field methodology.

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ADDITIONAL INVESTIGATION APPROACH

To implement a timely and cost-effective method for determining the extent of the previously identified off-site groundwater impacts, groundwater samples will be collected from temporary hydropunch borings advanced to the groundwater table. The temporary hydropunch borings and related groundwater sampling will be performed within the Village of Fredonia street rights-of-way located downgradient and cross-gradient from MW-17. These hydropunch borings will be generally located along the west side of South Milwaukee Street, on Stoney Creek Court, Stoney Creek Lane, and the west end of Pine Street. The proposed locations of the hydropunch borings are illustrated on the attached Figure 1. Actual locations may vary depending on conditions encountered in the field.

The objective for the initial hydropunch groundwater investigation is to delineate the trichloroethene (TCE) groundwater impacts and determine the appropriate location for permanent (i.e., WAC NR 141) monitoring wells for future sampling and groundwater monitoring activities.

SCOPE OF WORK AND METHODOLOGY

The following outlines the scope of work and methodology that will be utilized during the additional site investigation and groundwater monitoring activities.

Hydropunch Groundwater Investigation/Sampling

A step-by-step sampling approach will tentatively include approximately 21 hydropunch borings installed at selected locations within the Village of Fredonia street right-of-way. Water samples collected from the hydropunch borings will be analyzed using an on-site mobile laboratory to provide daily sample results. The turnaround time for priority samples from any single sample will be reported in about 2 hours with all the daily analyzed samples (up to the laboratory capacity) reported by 9:00 AM the following day. The results will be evaluated in the field to determine subsequent hydropunch locations and as such, the number of sample points may change. The mobile laboratory will have sufficient instrumentation/capacity to analyze 15 to 20 groundwater samples per day for target CVOCs using United States Environmental Protection Agency (USEPA) Method 8260. Further detail regarding the mobile laboratory and target CVOCs analyses is discussed below. The mobile lab is National Environmental Laboratory Accreditation Program (NELAC) certified.

The hydropunch groundwater investigation will begin with the borings located along South Milwaukee Street and nearest to MW-17. After the laboratory reports from the samples collected along Milwaukee Street are reviewed, subsequent hydropunch borings will be performed in a step-wise fashion continuing along Milwaukee Street and then onto Stoney Creek Court, Stoney Creek Lane, and the west end of Pine Street. Subsequent hydropunch samples will be installed along these streets until the laboratory results indicate that CVOCs are defined in the down-and side-gradient direction from MW-17. The hydropunch borings will be installed to a depth of approximately 5 to 10 feet into the groundwater table (approximately 25 feet below ground surface [bgs]). The proposed locations of the hydropunch borings are illustrated on the attached Figure 1. The hydropunch borings will be logged to document the subsurface geology and determine the elevation where groundwater is first encountered at each required sampling location. Up to five hydropunch boring locations will be selected for additional vertical profiling to understand the geology and constituents of concern in groundwater. These additional deep hydropunch borings are anticipated to be installed approximately 5 feet into the underlying silt/clay unit beneath the sand stratum or to a depth of approximately 60 feet bgs if the underlying silt/clay unit is not encountered, with additional groundwater samples collected at approximate 10-foot vertical intervals at each location.

Soil samples will be continuously collected from the hydropunch borings for visual observation and field screening. Soil samples will be screened in the field with a photoionization detector (PID) for the presence of CVOCs. Soil characteristics (e.g., texture, color), PID readings, and visual and/or olfactory evidence of impacts will be recorded on soil boring logs. Laboratory analysis of soil samples is not planned at this time.

Upon encountering the groundwater, the borehole will be advanced approximately 5 to 10 feet into the water-bearing zone. Upon reaching the required sampling depth, a temporary sampling screen will be inserted into the boring and the rods retracted to expose the screen to the natural formation. The temporary well screen will be purged with a bailer or inertial sampling apparatus until the water is clear and free of sediment or the borehole is purged dry two times. Following purging activities, a water sample will be collected with the bailer or inertial sampling apparatus for mobile laboratory analysis by Pace Analytical Services, Inc. (Pace), a Wisconsin Certified Laboratory. All groundwater samples will be analyzed by the mobile laboratory for target CVOC analysis including: TCE, cis 1,2-dichloroethene (cis 1,2-DCE), trans-1,2-dichloroethene (trans 1,2-DCE), tetrachloroethene, vinyl chloride, 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane, 1,1-dichloroethane, and 1,2-dichloroethane using USEPA Method 8260B. The results from the mobile lab analysis will be used to assist in determining the optimal location for permanent monitoring wells to be installed.

Upon completion of the groundwater hydropunch sampling activities, the coordinates of each hydropunch boring will be recorded using a portable GPS (Trimble GeoHT®) to confirm the boring locations and to aid in the evaluation of the site geology and hydrogeology. The elevation of the ground surface at each hydropunch will also be surveyed to record the vertical elevation to within 0.10 feet using the established site benchmark.

Following completion of the hydropunch groundwater investigation, the data will be reduced and presented in a technical memorandum. The required Wisconsin Department of Natural Resources (WDNR) borehole logging, abandonment, and sampling forms will also be completed for future submittal to the WDNR. The laboratory data will also be reviewed to assure all quality assurance and quality control measures have been met. The technical memorandum will include a recommendation for installation of permanent monitoring wells, including number and location.

Permanent Well Installation

The first phase of the investigation will include the evaluation of the hydropunch data. This evaluation will then be used to determine if additional monitoring wells which will be installed during a subsequent phase of the investigation.

It is estimated that WAC NR 141 groundwater monitoring wells will be installed at locations on the Village right-of-way based on the results of the hydropunch groundwater investigation described above. The groundwater table is anticipated to be approximately 20 feet bgs along South Milwaukee Street adjacent to MW-17 and approximately 8 feet bgs on the west end of Stoney Creek Court; thus, the monitoring wells will be installed to depths ranging from 25 to 30 feet bgs and 13 to 18 feet bgs, respectively, depending upon their location. The wells will be constructed using 2-inch diameter, flush thread Schedule 40 polyvinyl chloride (PVC) riser pipe, and 10 feet of 2-inch diameter PVC factory cut (0.010-inch) slotted well screen, and will be completed using flush-mounted groundwater monitoring well compartments. Coarse silica filter sand packs will be placed from the bottom of the borehole to 1 to 2 feet above the top of each well screen. Following placement of the coarse sand pack, 1 to 2 feet of fine sand pack will be placed, followed by bentonite chips or slurry to ground surface. Well-head completion will include a flush mount cover and locking well cap.

The newly-installed groundwater monitoring wells will be developed in accordance with WAC NR 141 to remove residual materials remaining in the wells after installation and to re-establish the natural hydraulic flow conditions of the formations, which may have been disturbed by the well construction. Monitoring well construction details and well development forms will be completed for submittal to the WDNR.

Upon completion of the off-site groundwater monitoring well installation activities, the location of each groundwater monitoring well will be surveyed. The location and top of casing elevations of the new monitoring wells will be surveyed to vertical accuracies of 0.01 feet to aid in the determination of groundwater flow direction and assessment of groundwater contaminant movement and distribution. The site map will also be updated to identify the property boundaries and locations where samples were collected. These data will be integrated with the existing site survey data and site maps from the previous site investigation work.

Groundwater Sampling and Monitoring

Prior to beginning the hydropunch sampling activities described above, a groundwater sampling event has been conducted to aid with final placement of hydropunch locations. All groundwater monitoring wells at the

site were sampled for the target CVOC analytes including: TCE, cis 1,2-dichloroethene (cis 1,2-DCE), trans-1,2-dichloroethene (trans 1,2-DCE), tetrachloroethene, vinyl chloride, 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane, 1,1-dichloroethane, and 1,2-dichloroethane. The groundwater samples were submitted to Pace for CVOC analysis using SW-846 Method 8260B. Groundwater monitoring from all monitoring wells will occur on a quarterly basis for 1 year, starting after installation of the new permanent monitoring wells discussed above.

Groundwater samples will be obtained from the newly installed wells along with 15 selected existing monitoring wells (MW-1, MW-3, MW-6, MW-7, MW-8, MW-9, MW-12, MW-13, MW-15, MW-17, MW-18, MW-A, MW-B, PZ-2, and PZ-3). The initial samples collected from the new wells will be submitted for full VOC analysis (SW-846 Method 8260B) as required by the WDNR. All other samples will be submitted for laboratory analysis of the target CVOC compounds including: TCE, cis 1,2-dichloroethene (cis 1,2-DCE), trans-1,2-dichloroethene (trans 1,2-DCE), tetrachloroethene, vinyl chloride, 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichloroethane, 1,1-dichloroethane, and 1,2-dichloroethane using SW-846 Method 8260B. Subsequent sampling of the new wells along with the existing wells will be analyzed for the target CVOC compounds only. Field parameters including dissolved oxygen (DO), pH, specific conductance, and oxidation reduction potential (ORP) will be measured at each well and recorded. Two duplicates and one trip blank sample will be collected and tested for quality control/quality assurance. Results will be available within a standard laboratory turnaround time of 15 business days. Samples will be collected on a quarterly basis with sampling being conducted in accordance with pre-established groundwater sampling protocols (low-flow techniques) and methodologies. Water level elevations will be recorded at all site monitoring wells during each quarterly sampling round to evaluate groundwater flow direction and gradients.

Investigative Waste Management

Excess soil generated during the hydropunch investigation and installation of monitoring wells and purge water generated during each groundwater sampling event will be placed into 55-gallon drums, labelled, and temporarily staged on the Phillips site until appropriate disposal methods are determined. Purge water generated during each sampling event will be sampled and the results will be sent to the Village of Fredonia for approval to directly dispose the water into the sanitary sewer system under the existing monitoring well purge water disposal permit.

Reporting

The subsurface investigation findings and permanent well installation activities will be documented in an updated Site Investigation Report. The report will present the analytical results/findings of the groundwater samples collected from each of the hydropunch borings, the baseline groundwater sampling round, and the groundwater sample results from the new monitoring wells installed at the site. The report will also include an interpretation of the analytical data and recommendations for changes to the current quarterly monitoring well sampling locations if necessary. The updated Site Investigation Report will be submitted to the WDNR within 60 days after completing the field investigation and receipt of analytical data.

A brief groundwater monitoring summary report will be prepared following completion of the 4 quarters of groundwater sampling. The report will include tables, figures and plots of concentrations versus time for key parameters and ground water flow direction. Routine WDNR reporting consisting of semi-annual on-line reports and periodic data submittals will also be completed during this monitoring period as required by the WDNR.

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SCHEDULE

Permits will be secured with the Village of Fredonia prior to performance of the hydropunch investigation activities. It is anticipated that the field activities will commence during the first week in November 2017, beginning with the hydropunch groundwater investigation during the week of November 6, 2017. Following receipt of the baseline groundwater sample and hydropunch data, the permanent groundwater monitoring well locations will be identified and installed. Laboratory data from the investigation will be provided to the WDNR within 10 days of receipt of the analytical reports by the laboratory in accordance with WAC NR 716. The updated Site Investigation Report will be submitted to the WDNR within 60 days after completing the field investigation and receipt of the analytical data. The groundwater sampling will be conducted on a quarterly basis starting after installation of the new permanent monitoring wells.

On behalf of Phillips, we appreciate your continued assistance on this project. If you have any questions, please feel free to contact us.

Yours sincerely,

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FIGURE 1

PROPOSED HYDROPUNCH BORING LOCATIONS

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DRAFTED BY: NCB

DATE: 10/27/2017

Proposed Hydropunch Locations

Village of Fredonia Rights of Way

Fredonia, Wisconsin

FIGURE

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