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WORK PLAN
SUPPLEMENTAL
HYDROGEOLOGIC INVESTIGATION
OF THE GENERAL ELECTRIC CO.
FORT EDWARD FACILITY
FORT EDWARD, N.Y.

Prepared for:

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Fort Edward, New York

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1.0 INTRODUCTION

1.1 Purpose and Objectives

The recent installation of monitoring well DGC-41 at the General Electric Fort Edward New York plant has indicated the presence of subsurface PCB oil in the southern portion of the plant property. As specified in the April 27, 1990 letter from Dr. William J. Vullo of General Electric to James Ludlam, P.E. of the NYSDEC Bureau of Eastern Remedial Action, General Electric has notified the department that a plan for investigating the extent of oil in the subsurface for NYSDEC review and approval was forthcoming. The purpose of the investigation is to determine the extent of oil in the subsurface. The objective of this work plan is to outline the activities to be performed as part of the assessment.

1.2 Scope of Work

The proposed scope of work at the site is based on DUNN's evaluation of the available data and concentrates on the following:

- Drilling and sampling of approximately eighteen soil borings; collection of subsurface split barrel soil samples;
- Based on results of test borings, installation of two to five observation wells at the base of the shallow sand unit;
- Surveying of well DGC-41 and each new soil boring and/or well location;
- Data evaluation and report preparation.

2.0 METHODOLOGY

2.1 Hydrogeologic Investigation

2.2.1 Drilling Methodology

The objectives of the soil boring and monitoring well installation program are as follows:

1. to refine the depth and ultimately the elevation of the top of the low permeability clay unit underlying the surficial sand unit;

2. determine the extent of PCB oil, currently being recovered from monitoring well GM-27, and recently identified in monitoring well DGC-41; and

3. to provide data to determine the geologic and hydrologic conditions in the study area.

All soil borings will be advanced using a truck-mounted hollow-stem auger drilling rig. All borings will be advanced approximately 20 to 25 feet through the surficial sand unit to identify the top of the underlying low permeability clay unit. Narrow diameter (2 3/4- or 3 1/4-inch I.D.) hollow-stem augers will be used to advance soil borings which are not planned to be converted to monitoring wells. After performing initial soil borings to collect subsurface data (i.e., elevation of the clay unit and presence or absence of PCB oil at the base of the surficial sand unit) and, approximately two (2) to five (5) soil borings will be advanced using 4 1/4-inch I.D. hollow-stem augers for construction of monitoring wells at selected locations. Monitoring wells will be installed at locations where PCB oil is present or at locations of low elevations of the top of the clay, which may represent migration pathways.

Soil samples will be collected using the split-barrel sampling technique with standard sampling intervals (i.e., every 5 feet) in the first 10 feet and continuous sampling below 10 feet in each boring. If soil borings are performed in the immediate vicinity (within 10-15 feet) of a previous soil boring, then no sampling will be conducted from 0 to 15 feet and continuous sampling will be conducted from 15 feet to the top of the clay unit. All drilling activities will be supervised by a qualified Dunn Geoscience hydrogeologist. Soil boring logs will be prepared using the Modified Burmister and Unified Soil

Classifications. Particular attention will be made to record any evidence of visible oil in split-barrel samples and the depth to the clay unit.

Depending upon the results of the subsurface investigation, it is anticipated that approximately eighteen soil borings will be drilled. Objectives that will affect the number of borings that will be considered sufficient include determination of the extent of the PCB oil identified at monitoring wells DGC-41 and GM-27. Additionally, adequate resolution of the three-dimensional surface of the top of the low permeability clay unit (which is a controlling factor for dense PCB oil migration) is the second objective that will dictate the number of soil borings. The elevation of the top of the clay unit at each boring location will be surveyed within approximately 0.25 feet using leveling techniques with an established reference point immediately following each boring. This real time turnaround of elevation data will be useful in selecting additional soil boring locations, as necessary.

In the vicinity of GM-27 five to seven (5 to 7) soil borings will be performed to determine the extent of PCB oil currently being recovered from GM-27. In the vicinity of DGC-41 approximately twelve (12) soil borings are planned, including four borings along the south side of Park Avenue and approximately eight borings in the areas northwest and northeast of DGC-41 within a currently poorly-defined trough on the upper surface of the clay unit. A qualified and experienced DUNN hydrogeologist will be on site and will supervise the field drilling program at all times. The on-site hydrogeologist will be responsible for correct well construction, following health and safety guidelines, logging all soil borings and overall implementation of the work plan.

Soil borings not converted to monitoring wells will be backfilled with cuttings and grouted to the surface using cement-bentonite grout. Plastic sheeting will be placed on the ground for the temporary holding of cuttings. If PCB oil is visible in soil samples, then soil cuttings from the base of the borehole up to 5 feet above the sample with visible PCB oil will be collected in 55-gallon drums for testing and proper disposal.

2.1.2 Monitoring Well Installation

Based upon the results of the soil boring program, up to five (5) locations will be selected for installation of monitoring wells using 4 1/4-inch I.D. hollow-stem augers. All monitoring wells will be constructed of 2-inch teflon taped, threaded flush joint, Schedule

40 PVC pipe with 5 to 10 feet of slotted PVC well screen. Monitoring wells will be constructed and lowered down into the borehole. Monitoring wells will range between 20 to 25 feet in depth, depending on the depth to the clay unit. The proposed monitoring wells will be constructed with 5 to 10 feet of .020-inch slot screen with the base of the screen set slightly (1-2 inches) below the top of the clay unit. The annular space around and approximately 2 feet above the screen will be filled with a clean filter pack material graded for the slot size of the well screen used. A 3-foot bentonite seal will be further installed above the sand pack and will be prehydrated prior to grouting. The remainder of the borehole will be cement-bentonite grouted to the surface. A lockable protective casing will be cemented over each well to prevent unauthorized access and provide protection for the wells. The well identification number will be clearly labeled on the outside of each protective casing. Flush-mounted (i.e., curb-box) protective casings will be installed in areas subject to motor vehicle traffic.

2.1.3 Decontamination Procedures

Prior to drilling the first boring and between each subsequent boring, the equipment to be used in drilling and monitoring well installation will be cleaned to remove possible contaminants encountered during mobilization to the site. All equipment, which is to come in contact with the soil or rock, as well as water tanks, drill tools, pumps and hoses will undergo the initial cleaning procedure. Decontamination will take place adjacent to the waste water treatment system, approximately 100 feet west of monitoring well GM-22. A temporary basin consisting of plastic sheeting with 6-inch sidewalls will be constructed around a manhole for collection of discharge into the water treatment system. The cleaning process will involve the use of a steam cleaner or high pressure hot water. Potable water from the facility will be used for all decontamination procedures.

2.1.4 Well Development

All newly-installed monitoring wells will be developed using either overpumping with a suction-lift pump or bailing. Well development is necessary for the following reasons.

- to remove residual, formational silts and clays, thereby reducing turbidity during sampling, and,

- to increase the hydraulic conductivity immediately around the well which, in turn, reduces the potential of the well yielding an insufficient volume of water during the sampling procedure.

The overpumping method develops the monitoring well through a combination of surging and pumping at relatively high rates. Overpumping causes groundwater to pass through the sand pack, removing fine-grained material entering the well through the screen.

Overpumping may be used in combination with hand bailing. The bailers will serve both as a surge-block device loosening the fine-grained material from the well annulus, and as a mechanism to remove the water and sediment from the well. The surging is accomplished by rapidly raising and lowering the bailer within the screened section. Bailing or pumping will be continued until the water has sufficiently cleared or five well volumes of water have been removed. Development water will be collected and discharged into the onsite water treatment system.

2.1.5 Water Level Measurements

A minimum of two full rounds of groundwater level measurements will be obtained during the course of the investigation. Measurements will be obtained utilizing a chalked steel tape or electric water-level indicator. The same method and equipment will be used for all water-level measurements. All water level measuring equipment will be rinsed with deionized water between uses to prevent cross-contamination. Water level measurements will be obtained from all of the newly-installed monitoring wells as well as the pre-existing monitoring wells.

2.1.6 Monitoring Well Surveying

As described in Section 2.1.1, Drilling Methodology, the elevation of the ground surface at each soil boring location will be surveyed immediately following completion of the boring so that the depth to the top of the clay unit can be converted to an elevation value that will be useful for selecting additional boring locations. This real-time surveying of the soil boring locations will be conducted using leveling techniques with a reference point of known elevation. The ground surface at each soil boring location will be surveyed within approximately 0.25 feet. This accuracy will be sufficient for the objectives of the drilling program.

Following completion of the drilling program, a more accurate survey will be conducted. A site datum will be used to determine ground level and top of riser elevations to 0.01 foot at each well installed. The survey will be tied-into the previously used site datum so that the elevation data for the new soil borings and monitoring wells will be compatible with the elevation data from the previous site work. Additionally, the wells will be located in relative position to existing ground features such as paved roads, permanent structures, bench marks and property lines. A base map will be prepared to adequately represent buildings, roads, well locations and other pertinent features. A groundwater contour map and a top of clay elevation contour map will be prepared using the base map.

2.2.7 Sampling

Following installation and development of new wells, each will be sampled to document the presence, if any, of PCB oil in the subsurface. Any oil phase detected will be sampled and analyzed for PCBs. Prior to any sample collection, static water levels will be measured to the nearest one-hundredth of a foot. Then, a clear PVC bailer will be lowered to the bottom of the well. The clear bailer will be raised using a consistent and smooth manner to ensure that the bottom check-valve remains closed. The thickness of visible PCB oil in the bailer, if any, will be measured and recorded along with the depth of the sump (i.e., unslotted PVC beneath the slotted screen) for that well according to the well completion log.

All sampling will be performed by experienced DUNN or General Electric hydrogeologists and chemists. Any samples collected will be transported using chain-of-custody protocol to the General Electric Company Laboratories at Fort Edward, New York for analysis. Observations will be made and recorded regarding weather and surrounding air/water/soil conditions, depth of sampling, method of purging and amount, non-aqueous components of well water (e.g., oil sheens) and any other pertinent field conditions. Sampling logs will be completed for each well sampled and included in the final report.

3.0 DATA EVALUATION AND REPORT PREPARATION

Data evaluation and report preparation will consist of compilation, integration and evaluation of information collected during the hydrogeologic investigation. Data evaluation will be conducted continuously during the field investigation with the most intensive efforts concentrated during the drilling and the receipt of the laboratory water quality results. The results of soil boring, water level data and laboratory tests will be integrated to develop an understanding of the site hydrogeology, groundwater flow system and potential contaminant pathways and migration at the site. A final report will be prepared and submitted to the New York Department of Environmental Conservation for review and comment. The report will document all investigation activities and will discuss the rationale and methods of study for each phase of the investigation. The report will include all new data, data analysis and calculations, methodology, water-quality results, a surveyed map of the site including locations and elevations of all wells, water table contour maps, top of clay contour map, chain-of-custody documentation as well as any field notes. Data gaps, if any, will be identified in the report and conclusions clearly and concisely detailed. If warranted, recommendations for additional work will be outlined.

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