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LETTER REGARDING SOUTH CAROLINA DEPARTMENT OF HEALTH AND
ENVIRONMENTAL CONTROL REVIEW OF DRAFT RCRA FACILITIES INVESTIGATION (RFI)
WORK PLAN AND SITE SAFETY PLAN DATED APRIL 1988 FOR DRMO CNC CHARLESTON
SC
06/01/1988
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

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South Carolina Department of Health and Environmental Control

2600 Bull Street
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MEMORANDUM

TO: Randy Thompson, Engineer
Division of Facility Engineering
Bureau of Solid and Hazardous Waste Management

FROM: Paul L. Bristol, Hydrologist *P.L.B.*
Division of Hydrogeology
Bureau of Solid and Hazardous Waste Management

DATE: June 1, 1988

RE: Charleston Naval Shipyard
SCO 170 022 560
Charleston County
Draft RCRA Facilities Investigation (RFI) Work Plan
and Site Safety Plan, dated April 1988

The referenced document is a proposal for the assessment of possible ground-water degradation associated with lead contaminated soils at the Defense Reutilization and Management Office (DRMO) site at the Charleston Naval Shipyard. Previous investigations at DRMO identified approximately six acres of contaminated soil (residual lead levels exceeding 1000 mg/kg) ascribable to storage of spent lead acid batteries in the materials storage area.

As presented to the Department, the objective of the work plan is to identify the potential risk to human health and the environment due to lead contamination potentially migrating from the site to ground water at the facility. Also, the results of this study will be utilized to determine the necessity for a corrective action program to remediate the contamination, as appropriate. The proposed work involves the emplacement of four (4) monitor wells and two piezometers with subsequent sampling of the monitor wells for specific constituent analysis. The scope of the work has been designed to provide the following:

1. Identify the existence and concentration of lead in the surficial aquifer at the site;
2. Evaluate the contaminant data from the field investigation to determine concentrations and distributions (where possible);

3. Evaluate the potential for contaminant migration based on hydrogeological data (water levels, gradients, etc.) obtained during the investigation.

Technical review of the referenced document generated several concerns regarding the adequacy of the proposed work to achieve the stated objectives and adequately characterize the extent and severity of ground-water degradation at the facility. A detailed description of the concerns are as follows:

1. Monitor wells CSY-1606-MW1, CSY-1606-MW2, CSY-1606-MW3 are intended to quantify the concentration and distribution of suspected contamination hydraulically downgradient of the source area (Salvage Bin No. 3). Although CSY-1606-MW3 appears to be located within the suspected contaminant plume and may quantify contamination in the immediate source area, CSY-1606-MW1 and CSY-1606-MW2 may be sufficiently distal from the source area as to lie beyond the extent of ground-water contamination. CSY-1606-MW1 and CSY-1606-MW2 are also in close proximity to the Cooper River and saturated zone hydraulic gradients may be sufficiently influenced by tidal action as to suppress the severity of ground-water degradation detected at these locations. Additionally, extensive soil contamination (> 1000 mg/kg residual lead) has been detected west and north of the Salvage Bin No. 3. The proposed work plan does not address ground-water monitoring for possible contamination ascribable to leachate formation in this area.
2. Two underground stormwater drainage systems (identified by Outfall #2 and #3) are emplaced in areas of contaminated soils (> 1000 mg/kg residual lead). These drainage systems represent areas for potential ground-water discharge due to higher permeabilities than the associated native soils. The current proposal does not provide to qualify these systems as possible conduits for preferential ground-water flow and contaminant migration pathways.
3. The work plan provides for one sampling event to quantify the concentration and distribution of contamination at the facility.

Due to the above concerns, the referenced document does not appear to provide for an adequate evaluation and characterization of any known, suspected, or apparent ground-water contaminant plume emanating from the solid waste management unit. In general, a more extensive and comprehensive scope of work should be

formulated to address these concerns. General recommendations regarding the information deemed necessary to characterize ground-water contamination are presented below:

4. Thoroughly define the horizontal boundaries of the contaminant plume, including identifying and quantifying areas of maximum contaminant concentrations within the plume. To provide this data, additional monitor wells are recommended as follows:
 - a. One well located within 100 feet east of CSY-1606-MW3;
 - b. One well located at or near the junction of Avenue A North and "Rock" Road;
 - c. One well located north northwest of CSY-1606-MW3 (within the 10,000 mg/kg soil isopleth).
5. Thoroughly define the vertical distribution of the contaminant plume, including identifying the full extent of vertical contaminant migration and quantifying contaminant(s) concentration in the subsurface profile. To provide this information, clustered monitor wells are recommended as follows:
 - a. Clustered well located at CSY-1606-MW3.
 - b. Clustered well located at or near the junction of Avenue A North and "Rock" Road.
6. Thoroughly define ground-water flow paths and rates, including identifying ground-water flow directions (including both horizontal and vertical components of flow) and which accounts for seasonal and/or temporally induced variations in ground-water flow directions, identifying hydraulic conductivities of the significant hydrogeologic units beneath the site, and identify zones of suspected high permeabilities or structures likely to influence contaminant migration through the saturated and unsaturated zones (e.g. solution channels, cross-cutting structures, underground conduits, etc.). An additional monitor well will need to be installed along Sixth Street North to quantify the storm sewer system in this area as a potential ground-water discharge point.
7. Provide a sampling and analysis program which will produce reliable determination of ground water quality beneath the site. Due to the possible influence that tidal forces may impose on ground-water quality and hydraulic gradients at the DRMO, sampling frequencies will need to be enhanced to account for this temporally induced variation. In addition, a more comprehensive

list of analytical parameters should be developed to include constituents which may be associated with lead acid batteries and additional indicator parameters, (e.g. cadmium, sulfates, chlorides, etc.).

Based on the above requirements and recommendations contained therein, the facility should revise the proposed RFI Work Plan to provide a more comprehensive approach for the evaluation of suspected ground-water contamination at the referenced facility. The revised plan will need to provide schedules for implementation and anticipated completion dates for the proposed activities.

If you have any questions regarding the above comments please contact the writer at 734-5349.

cc: EPA Region IV