09/30/91 03:01 PM P01

9/30/91-02090

COMMONWEALTH of VIRGINIA

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September 30, 1991

Ms. Brenda Norton
Naval Weapons Station Yorktown
Atlantic Division Naval Facilities
Engineering Command
Code 1822
Norfolk, VA 23511-6287

Dear Ms. Brenda Norton:

We have reviewed the Work/Sample Plan for the site inspection of Site 21--the Battery and Drum Disposal Area--at the Naval Weapons Station and have several comments.

The work plan proposes testing soil and ground water for priority pollutant metals. We recommend testing instead for the EPA Superfund's Target Analyte List (TAL). This is the list of metals routinely included in investigations done under CERCLA.

The EPA contract laboratory program's contract-required detection limits for some compounds on the target analyte list are considerably higher than levels that can have an adverse effect on aquatic life. These compounds include cadmium, copper, lead, mercury, nickel (for saltwater organisms), silver, and cyanide. The analytical method for these compounds should have a level of detection that at least approaches the appropriate EPA chronic criterion for aquatic life.

Metals analysis of ground water should be done on both unfiltered and filtered samples. (We understand that you are planning this.)

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Since there is apparently no information on contents of the drums disposed of at the site, we feel that the SI should include testing for pesticides.

Concerning monitoring well construction discussed in Section 4.2.1.7, the filter pack proposed is # 2 Virginia Sand. We are not familiar with this classification. It would be helpful if the work plan provided more specific information about the size of the material to be used. We assume the sand is larger than the proposed screen size. According to the report, the minimum thickness of the bentonite seal will be one foot. It should be a minimum of two feet. We recommend that a concrete apron with a radius of at least 3 feet and a minimum thickness of 4 inches be placed around the well casing. Boring log sheets and well construction logs should be kept. Information that should be included in the boring log is found in Table 1 - 3 of "RCRA Ground-Water Monitoring Technical Enforcement Guidance Document" a copy of which is attached. Information that should be included on well construction is found in section 3.5 of the guidance document which is attached.

We cannot tell exactly where the proposed wells are in relation to the areas of waste disposal that we saw at this site in August, so we are not sure of the location of well MW-2. It should be placed so that it would detect any groundwater contamination from the area of concentrated battery disposal.

The work plan mentions that a bulldozer will be used to clear any areas prior to drilling activities. The batteries and old drums should be disturbed as little as possible during well installation so any bulldozing should be done very carefully. Has the installation considered removing the batteries before installing wells and testing soil? The discharge of hazardous substances to surface water and possibly groundwater seems likely here. Removing the potential source of contamination at this time might be worth considering.

The work plan states that four surface soil samples will be taken from locations to be determined in the field. No criteria for selecting the locations are included. We are interested in the location of these four soil samples and in having a better understanding of the well location in relation to wastes at the site and so request that we be present when the exact sites are selected.

Waste material disposed of at this site is exposed to the environment and is on a hillside located above a small stream in the Felgates Creek watershed. We feel it is likely that there could be a discharge of hazardous substances to surface water through rainfall runoff. Therefore we think that surface water and

sediment sampling of the stream at the foot of the hillside should be included in the site sampling program. We also feel that the surface water sampling program should be designed to sample the stream when the impact from runoff would be expected. Sample locations should include an upstream site (if possible), one that would be affected by runoff from the battery disposal area, and one downstream of the site.

We appreciate the opportunity to comment on the work/sampling plan. If you have any questions about our comments, please let us know.

Sincerely yours,

Anne M. Field
ARAR's Coordinator

/AMF

cc: K.C. Das

TABLE 1-1
FIELD BORING LOG INFORMATION

General

- Project name
- *Hole name/number
- *Date started and finished
- *Geologist's name
- *Driller's name
- Sheet number
- *Hole location; map and elevation
- *Rig type bit size/auger size
- *Petrologic lithologic classification scheme used (Wentworth, unified soil classification system)

Information Columns

- *Depth
- *Sample location/number
- Blow counts and advance rate
- *Percent sample recovery
- *Narrative description
- *Depth to saturation

Narrative Description

- Geologic Observations:
  - *- soil/rock type
  - *- color and stain
  - *- gross petrology
  - - friability
  - *- moisture content
  - *- degree of weathering
  - *- presence of carbonate
  - *- fractures
  - *- solution cavities
  - *- bedding
  - *- discontinuities; e.g., foliation
  - *- water-bearing zones
  - *- formational strike and dip
  - - fossils
  - *- depositional structures
  - *- organic content
  - *- odor
  - *- suspected contaminant
- Drilling Observations:
  - - loss of circulation
  - *- advance rates
  - - rig chatter
  - *- water levels
  - - amount of air used, air pressure
  - *- drilling difficulties
  - *- changes in drilling method or equipment
  - *- readings from detective equipment, if any
  - *- amount of water yield or loss during drilling at different depths
  - *- amounts and types of any liquids used
  - *- running sands
  - *- caving/hole stability
- Other Remarks:
  - - equipment failures
  - *- possible contamination
  - *- deviations from drilling plan
  - *- weather

*Indicates items that the owner/operator should record, at a minimum.

these cases, this water should be chemically analyzed to evaluate its potential impact on in-situ water quality. The driller should not have used air to develop the wells. All developing equipment should have been decontaminated prior to use as should have the materials of construction.

The owner/operator should have developed wells to be clay- and silt-free. If, after development of the well is complete, it continues to yield turbid ground-water samples, the owner/operator should follow the procedure described in Figure 3-4. The recommended acceptance/rejection value of five nephelometric turbidity units (N.T.U.) is based on the need to minimize biochemical activity and possible interference with ground-water sample quality. The same criteria applies to turbidity measurements expressed in other units such as the formazin turbidity unit (F.T.U.) or Jackson turbidity unit (J.T.U.).

One should determine the relative hydraulic conductivity of different layers within the aquifer in which the screen is placed (the transmissivity/pumping test method is recommended). Using this information along with pH, temperature measurements and mean seasonal flow rates, one should evaluate the initial performance of the well and use these values for periodic redevelopment and maintenance assessments.

3.5 Documentation of Well Design and Construction

In the context of a compliance order, the technical reviewer should require the owner/operator to compile information on the design and construction of wells. Such information may include:

- Date/time of construction
- Drilling method and drilling fluid used
- Well location (± 0.5 ft.)
- Bore hole diameter and well casing diameter
- Well depth (± 0.1 ft.)
- Drilling and lithologic logs
- Casing materials

- Screen materials and design
- Casing and screen joint type
- Screen slot size/length
- Filter pack material/size, grain analysis (D10)
- Filter pack volume calculations
- Filter pack placement method
- Sealant materials (percent bentonite)
- Sealant volume (lbs/gallon of cement)
- Sealant placement method
- Surface seal design/construction
- Well development procedure
- Type of protective well cap
- Ground surface elevation (± 0.01 ft.)
- Surveyor's pin elevation (± 0.01 ft.) on concrete apron
- Top of monitoring well casing elevation (± 0.01 ft.)
- Top of protective steel casing elevation (± 0.01 ft.)
- Detailed drawing of well (include dimensions)

3.6 Specialized Well Designs

There are two cases where owners/operators should use special monitoring well designs:

- Where the owner/operator has chosen to use dedicated pumps to draw ground-water samples; and
- Where light and/or dense-phase immiscibles may be present.

If the owner/operator elected to use a dedicated system, it should be a fluorocarbon resin or stainless steel bailer, or a dedicated positive gas displacement bladder pump composed of the same two materials. As other sampling devices that can perform at least equivalently become available, they may be employed as well.

The introduction of this pump, however, necessitates certain changes in the well cross section depicted in Figure 3-1. Figure 3-5 represents

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