

MEMORANDUM

To: James L. Colter, Remedial Project Manager
From: Alix J. Rauschman, Restoration Advisory Board
Date: December 5, 1996
**RE: Comments on the Phase II Remedial Investigation/Feasibility Study Work plan
for NASJRB Willow Grove, Pennsylvania.**

The following comments are designed to be constructive to the completion of sampling that is proposed at the NASJRB Willow Grove Naval Base. In general, I am pleased with the proposed sampling regime, however, I do have some suggestions which, due to my experience with work plan preparation, may lead to a more comprehensive study of the site. Some of the comments I make are not necessarily written for inclusion in the work plan document, but are to be used as guidance as the sampling is completed on the site.

Comment 1: 1.0 Introduction:

Considering the fact that this site has had both a Preliminary Assessment and Site Investigation on all study areas, I wonder whether this site was hazard ranked. Because of the site's location within two water sheds and proximity to potable drinking water wells and local residential areas, the site may score under the new revised hazardous ranking system.

Comment 2: Section 2.4 Soil Borings, Paragraph 2:

This section should designate to what depth the continuous sampling will occur. Samples are usually collected every two feet, and most sampling should be completed to bedrock or to groundwater, whichever is encountered first.

Comment 3: Section 2.9 Water-Level Studies, Sentence 1:

This sentence states that water-level studies will be conducted at two sites to investigate short- and long-term variations and trends in hydraulic head and so forth. This sentence should be rewritten to say:

Water-level studies will be conducted at the Privet Road Compound and the Ninth Street Landfills (see sections 3 and 5 respectively).

The second sentence should explain *why* these two locations were chosen for this study.

Comment 4: Sections 3.1, 4.1, 5.1, and 6.1:

In accordance with the information normally provided in the PA and SI reports, the site description should include what is directly north, south, east, and west of the particular site, and the maps (figures 3-1, 4-1, 5-1, and 6-1) should be a closeup of that area so that the reader, without having to visit the site, can get an appreciation for the study area is like in regards to adjacent buildings, nature areas, residential areas, etc.

Comment 5: Sections 3.5, 4.5, 5.5, and 6.5 Hydrogeology:

There seems to be a difference in the groundwater flow direction and hydraulic connectivity between the what has been discovered regionally and what is described in each hydrology sections of the text. It will be important to fully analyze the directional flow, speed, and continuity of flow underneath the base in order to determine the ecological impact of contaminant migration into the Pennypack and Neshaminy drainage basin areas, and the potential human health impacts of contaminant migration to potable drinking water wells utilized by local residents.

Comment 6: Sections 3.7.3, 4.7.3, 5.7.3, and 6.7.3, Remedial Investigation:

In the discussion of data findings should be a comparison of contaminant values to regulatory levels for industrial and residential soils and groundwater. Also in the discussion should be an evaluation of background data, its validity, and whether or not the original background locations were useful for the analysis of data. Thus far, there has been no comparison or indication of what regulatory levels are being compared against the data, or whether background levels encountered are valid based on these levels. Section 7 only discusses the soil and surface water/sediment samples that are being added to the scope of the work plan.

Comment 7: Sections 3.8.1, 4.8.1, 5.8.1, and 6.8.1, Sources and Release Mechanisms:

It is crucial for the completion of the risk assessment portion of the RI report to analyze contaminant migration pathways, and I am satisfied to see the beginning framework for this type of analysis in the Work plan. However, in order for a preliminary conceptual site plan to be effective to determine sampling locations, ALL potential migratory pathways need to be discussed, including point and non-point source from outside of the study area boundary. The sampling plan should include samples to be collected that would allow for the determination of how contamination may migrate to and from the AOC via surface runoff, particulate deposition, or groundwater migration.

Comment 8: Section 3.9 Data Limitations and Requirements:

The extent of the PCB "hot spot" should be diagramed in the Phase II RI report including width and depth of contamination.

Comment 9: Section 3.10.1 Soil Sampling:

Though it may be useful to take more samples in the immediate vicinity of soil sample B3 in order to better delineate the extent of this potential PCB "hot spot," a few more samples should also be taken in order to fully characterize the extent of contamination at this area. For example, one should be on the west side of the bowling alley towards the southwest corner of the building; another should be located due west of proposed sample B-23, two others should be southwest and southeast approximately 20 feet from B-22; and another east of sample location B-21 approximately 10 - 15 feet.

Sample B-1 and its data are not shown in figure 3-2.

Since groundwater in this area may flow in a northerly direction, groundwater location PRW-2 is a good location for a well, but possibly another well, located even further north of this area may be needed to further characterize groundwater flow in this area. Groundwater wells should be positioned to determine the potential for southeast and southwest groundwater flows, as encountered in other study areas underneath the site to determine whether groundwater in this location could impact groundwater down gradient.

Comment 10: Sections 3.10.1, 4.10.1, 5.10.1, and 6.10.1 Soil Sampling:

Sampling has not been performed since 1992, therefore, contaminants may have migrated further, and the only way to ascertain the downward leaching/migration of contaminants to groundwater is to analyze the whole soil column, in two foot intervals, from the surface to the approximated level of bedrock or groundwater, whichever comes first.

Comment 11: 3.10.3 Long-Term Water Level Study:

A one-month water level study, especially at this time of year where evaporation is minimal will not give an accurate account of water level fluctuations. I did my thesis partially on this topic and this study would be effective if studied from at least March until October of next year.

Comment 12: Section 3.10.5 Groundwater Sampling:

I suggest that in a site with various types of contamination, that a full priority pollutant scan of all samples be

taken.

Comment 13: Section 4.1 Description and History (The Antenna Field Landfill):

There is no indication as to whether or not the site has been properly closed thought it can be assumed it has not. Will this landfill be properly closed in the future?

Comment 14: Section 4.3 Hydrology:

Since this site slopes toward the southwest, there should be in the RI, a discussion about the potential off-site migration of contaminants and their potential impacts.

Comment 15: Section 4.4 Geology:

Due to the age of the on-site landfills at the Willow Grove Naval Base, it is fortunate that a clay layer may underlie the landfills. However, due to the potential downward migration of contaminants via hydraulically connected lenses within the regional soil infrastructure, there is a probability for groundwater contamination in this area. Though an exact determination of buried waste constituents is not necessary, the potential for leachate migration should be analyzed, especially when in section 4.5, Hydrogeology, it is stated that a perched water table rises into the waste. Also, the waste is buried within the Pennypack watershed, therefore, it is likely that contaminant migration has occurred in the past. Nowhere in this section or in the Ninth Street Landfill section is there proposed work for leachate collection and analysis.

Comment 16: Section 4.7.3 Remedial Investigation, Paragraph 2, last sentence:

It is presumptive to say that the "distribution patterns of the organics and inorganics [encountered in past investigations] are not indicative of a major source area at the site." Due to the landfill's down gradient location from the Ninth Street Landfill and the Fire Training Area, it is important to ascertain where the contributing source(s) of contamination originate from by analyzing potential migration pathways between these two northwestern sites and the landfill and again, from the landfill itself.

Comment 17: Section 4.10 Proposed Work:

Generally, the soil sampling regime looks good, however, since it is known that groundwater may travel either southeast or southwest, groundwater wells should be established along the east/southeast border of the intermittent stream that goes along the east/southeast border of the landfill. Another monitoring well would be useful southwest of the landfill northwest of ALW-1 in the vicinity of the southwest corner of the landfill. Possibly, another proposed sediment/surface water sample should be located in between SWS-2 and SWS-1.

Comment 18: Section 5.4 Geology (Ninth Street Landfill):

As stated above in comment 15, clay underlying the landfill is a positive geological phenomenon, however, the potential downward migration of contaminants should be examined here as should be done at the Antenna Field Landfill.

Comment 19: Section 5.10 Proposed Work:

Since groundwater has been noted to flow northeast, a monitoring well should be installed along the northeast corner of the landfill area, northeast of the wetland. Groundwater has also been documented to go northwest in some areas, along with southeast and southwest in others. Monitoring wells should be placed northwest of the wetland and southeast of TPI.

Comment 20: Section 6.3 Hydrology (Fire Training Area):

Since the ground surface slopes toward the south, and the drainage pattern which carries runoff from both the Fire Training Area and the Antenna Field Landfill drains to Pennypack Creek, the drainage pattern should be

sampled. It is uncertain in looking at the diagrams for the Antenna Field Landfill or the Fire Training Area, where these drainage pathways are located, for they are not labeled or distinguished on the figures. Pennypack Creek is not shown on these diagrams either and should at least be identified on the overall site diagrams, figures 5-1 and 6-1 which, as described in comment 4, should be specific to the particular area of concern mentioned.

Comment 21: Section 6.4: Hydrogeology:

Since groundwater flows southeast or southwest, and that the Antenna Field Landfill is southeast of the Fire Training Area, the potential groundwater contaminant migration pathway from the Fire Training Area to the landfill should be assessed.

Comment 22: Section 6.10 Proposed Work:

Due to the types of contaminants found on-site in past investigations, all priority pollutants should be analyzed for. VOCs probably have migrated off-site in one form or another, however, petroleum compounds especially, may be prominent in soil samples and sample depths should go to bedrock or groundwater, whichever is encountered first.

Comment 23: Section 7: Background Sampling:

Generally, the locations of the background samples look good, but a closeup would be helpful in case some samples may be located downstream or down gradient from contaminant migration pathways that may or may not have already been established.