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U S EPA REGION III COMMENTS ON THE DRAFT PHASE III REMEDIAL INVESTIGATION REPORT MEDIA OTHER THAN GROUNDWATER FOR NAWC WARMINSTER PA
11/25/1997
U S EPA REGION III PHILADELPHIA PA

130-7

ENCLOSURE 1 TO EPA LETTER OF NOVEMBER 25, 1997

EPA COMMENTS ON "DRAFT PHASE III REMEDIAL INVESTIGATION REPORT (MEDIA OTHER THAN GROUNDWATER)" FOR NAVAL AIR WARFARE CENTER - WARMINSTER, PA

4.0 AREA A

4.1 AREA A HISTORY AND DESCRIPTION

It should be noted that Sites 1, 2 and 3 were originally reported to have been used for disposal of CERCLA hazardous substances in a "Navy Shore Activity Disposal Site Fact Form" issued by NADC in December 4, 1980 (NADC(1980)). This document should be referenced in the text. It should also be noted that an "Aerial Photographic Site Analysis for the Naval Air Development Center Warminster PA" issued by EPA EPIC in May 1994 provided significant additional detail regarding reported Sites 1, 2 and 3 and identified other features of potential concern within Area A, including a series of eight wastewater impoundments.

In general, because the CERCLA investigations described in this report are primarily a response to the information reported in these two documents, additional relevant details in these documents should be reported in this section as described below.

4.1.1 Waste Burn Pit No.1 - Site 1

While the text indicates Site 1 was operated as a "burn pit" within an eroded ravine from approximately 1948 to 1950, NADC (1980) reported Site 1 operated from 1940 to 1955 and was located at the "severe embankment of a ravine found by erosion action of stream" where "material was dumped over the bank and burned." The disposed material reportedly included "paint, oil, asphalt, roofing material, solvents, scrap metal, chemicals and waste from firing ranges". NADC (1980) also reported this was "a disposal site for excess earth generated by grading for extension of aircraft runway".

Based on the above description of Site 1, the site should not be referred to as "Waste Burn Pit No.1". Instead, it is suggested this section simply be referred to as Site 1.

EPIC (1984) identified an apparent disposal site which met the subject description and operated from 1942 to 1950. Designated D1, this approximately one-half acre dump was located immediately adjacent to a tributary of Little Neshaminy Creek, which ran in a northerly direction off of Navy property. It should be noted that, in this report, dump D1 is considered as part of Site 2.

Figure 4-1 does not clearly indicate the location of D1. For example, D1 should be clearly distinguished from DG3. In addition, it is recommended Figure 4-1 not include an "area of investigation" and be limited to identification of potential disposal areas identified in EPIC (1994). Note that the dimensions of D1 and DG3 are different here relative to figures later in the report, e.g., Figure 4-11. The location of these features should be as depicted in EPIC (1994) and consistent throughout the report.

Another potential disposal site identified by EPIC(1994) in the reported area of "Site 1" was "an irregularly shaped pit or impoundment" adjacent to a series of eight rectangular-shaped impoundments associated with the industrial wastewater treatment plant. The irregularly shaped pit (P1) was approximately 100' X 35' in size and was apparently in place from 1948 to 1950. A ground scar (GS4) still appeared at the former location of P1 in 1958. In 1971, a trench (TR8) of approximately 200 feet in length extended over the location of the former Pit P1 and by 1973, this trench had been replaced by a slightly larger area of disturbed ground (D2) approximately 225' X 45' in size. With regard to the eight rectangular-shaped industrial wastewater impoundments, one aerial photo (1965) indicated a breach in an impoundment and associated soil staining extending toward the property boundary.

4.1.2 Sludge Disposal Pit - Site 2

Note that some of the site description language early in this section is duplicated.

Given the site is reported as two trenches, the site should not be referred to "sludge disposal pit". Again, it is suggested the site and section be titled "Site 2".

Indicate NADC (1980) reported the disposal of 1400 cubic yards of industrial wastewater sludge at this site.

Note that EPIC (1994) identified only one feature which fit the description of the two 200' X 12' trenches reportedly used for disposal of industrial wastewater sludge between 1965 and 1970 in Area A. This feature was trench TR8 (discussed above). EPIC (1995) identified another possible trench of similar dimensions (POSS TR2), but this feature appeared in 1958.

It is indicated that TR2 (as well as the referenced TR1 and mounded material MM1) are believed to be related to the installation of a stormwater drain at these locations and that this conclusion is supported by subsurface investigations. However, it does not appear appropriate to discuss the results of unspecified investigations at this point.

It is worth noting that the other potential disposal sites identified by EPIC (1994) in this area did not appear to fit the description of sites reported in NADC (1980) and that part of a large area of disturbed ground (DG3) which appeared in 1973 overlapped with a significant portion of D1, which was active only up to 1950.

The text notes that a "fuel storage area includes a gas station with gasoline and diesel fuel USTs, four 15,000 gallon JP-5 USTs, as well as a storage building". The location of each of these features should be indicated on Figure 4-1. The statement that "no releases are known to have occurred in this area" should be deleted. RI data indicates that both CERCLA hazardous substances and petroleum products have been released to groundwater north (and downgradient of) the referenced features. In addition, PCE in groundwater should not be described as "localized".

The referenced "fuel storage area" should also be indicated to include "Tank 18", which was briefly permitted under RCRA for storage of waste oils and used solvents. To date, the investigation of potential hazardous substance releases from this unit have not been reported in any document in the public record. This report could be a means to report the information necessary to meet the substantive requirements of RCRA and/or CERCLA for Tank #18.

While the Phase III RI Workplan is mentioned, this document is not included in the list of references. Please include. This section also references a "surface disposal area (SDA)" but does not provide a map of this area or information to support the delineation of such an area. To avoid confusion, it is suggested that reference to the "SDA" be deleted.

4.1.3 Waste Burn Pit No. 3 - Site 3

Again, note that site description language in this section is duplicated.

4.1.4 Former Impoundment Area

Note the sludges stored in these impoundments were generated by the industrial waste water treatment plant.

While the lagoons are reported as "clean-closed", there is no definition provided for "clean-closed" and no information provided to support this statement. Also, it is inappropriate to draw this conclusion prior to evaluating RI results discussed later in this report.

According to NADC (1980), the industrial wastewater sludges were disposed at Sites 2 and 6. Site 4 reportedly received only "domestic waste sludge".

4.1.5 Former Farmhouse and Supporting Structures - Zone B

No comments are provided at this time.

4.2 SUMMARY OF PREVIOUS INVESTIGATIONS

Note that a significant number of exploratory soil borings were conducted as part of the Phase I RI. This work should be acknowledged and the results discussed. Note that, generally, samples were not collected from these borings and that the primary purpose was to record visual observations and conduct PID readings. Significant PID readings and observations of potential industrial waste material should be discussed.

All of the studies discussed in this section should be referenced and included in the list of references.

4.2.1 Site 1

Note the number of borings conducted in 1980 and that, based on available information, the actual locations of these boring were unclear. Rather than 2.8 to 78 mg/kg, the levels detected were 2.8 to 78 ug/kg.

4.2.4 Previous Groundwater Investigations

Note that the referenced HNUS (1995c) was never finalized and is not included in the list of references. It is recommended that this document not be referenced. It is indicated that the majority of organic contamination appears to be immediately north of the former impoundment area, near Site 1. However, the highest concentrations of PCE occur in groundwater north of fuel storage area, not the impoundment area.

It is indicated that "groundwater within and downgradient of Area A does not appear to have been impacted by releases of inorganics at the base". This statement is apparently inconsistent with the interim ROD for Area A groundwater issued in September 1993, which found that MCLs have been exceeded for cadmium, manganese, nickel, arsenic and barium in individual groundwater samples collected within Area A and that arsenic, thallium and barium concentrations are primary contributors to an unacceptable noncarcinogenic risk associated with Area A groundwater.

Please identify the well cluster where the highest levels of inorganics were detected.

4.3 REMEDIAL INVESTIGATIONS

4.3.1 Electromagnetic (EM) Survey

Documents which describe the scope of work performed and the specific procedures followed should be identified and included in the list of references.

4.3.2 Soil Gas Survey

Again, documents identifying the scope of work to be performed and specific procedures should be identified/referenced.

4.3.3 Surface Water/Sediment Sampling

Comments to be submitted at a later date.

4.3.4 Surface Soil Sampling

The dates of surface soil sample collection should be identified and a discussion included regarding construction activities which have affected the nature of surface soils in this area, i.e., placement of road or fill material during construction of groundwater treatment plant and associated piping, etc.

The range of sample depths should be identified.

The basis for surface soil sample locations should be identified.

There are two sample locations identified as SS-01-01 in Figure 4-6.

4.3.4.2 Site 2

Again, recommend deleting the reference to the surface disposal area (SDA).

4.3.5 Subsurface Soil Sampling

The first paragraph describes the nature of pre-Phase III RI work. This was done previously and would not appear to belong here.

In the first paragraph, the reference to test pit and boring logs appears to belong later in this section.

Generally, each sub-section in this section should identify the range of boring and test pit depths, the range of sample depths, and the basis for sample depths selected.

This section should note the basis for the analytical parameters selected for a particular sample.

The last sentence in this section provides detail which would best be included in followup sections.

While the figures clearly indicate which samples were collected in response to features identified by EPIC, it is not possible to distinguish which samples were collected to investigate geophysical or soil gas anomalies. The text should identify which sample locations established to investigate these anomalies.

4.3.5.1 Site 1

The text indicates "a total of eight test pits, seven sample borings...were excavated or drilled". However, it appears seven test pits and eight soil borings were conducted.

The second paragraph does not appear to belong in this subsection.

4.3.5.2 Site 2

Because borings SB-02-11, SB-02-12 and SB-02-13 characterize part of DG3 and all other borings within DG3 are part of "Site 2 (West)", these boring locations should also be included under "Site 2 (West)".

While the text indicates 34 test borings were conducted in Site 2 West, Figure 4-10 indicates 48 boring locations in this area. The additional "borings" were apparently collected from the sidewall of a pipe installation trench in response to the detection of VOCs in soil gas in this area. Figure 4-10 should be revised to reflect this. With regard to these samples, no field logs or other information are provided to document visual observations and/or PID readings and the basis for the location and depth of samples. For example, while elevated PID readings of greater than 100 ppm and a layer of stained soil were encountered in parts of this trench during excavation, the report provides no information in this regard.

While it is noted that "samples were not collected from TR1 because the suspected trench at this location was determined to be an extension of the stormdrain uncovered during testpit

work at TR2", logs for the subject test pits (and the basis for this conclusion) are not included in the report.

The fourth paragraph indicates that if no evidence of potential contamination was found, "samples were taken from the deepest depth of non-native materials (if present) or the base of the boring/test pit". Based on a review of the available logs, this was not necessarily the case. The referenced approach should have been followed only in cases where the original waste had been excavated and replaced with fill material, e.g., impoundments IM1 through IM8.

4.3.5.3 Site 3

While Figure 4-12 indicates that borings were conducted at SB-03-01 through SB-03-06, these are the locations of samples collected during the installation of transfer piping through this area to confirm there was no soil contamination of concern. Since aerial photo interpretations indicate these locations were unlikely to be within Site 3, it appears inappropriate to consider the collection of these samples as part of RI work for Site 3.

Indicate which samples were collected to investigate the source of elevated BTEX in soil gas identified in Figure 4-19.

4.4 CHARACTERISTICS OF AREA A

Note that while Area A is generally flat at this time, aerial photographs indicate a stream flowed through Area A to the immediate east of the former dump D1 and that a ravine formed by the erosion action of this stream was filled when the stream was subsequently replaced by a storm sewer.

4.4.2 Geology and Hydrogeology

Generally, this section should be reviewed to insure consistency with the Interim RI for Area A Groundwater.

4.4.3 Hydrology

No comments are being provided on this section at this time.

4.5 NATURE AND EXTENT OF CONTAMINATION

Since the geophysical and soil gas surveys were conducted prior to the soil borings and test pits, the survey results should be discussed prior to discussing observations from borings and test pits. Survey anomalies which triggered test pits or borings at particular locations should be identified. Appendices with the actual survey results should be referenced.

Indicate appendices which provide the soil boring and test pit logs.

It is important to note that the sample numbers in the analytical data base often do not correspond to sample numbers indicated in boring, test pit or sample logs and that Appendix G includes a "Summary of Analytical Testing" which indicates the actual sample numbers from each soil boring or test pit. Without this information, the reader may be unable to identify the analytical results for a particular boring or test pit log.

In many cases, test pit logs, boring logs, or corresponding sample logs are not provided for locations investigated. This information should be consistently provided for every location.

No sampling depth information is provided for most of the borings and test pits in either the text, tables and figures. This information should be provided in sample location maps or data tables. For example, figures presenting sampling results should indicate the depths from which samples were collected.

In addition to identifying where waste materials were encountered, locations of elevated PID readings should also be identified for each site. Appendix G attempts to summarize this information in the "Comments" column of the "Summary of Analytical Testing". However, while in certain cases these observations are noted, based on a review of the boring logs, in many other cases, these observations are omitted. This table should be consistent and indicate all elevated PID readings.

In some cases, contrary to the workplan, samples were not collected of waste material or a full TCL analysis was not performed on waste material encountered.

Sources should be provided for all federal and state criteria identified in the table in this section. The subject tables do not consider "soil-to-groundwater" criteria. Given the known groundwater contamination in this area, this is an oversight.

As noted in comments on Section 4.6 (Contaminant Transport) below, this section does not (but should) contain a comparison of detected soil contaminant levels to screening criteria for transport for soil to groundwater.

4.5.1 Site 1

It is unclear whether the second paragraph is referring to the results of Phase I or Phase III. If Phase I, this information should be added to the end of the first paragraph. If Phase III, this information should be integrated with the rest of the section.

It is indicated that five of seven test pits showed the presence of a multi-colored silty clay. What is the significance of this

material? Is it a potentially contaminated soil or waste material? If so, please indicate this is the case. Because of the focus placed on observation of this material, information regarding the areal extent and depth of the material (as observed in different test pits and soil borings), the location and depth of samples representative of this material and the corresponding analytical results should be discussed. Note the depth of this material varies. For example, in Test Pit #2, this layer was observed at 3.5' to 5', while in Test Pit #4, it was observed at 6' to 10' in depth.

Note a layer of "black-slimey-gooey-slippery fine material" was found directly below the multicolored layer. Observations regarding the vertical and lateral extent of this layer should be noted.

4.5.1.2 Soil Gas Survey Results

As noted above, this section should precede 4.5.1.1 and indicate which anomalies triggered borings or test pits.

4.5.1.4 Subsurface Soil Results

First paragraph, first sentence, indicate that the nine samples were collected from soil borings.

In the third paragraph, it is indicated that no dioxins/furans were detected. However, Appendix G indicates that no subsurface soil samples at Site 1 were analyzed for these constituents.

Appendix A does not include the analytical results for the test pits.

Figure 4-22 indicates that sample TP-04-01-04, not sample TP-02-01-02, had significant concentrations of benzo(a)pyrene (5.0 mg/kg) and other PAHs.

Figure 4-22 and the text should indicate that two test pits were actually conducted at Test Pit #1, i.e., add Test Pit #1A.

Note that sample T.P.-04-01-04 from Test Pit #4, which was collected from the layer of "black-slimey-gooey-slippery fine material" lying below the multicolored layer, had significant levels of PAHs which may be indicative of the burning activity and that this is one of only two locations in Site 1 where TCE was detected (0.073 ug/kg), the other being Test Pit #2 (0.003 ug/kg), which was also within the estimated area of pit P1.

It is indicated that "elevated levels of antimony and cadmium were found throughout Site 1" and that "metals are scattered uniformly throughout the site". However, levels exceeding screening criteria appear to have been detected only within (or

in the vicinity of) the multicolored layer. For example, levels of these metals were not elevated in samples collected in the eastern part of the Site 1 area. It is further indicated that "these metal concentrations (e.g., antimony, chromium, cadmium) may be associated with the burning of paints, solvents, scrap metals, and unknown chemicals in P1". However, the lack of observed burned material and PAHs in the multicolored materials suggests that this material was not associated with the reported burn pit and may instead be part of the industrial waste treatment sludge reportedly disposed at "Site 2" from 1965 to 1970. These multicolored materials were encountered at the estimated location of trench TR8 which appeared in aerial photo dated 1971 (EPIC, 1994).

4.5.2 Site 2

In the first paragraph, the reference to the waste materials encountered during the Phase I exploratory borings as "the remains of construction or building demolition debris" does not appear accurate. Generally, the logs indicate that larger pieces of construction or building debris, such as that encountered at Site 6, were not encountered in Site 2 or elsewhere in Area A.

The second paragraph notes that out of 71 borings in the vicinity of Site 2, "a total of 26 borings contained non-native materials, and the remaining encountered clean fill or native soil". The definitions of "non-native materials" and "clean fill" should be identified. Clean fill should more accurately be referred to as "apparent clean fill". Given the wide range of depths at which waste materials were encountered at different locations, the statements that "the average thickness of waste material at Site 2 was between 4 and 6 feet from the ground surface' and that the "average thickness of clean fill or native soils ranged from 4 to 6 feet" are oversimplifications and should be deleted.

To help organize this section, it is suggested that the discussion be divided into "Site 2 - East" and "Site 2 - West".

(Site 2 - East)

The third paragraph discusses observations from Test Pits #1, #2 and #3. However, the basis for these observations is not evident as the logs for these test pits are not included with the logs of other test pits in Appendix D.

It is suggested the first sentence in the fourth paragraph read "...along the eastern along the northern and eastern boundary of TR2 and an area of mounded material (MM3) which appeared in an aerial photograph dated 1965".

Again, Appendix G does not consistently indicate all locations where elevated PI readings. For example, in this area, it is not

indicated that a PID reading of 1200 ppm was obtained from a gray layer at 7' in S2-SB-08.

(Site 2 - West)

It is worth noting that EPIC features D1, MM3 and DG3 overlap. To further avoid confusion, it is recommended that references to the number of borings or test pits within a particular feature be consistent with the number that actually appears in the figures. For example, it is indicated 33 borings and one test pit were excavated into the vicinity of D1. However, based on the figures, 15 soil borings and no test pits were advanced into D1. Similarly, an additional 5 soil borings were advanced into the western portion of DG3 which does not overlap with D1, and 6 more borings were advanced west of both of the D1 and DG3.

While the text indicates six borings were within DG3, more accurately, five borings were within an area of DG3 which does not overlap with D1. (We understand that contrary to the figure, no boring was conducted at SB-02-13. This location should be deleted from the figures.) Indicate which of these borings had elevated PID and/or soil gas readings.

While a charred material was apparently encountered at 3' in bores SB-0219, no sample was collected at this depth. In addition, while a PID reading of 12ppm was obtained from waste encountered at 6' in boring S2-SB-18, no SVOC or Pesticide/PCB analysis was conducted in this case.

Again, note which samples were collected in respone to elevated soil gas anomalies, e.g., test pit #8 was excavated to investigate elevated carbon tetrachloride at a depth below 4'.

4.5.2.2 Soil Gas Survey Results

See comments on Sec. 4.5.

Regarding the first bullet, it should also be indicated that BTEX compounds were detected.

It would generally be useful to divide the discussion into chorinated VOC and BTEX detections.

Figure 4-20 indicates two areas where total chlorinated VOC gas concentrations in soil gas exceeded 50 ug/l. First, carbon tetrachloride was detected at 150 ug/l at a depth below 4' about 80' south of the far western edge of DG3. Second, PCE was detected at 34 ug/l and TCE at 29 ug/l at a depth of less than 4' at a location on the far western edge of DG3.

Note benzene was detected below 4' at 170 and 500 ug/l at two consecutive soil gas stations located in the eastern end of DG3 which does not overlap with D1.

Note chlorinated VOCs and BTEX were detected at significantly lower concentrations (less than 20 ug/l) immediately downgradient of fuel storage area.

The location and significance of the referenced 250' by 250' area is unclear.

Benzene was detected at 1500 ug/l at a location which is within the area of Site 3, not Site 2.

The last paragraph in this section does not appear to belong here.

4.5.2.3 Surface Soil Results

Note that Figures 4-23 and 4-24 indicate where hazardous substance concentrations in surface soils exceeded screening criteria in Site 2-East and Site 2-West, respectively. Again, there are references to a surface disposal area (SDA) depicted in Figure 4-7. However, Figure 4-7 shows no such area and there is no apparent basis for designating such an area.

The discussion of VOC results should not be in the introductory paragraph.

The beginning of the second paragraph appears to make a distinction between the SDA and Site 2. Again, it is suggested that references to the SDA and/or a distinction between the SDA and Site 2 should be removed.

Figures 4-23 and 4-24 should be revised to indicate that samples SS-02-01 through SS-02-04 were collected within Site 2 - West, not Site 2 - East. Upon doing so, it becomes evident that only two locations were sampled in Site 2 - East. Given that various PAHs appeared at concentration above screening criteria in one of the two locations in site 2 - East, additional surface soil samples within this area may be warranted to assess risk associated with surface soils.

(Site 2 - West)

Clearly, the most notable surface soil sample result for this area is for SS-SDA-05, where lead was detected at 80800 mg/kg, antimony at 842 mg/kg. Elevated levels of arsenic, cadmium and copper were also detected in this sample. Samples were collected 50' east, west and south of this point, with the most notable

result a level of 1270 mg/kg lead in sample SS-SDA-07, which was 50 feet east of SS-SDA-05. The waste material at this location appears to be similar to that appearing at SS-SDA-05 in that antimony, arsenic, cadmium and copper concentrations are also above background level. Based on the available information, additional sampling is necessary to determine the nature and extent of surface soil contamination with lead and other metals in this area. Note that elevated levels of these metals were also detected in subsurface soil samples just south of this area at 0 to 4' in depth (see comments on Sec. 4.5.2.4).

A review of the surface soil sample locations for this area indicates that only two samples were collected within the area of dump D1. Additional investigation may be necessary to ensure that surface soils within D1 do not present an unacceptable risk.

4.5.2.4 Subsurface Soil Results

In many cases, analysis of soils from the locations of elevated soil gas results or PID readings found no Target Compound List (TCL) VOCs, but did identify tentatively identified compounds (TICs) such aliphatic compounds and other hydrocarbons which are indicative of a release or disposal of petroleum products such as fuel or waste oil. This should be noted to provide an explanation for soil gas anomalies and/or elevated PID readings where TCL VOCs were not detected. At this time, no TIC data is provided in the report. At a minimum, TIC data should be included in the appendices for locations with elevated PID or soil gas levels and all RI TIC data should be part of the administrative record. As discussed, data which indicates the release or disposal or petroleum products should be reported to meet the requirements of Section 120(h) of CERCLA.

(Site 2 - East)

While soil boring S2-SB-08 had a PID reading of 1200 ppm from a layer of gray material at 7', Appendix G indicates that sample SB-02-10 from this boring had no VOCs and was not analyzed for SVOCs. In addition, no TIC data is included which may provide an explanation for this PID reading. Based on this limited information, the nature and extent of contamination at this location is unknown and should be further investigated.

While the boring log for S2-SB-07 does not indicate elevated PID readings anywhere within the boring, a gray-brown clay sampled at this location contained significant levels of benzo(a)pyrene (5.9 mg/kg), over 60 mg/kg of SVOC TICs, and over 19 mg/kg of ketones. It is unclear how no PID readings were recorded with this material. Confirm analytical results for this sample and the sample SB-02-10 are not reversed. In any case, additional sampling may be necessary to characterize the nature and extent

of contamination associated with the sample reportedly collected from S2-SB-07.

(Site 2 - West)

While the fourth paragraph on p.4-62 indicates "metals were found scattered uniformly throughout Site 2", the data and Figures 4-25 and 4-26 indicate that metals exceeded screening criteria in relatively localized areas. In addition, elevated metals do not occur "especially southwest of the OHM trailer area and the eastern part of EPIC feature D1". (Note: Use of the trailer as a reference point is inappropriate since it no longer exists.) According to Figure 4-25, elevated metals occur in the northern portion of both D1 and DG3 , as well as immediately west of these two features.

It is suggested that "inorganics at Site 2 may be attributed to the two former disposal trenches, which allegedly received industrial wastewater sludges from the former impoundment area". Based on the observations in the boring logs and the analytical results, this would not appear to be the case. For example, elevated chromium, which appears to be indicative of industrial wastewater sludges apparently disposed north of the former impoundments, was not detected at elevated levels within this area. Instead, the materials encountered appear to be similar to those reportedly disposed in a former ravine within Area A, i.e., "paint, oil, asphalt, roofing material, solvents, scrap metal and waste from firing ranges".

As noted earlier, the most notable level of metals in surface soil was detected in sample SS-SDE-05, which was collected about 100 feet west of the DG3. Subsurface soils approximately 25' south of this sample location point also contained waste with elevated metals. In particular, ash, slag, cinders and a blue-green soft solid at 0 to 4' in boring SB-02-26 contained 1820 mg/kg lead, 6800 mg/kg copper and 35 mg/kg cadmium. (Note: The detection of elevated cadmium in this sample is not noted in Figure 4-25.) The same material was observed at 0 to 4' in boring SB-02-25 located 35' to the east of SB-02-26. While elevated metals were not detected in SB02-26, the sample was collected at 5.5' to 6' where no wastes were observed.

Elevated levels of metals (lead, antimony, arsenic, cadmium and copper) were also detected in samples collected from borings advanced in the northwestern corners of both D1 and DG3. The samples of interest were collected at 2' to 8' from the following borings - SB-02-31, SB-02-32, SB-02-33, SB-02-47, and SB-02-48.

While minimal TCL VOCs were detected, as mentioned earlier, non-TCL TICs should be discussed as needed to provide an explanation for elevated PID readings or soil gas anomalies. As indicated in Figure 4-19, elevated benzene was detected in soil gas in the

eastern portion of DG3. Note PID readings of up to 150 ppm were encountered in SB-02-11 at depths of up to 5.5' within this area, when the boring was terminated. Figure 4-25 should indicate antimony was detected at 79 mg/kg and cadmium at 36 mg/kg in this boring (at an unknown depth, i.e., no sample log provided) and the text should note that the detection of over 10 ppm of aliphatic hydrocarbons indicates a petroleum product has been released/disposed at this location. Similarly, PID readings of up to 90 ppm were recorded at SB-02-12, which was also terminated at 5.5 feet. Figure 4-25 should indicate arsenic was detected at 19.6 mg/kg in this boring (again, at an unknown depth, i.e., no sample log provided). Due to limited TIC data (no SVOC analysis was performed), the source of the PID readings in this case is unclear, but again, likely attributable to the disposal/release of a petroleum product. As previously noted, boring location SB-02-13 should be removed from Figure 4-25 since this boring was not conducted. Regarding SB-02-09, the boring/sample logs should be provided and Figure 4-25 should indicate which PAHs and PCBs exceeded screening criteria in this boring. Finally, at SB-02-21 in this area, a PID reading of 12 ppm and waste was encountered at 6', but sample analysis was only for VOCs and metals. While no VOCs were detected (the quantitation limit was generally 1.5 mg/kg) and there was limited TIC data (no SVOC analysis was performed), it appears that the source of the PID readings in this case is also petroleum product release/disposal. Lead was detected at 776 mg/kg at this location.

While the source of elevated VOCs detected by PID and soil gas screening in the eastern portion of DG3 are apparently due to the release/disposal of light and/or heavy end petroleum products, it is worth noting that BTEX compounds were not detected and that PCBs and/or lead were each detected above screening levels at only one location in this area. Overall, it appears this area may be the location reportedly used "a disposal site for excess earth generated by grading for extension of an aircraft runway" (see Section 4.4.1) where the subject fill material had been impacted by releases of aircraft fuel or waste oil. It is worth noting that a significant portion of the subject area is currently covered by a paved road.

The results of borings and test pits conducted in response to elevated chlorinated VOCs in soil gas should also be discussed. The subject soil gas levels extended under a trailer which was in place at the time a test pit was excavated at this location. The test pit log indicates at 17' X 5' X 8.5' pit was excavated and that petroleum odors and PID readings ranging up to 45 ppm were encountered from 2' down to 8.5' (the depth of a weathered siltstone). While TCL VOC samples were collected at 3' and 5.5' in depth, no carbon tetrachloride was detected. Based on this limited information, additional investigation may be necessary to confirm that carbon tetrachloride is not present in soil at an unacceptable level. Similarly, soil borings conducted in the area

of elevated TCE and PCE in soil gas at a depth of less than 4' also did not detect the presence of VOC compounds in soil samples. However, in this case, no elevated PID readings were recorded and the minimal VOCs in soil gas below 4' suggested that the source of the these soil gas VOCs is not groundwater. Additional investigation may be warranted in this case as well.

With regard to soil boring SB-02-16 which was installed immediately downgradient of the fuel storage area, note that the elevated PID readings (up to 15 ppm) at 9' to 12' were apparently attributable to aliphatic hydrocarbons, which were detected at a level of over 40 ppm. However, it should also be noted that the highest level of PCE in Area A (36 ug/kg) was detected at this location. Given known, unacceptable levels of PCE in groundwater under this area and the information presented in this report, further investigation of potential PCE contamination of soils in this area may be warranted. Additional information which is not provided in this report should be considered in making this determination, i.e., data generated during the removal of Tank #18.

With regard to samples collected from the sidewall of the trench excavated to install piping, it is difficult to draw any conclusions based on the information presented in this report. As previously indicated, during the excavation of the this trench, an apparent layer of waste was observed at about 3' in depth and PID readings of over 100 ppm were encountered. However, there is no information provided regarding the observation of this layer or the elevated PID readings. Additional investigation appears necessary in this area to confirm there is no unacceptable risk associated with the subject soils.

Table 4-8 does not indicate that the representative concentration of trans-1,3-dichloropropene exceeded the identified screening criteria.

4.5.3 Site 3

4.5.3.2 Soil Gas Survey Results

Figure 4-19 indicates that BTEX compounds were detected in soil gas at a station in the vicinity of well DG-13 at a level exceeding 1000 ug/l and Appendix C indicates that benzene was detected at a level of 1500 ug/l at a depth of less than 4 feet at this location. However, the survey was not expanded in this area (per the workplan) to determine the areal extent of anomaly, e.g., there was no soil gas station to the east of the subject station. (Note: This anomaly was mentioned in Sec. 4.5.2.2 as part of discussion of Site 2. However, given the apparent

proximity to DG1 (within 60 feet), this anomaly appears more appropriate to discuss as part of Site 3.)

Figure 4-19 also indicates that the soil gas survey did not actually cover the apparent area of the burn pit. An explanation should be provided.

4.5.3.4 Subsurface Soil Results

It is indicated that two samples were analyzed for TPH and that 63 and 310 mg/kg were detected. Which samples are these?

Which boring was designed to investigate the elevated level of benzene and BTEX in soil gas?

A PID reading of 60 ppm was obtained from sample T01-03-01, which was collected 2.5' in depth. Note that the quantitation limit for PAHs in this case was 39 to 95 ppm and that estimated levels of PAHs such as fluoranthene (6.1 ppm) suggest that benzo(a)pyrene levels may be significantly above screening criteria in this sample. (In addition, note that TICs in this sample exceed 100 pm and are indicative of the petroleum products.) As a result, while Figure 4-28 reports that only 250 ug/kg of benzo(a)pyrene was detected at this location, it should be clear that this level was detected in sample TP01-03-01A, which was collected at an unspecified depth which likely contained minimal waste.

While boring SB-03-09 encountered a black-gray waste material and a PID reading of 4 ppm at 4', a sample from this boring was collected from clean fill or native soil at 9' and analyzed only VOC and metals. In addition, while the same waste was encountered in boring SB-03-10, no analysis was performed for SVOCs, a likely contaminant.

Since the analytical data for Phase II soil borings SB-03-06 and SB-03-07 is included and evaluated in this report, the logs for these boring should be included in the appendices.

Figure 4-28 indicates the same test pit is both Test Pit #1 and Test Pit #2. The appendices include the log for only one of the three test pits conducted in this area and it is unclear which test pit this corresponds to.

The highest detected levels of both benzo(a)pyrene and lead were detected in boring SB-03-08. Where is this boring located relative to the location of elevated benzene in soil gas? It is worth noting that no samples have been collected north of this location to determine the nature and extent of the contamination detected in this boring.

4.5.4 Impoundment Area

What was the purpose of sample location IM507?

For impoundment 5 (IM5), note that fuel odors were encountered in borings IM504 and IM505 and that a slight fuel odor was encountered in IM501. Why were no PID readings provided in the logs for these borings?

4.5.4.2 Soil Gas Survey

The highest level of benzene detected in soil gas under the impoundments was 130 ug/l (at depth of greater than 4'). Soil gas was not sampled directly south of the subject station or between this station and the "fuel farm area" to help determine the nature and extent of the subject contamination.

4.5.4.3 Subsurface Soil Results

The first sentence in this section should indicate the samples were collected from below or in the vicinity of all eight impoundments, not just IM4, IM5, IM6 and IM7.

The last sentence in the first paragraph on p.4-86 indicates that cadmium levels in one case "were the highest found in soils at the base during Phase III". This statement is incorrect and should be deleted.

Regarding the last paragraph, exceedances of screening criteria for cadmium and antimony were also reported for a sample from IM5.

While apparent waste materials were observed or PID readings recorded in borings through fill placed at the location of the former impoundments, the subject materials were not sampled. In a particular, materials encountered included "slag", "possible black staining" "possible slight chemical odor", and "mixed colors" (in IM1), a fuel odor and elevated PID readings of up to 8 ppm (in IM4), and coal, ash, slag and cinders (IM2).

The results of organic compound analysis, particularly TICs, for soils containing a fuel odor in IM5 should be discussed.

4.6 CONTAMINANT FATE AND TRANSPORT

The discussion in this section is entirely generic in nature, i.e., there is no reference to site-specific RI data. Given the known groundwater contamination under Area A, an evaluation of the site-specific RI data with regard to potential contaminant transport from soil to groundwater is necessary. This evaluation

should be consistent with the EPA Soil Screening Guidance: User's Guide (April 1996) and EPA Soil Screening Guidance: Technical Background Document (May 1996), which are used to determine contaminants in soil which need further investigation at NPL sites. As noted previously, Sec. 4.5. does not initiate the screening process described in these documents.

In addition to an evaluation of the potential transport of CERCLA hazardous substances to groundwater, the potential migration of petroleum products to groundwater should also be considered to support the transfer of property where a release of petroleum products has been documented. The Pennsylvania DEP should be consulted in this regard.

Another contaminant transport pathway which is not considered is the migration of contaminants from soil to groundwater to surface water and/or sediment. For example, contaminants in shallow groundwater may potentially be discharging to a storm drain associated with outfall OF-1. This pathway should be evaluated.

4.7 BASELINE RISK ASSESSMENT

Consider EPA comments dated April 17, 1996, prepared by Nancy Rios Jafolla. Recall some of these comments address previously discussed sections of the report, e.g., calculation of representative concentrations, etc.

In addition, it is assumed that ongoing discussions between the Navy and EPA will further refine the risk assessment process for Area A soils/waste and the need for additional investigation in certain areas.

Note that comments on the potential risks posed by surface water and sediment are not being provided in this transmittal.

4.8 CONCLUSIONS AND RECOMMENDATIONS

This section should be revised as necessary after the above comments are addressed. We request an opportunity to review the revised version of this section prior to publishing the next version of this report.