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LETTER TRANSMITTING COMMENTS REPORT FOR DRAFT REMEDIAL INVESTIGATION
(RI) REPORT FOR FIREFIGHTER TRAINING AREA, LIGHTER AMPHIBIOUS RESUPPLY
CARGO (LARC) 60 MAINTENANCE AREA, AND AUTO CRAFT AREA FORT STORY VA

4/5/1996

MALCOLM PIRNIE

April 5, 1996

Mr. Steve Cho
USAED - Baltimore District
10 South Howard Street
Room 10040
Baltimore, Maryland 21203-1715

Re: Response to Comments
Draft RI Report, Fort Story Sites
Contract DACA31-94-D-0017

Dear Mr. Cho:

Malcolm Pirnie is pleased to provide to the U.S. Army Corps of Engineers (USACE), Baltimore District, this **Response to Comments Report for the Draft Remedial Investigation (RI) Report for the FTA, LARC 60 and Auto Craft sites at Fort Story, Virginia.** After review and comment by your office and Fort Eustis, we have finalized responses (five copies enclosed) that address the Virginia Department of Environmental Quality's comments concerning the Draft RI Report.

We have submitted the responses to VDEQ for their review and comment. Upon receipt of their comments to our responses, we will resolve any remaining issues and thereafter finalize the RI Report for the three Fort Story sites.

It has been a pleasure to provide this document to the USACE. We look forward to further discussions relative to this project.

Very truly yours,

MALCOLM PIRNIE, INC.

Anthony K. Pace
Anthony K. Pace
Senior Project Engineer

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Enclosures

c: Dan Musel, Fort Eustis, w/encl (5 copies)
Durwood Willis, VDEQ, w/encl (3 copies)

AKPL405.WPF

**RESPONSE TO VDEQ COMMENTS
DRAFT RI FOR FTA, LARC 60 AND AUTO CRAFT SITES
FORT STORY, VA**

| COMMENT | RESPONSE |
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| 1 | <p>Page 2-10: Analytical data obtained from the containerized soil and purge water indicated that the material was not classified as a hazardous waste with the drums subsequently managed as a solid waste. The text will be revised to reflect the results of the analytical data. Future projects at these sites will include IDW management pursuant to the requirements of the VDEQ Policy.</p> |
| 2 | <p>Page 2-14: Neither pesticides nor PCBs were detected at concentrations greater than trigger levels established during the PA/SI, and therefore, they were not identified as contaminants of concern and were not included in the RI. In addition, the levels detected during the PA/SI are consistent with levels expected due to normal application in industrial areas for pest and weed control, and not from uncontrolled spills or leaks. The text will be revised to reflect these issues.</p> |
| 3 | <p>Page 2-18: It is not clear which site (FTA or Auto Craft) the reference is made since the text at the top of page 2-18 refers to the Auto Craft site while the text at the bottom of the page refers to the FTA site. It is assumed that since Figures 2-10 and 2-11 show the location of samples collected from the area north of the Auto Craft site that the reference is for the FTA.</p> <p>FTA Site - The northern area of the site was investigated in this RI with four DPT points (#1 through #4), one monitoring well (4MW-1), six surface soil (SS-23 through SS-28), and six soil borings (SB-1 through SB-6) sampled in this area of the site with low levels of various contaminants detected. If the area that VDEQ is referencing is the area north of the site then it is unclear why investigations are required there. No samples were collected from the area north of the road (north of where 4MW-1 and SB-1 were installed during this RI) during previous investigations and no documentation is present that suggests that area was used for industrial operations, storage or past disposal.</p> |
| 4 | <p>Page 3-1: Agreed. A detailed revised ecological risk assessment (ERA) addressing these issues will be conducted. The findings (Section 7.0 of the RI Report) will be submitted to VDEQ for review prior to issuance of the Final RI Report.</p> |
| 5 | <p>Page 3-2: Same as response to Comment #4. We believe that there is sufficient analytical data located within drainage areas and conveyances to assess ecological risk. However, if the ERA indicates that there is a potential risk to downstream receptors (i.e., Chesapeake Bay and/or Atlantic Ocean), then additional investigations may be required. The need for additional sampling (if required) will be stated in Section 9, Recommendations.</p> |
| 6 | <p>Page 3-10: Based on the estimated groundwater flow direction stated in the PA/SI, monitoring well 4MW-1 was installed as the upgradient location with all parameters including inorganics analyzed for. However, based upon our evaluation, the groundwater flow direction was determined to be towards the Chesapeake Bay to the north. This change in direction makes 4MW-1 a downgradient well and 4MW-4 the upgradient well, however, inorganics were not analyzed at 4MW-4. The text will be revised to reflect this.</p> |

| COMMENT | RESPONSE |
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| 7 | <p>Page 3-11: There was a typo in the table on Page 3-10. The total arsenic concentration should have read <0.01 not 40.01. The table will be revised.</p> |
| 8 | <p>Page 3-12: The discussion on ecology will be expanded to include fauna including the identification of endangered species for the Fort Story area. A species inventory was conducted by the USACE in 1993 for the Fort Story/Cape Henry region. This list is included as an appendix to the Draft Fort Story Integrated Natural Resource Management Plan prepared by Horne Engineering and Environmental Services in June 1995.</p> <p>A full fauna survey of Fort Story is not expected to be conducted as part of the ERA. In conjunction with the database established in the Horne report, a biological survey for each site will be conducted. Each site's ecology will be described based on vegetative community. Qualitative vegetative surveys would be performed to note vegetation diversity and abundance (e.g., line intercept or quadrat sampling). Additional faunal surveys (herpetological, avian, and mammalian) would be conducted in the field through limited trapping and incidental occurrence verification. A full list of species that could occur on the base will be included. This list would be compiled from the existing information.</p> <p>By conducting surveys at each site and utilizing the list of species for the region, receptor species can be selected with certainty and species' use of each site can be more accurately determined and fewer assumptions made during the risk modeling process. VDEQ states that site-specific inventories would not account for terrestrial animals that range over larger areas. However, the potential exposure to contaminants for these animals would be reduced due to their larger range and typically these animals are not selected as indicator species. The selection of a species with a smaller range is more conservative and therefore, preferable since the potential risk of exposure is greater</p> |
| 9 | <p>Page 4-1: If the results of the USACE NED laboratory analysis are greater for specific compounds than the original sample, the greater results will be reported in the tables in Section 4.0. The raw data results of the NED QA sampling are provided in Appendix D of the Quality Control Summary/ Analytical Results Report (QCS/ARR) and their impacts on data quality discussed in Section 4.2 of the QCS/ARR. Section 4.0 of the RI Report discusses the nature and extent of contamination, not a review of data quality which is discussed in the QCS/ARR.</p> |
| 10 | <p>Page 4-1: Agreed. If any of the sites proceed to a Feasibility Study, the ARARs will be refined to a more site-specific basis.</p> |
| 11 | <p>Page 4-6: All discussions in Section 4.0 regarding comparison to industrial soil screening criteria are preliminary in nature. The results are compared to the industrial screening criteria only as a means for discussion of the severity or significance of the concentrations detected. The text will be revised to reflect this.</p> <p>The human health risk assessment discusses both the industrial and residential screening criteria and is the primary means for determining impacts. Although screening to residential criteria will be conducted for "future land use" scenario, no residential development at these sites are planned or expected.</p> |

| COMMENT | RESPONSE |
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| 12 | Table 4-5: As discussed in Section 2.2.9 and the soil leachability subsection of Section 6.2.1, the acetone is probably the result of decon with isopropyl alcohol. In addition, only one acetone detect out of 72 soil samples exceeded the EPA Region III SSLs for Transfers to Groundwater, and therefore, it is very unlikely that an impact to groundwater would occur. |
| 13 | Table 4-5: Agreed. The revised ERA will address these chemicals. |
| 14 | <p>Table 4-5: Residential criteria will not be compared to in Section 4.0. However, the forum for comparison of soil concentrations to residential criteria will be the risk assessment and data will be compared against industrial and residential values in this assessment.</p> <p>The tables in the risk assessment section and associated text will be revised to reflect the RBC for industrial (3.8 mg/kg) and residential soils (0.43 mg/kg) for arsenic as a carcinogen.</p> |
| 15 | Table 4-5: Agreed. Same as response to Comment #13. |
| 16 | Table 4-6: Agreed. Same as response to Comment #13. |
| 17 | Page 4-16: Vinyl chloride was not detected by the USACE NED laboratory in the QA sampling. The text will be revised to reflect this. A discussion of potential degradation to vinyl chloride will be made in the fate and transport section of the report. |
| 18 | Page 4-20: As stated on page 4-20 and in the third paragraph on page 3-9, our investigations were limited to the site and adjacent to the site. No evaluation of the suspected groundwater divide discussed in the PA/SI could be made. As shown on Figure 2-3 in the PA/SI and Figure 3-5 in the RI report, the FTA site is located on a relatively flat groundwater area with minimal gradient. There is insufficient data available to determine the exact location of the groundwater divide. However, because groundwater elevations are greater in wells (4MW-3 and 4MW-4) south of the site than wells on the site, the groundwater divide may be south of 4MW-4. The text will be revised to reflect this. |
| 19 | Table 4-9: A comparison to residential criteria is provided in the risk assessment. The site is a fenced, operational area with no potential for exposures for trespassers (none indicated) or the general public, and therefore, residential exposures will not be assessed for the "Current Situation". However, an assessment of risk for residential exposures will be made for the "Future Land Use" scenario even though there is no expected residential development. |
| 20 | Table 4-9: A discussion of the leachability of methylene chloride and TCE in the soils at the LARC 60 site is provided in the risk assessment section (page 6-14). Additional discussions related to methylene chloride and TCE leachability will be added to the Fate and Transport Section. |
| 21 | Table 4-9: Comparison to residential criteria for arsenic is provided in the risk assessment section, but as discussed for Comment #14, the text and tables will be revised to include the carcinogenic RBC for arsenic. |

| COMMENT | RESPONSE |
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| 22 | <p>Page 4-23: 100 mg/kg is a Virginia UST comparison value not a screening level. As discussed in paragraph 2 on page 6-12 of the risk assessment, impacts to the site are evaluated based on the concentrations of the hazardous constituents associated with petroleum hydrocarbons, primarily BTEX and PAHs. No additional text is required.</p> |
| 23 | <p>Table 4-11: As stated in the response to Comment #11, the comparisons made in Section 4.0 are only as a means to describe the significance of the concentrations of chemicals detected. Surface water quality criteria are used in the risk assessment to evaluate the contaminants detected in surface water.</p> <p>A revised ERA will evaluate the data versus the BTAG screening levels and federal and state surface water quality criteria for aquatic organisms.</p> |
| 24 | <p>Table 4-12: A discussion of these compounds' impacts on the site are discussed in the risk assessment. The text in Section 4.0 describes the nature and extent of contaminant, not associated impacts.</p> |
| 25 | <p>Table 4-12: Total and dissolved arsenic impacts are discussed in the risk assessment and fate and transport sections. The text in Section 4.0 describes the nature and extent of contaminant, not associated impacts.</p> |
| 26 | <p>Page 4-34: Vinyl chloride was not detected by the USACE NED laboratory. The text will be revised to reflect this.</p> |
| 27 | <p>Table 4-13: The impacts associated with volatile organics in groundwater at the LARC 60 site are discussed in the risk assessment. Migration potential is discussed in the fate and transport section.</p> |
| 28 | <p>Table 4-13: As previously stated, the screening in Section 4.0 is to provide some general significance to the data, not to screen the data. A discussion of metal concentrations in groundwater to all standards and criteria including the Virginia Groundwater Standards is provided in the risk assessment, however, only dissolved data is used because this indicates the component that could potentially migrate to receptors.</p> <p>As stated in the last paragraph on page 2-19, due to the high suspended solids present due to the DPT sampling procedure, no dissolved samples could be collected. However, data collected from the monitoring wells indicated that no dissolved cadmium, chromium or lead were detected indicating that these metals detected in the total samples from the wells and DPT points are associated with sediment not groundwater. Zinc was detected in only 1 dissolved sample and at concentrations less than all standards and criteria. Arsenic was identified as a chemical of potential concern in the risk assessment due to its high dissolved concentrations. Additional text will be added to the fate and transport section further discussing the relationship between the total and dissolved data.</p> |

| COMMENT | RESPONSE |
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| 29 | Page 4-38: The highest concentrations measured were within the former UST pit where the leaks probably occurred. If the concentrations of the chlorinated organics are not above 1% of the solubility limit at this location, it is unlikely that a DNAPL is present. Numerous groundwater samples have been collected in the shallow and deeper areas of the water table aquifer downgradient of the pit and no DNAPL has been detected. Additional groundwater monitoring in this area is unnecessary. |
| 30 | Page 4-39: Agreed. The text will be revised to include a discussion for potential degradation to vinyl chloride. This information will also be included in the fate and transport section. |
| 31 | Table 4-14: A detailed discussion of the potential leachability and transfer to groundwater for these compounds is provided in the risk assessment section on page 6-20 for Soil Leachability for the Auto Craft site. |
| 32 | Table 4-14: They are compared in the risk assessment on page 6-20. |
| 33 | Table 4-14: The industrial and residential RBC for arsenic as a carcinogen will be added to the risk assessment and further evaluations will be made to discuss its impacts. |
| 34 | Page 6-3: Agreed. A revised ERA will include all of these factors and potential receptors. |
| 35 | Page 6-3: As stated in the response to Comment #2, neither pesticides nor PCBs were detected at concentrations greater than trigger levels established during the PA/SI, and the levels detected during the PA/SI were consistent with levels expected due to normal application in industrial areas for pest and weed control, and not from uncontrolled spills or leaks. |
| 36 | Page 6-3: As stated on page 4-2 in the Final Work Plan dated December 1994, due to their infrequent detection during the PA/SI with concentrations typically lower than the trigger levels, only 20 percent of soil samples were analyzed for total metals to determine whether significant levels were present. If the results of the ERA indicate that metals are at unacceptable levels due to adverse risks to the environment then additional investigation to establish the extent of metal contamination may be necessary. |
| 37 | Agreed. The use of the 95th UCL is preferred over the use of maximum concentrations in order to more accurately assess risk. However, because of the 20% screening conducted for metals, insufficient numbers of samples are available to calculate UCLs and maximum concentrations will be used for the quantitative risk assessment calculations. |
| 38 | Page 6-5: Agreed. A "future land use" scenario to include potential exposure to soils through construction activities will be evaluated in the revised risk assessment. |

| COMMENT | RESPONSE |
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| 39 | Table 6-1: The EPA Region III RBCs for non-carcinogens will be adjusted to a target hazard quotient of 0.1 by dividing the RBCs by a factor of 10 because of the detection of multiple contaminants within each media. |
| 40 | Agreed. The RBCs for arsenic as a carcinogen will be added to all risk assessment tables. |
| 41 | Table 6-2: Although the aluminum data was rejected during data validation, they are evaluated in the risk assessment. This is a conservative approach to evaluating risk. |
| 42 | The "F" designated denotes filtered or dissolved samples. The data summary tables in the QCS/ARR provide the results of MW-211F which is a duplicate sample of MW-112F, thereby, showing 4 samples instead of the 3 shown in Table 4-7 and 6-2 of the RI report. The tables in the RI report show the highest concentration of a given compound detected, whether in the original, duplicate or QA split sample. All analytical data will be reviewed again to ensure that the highest concentration detected for each contaminant is presented in the data tables in Sections 4.0 and 6.0. |
| 43 | Tables and text will be revised to show barium concentration of 0.14 mg/l for 4MW-2F. |
| 44 | Same as response to Comment #39. |
| 45 | Table 6-3: Same as response to Comment #39. The carcinogenic RBC for arsenic will be added to the table. The RBCs for thallium carbonate, thallium chloride and thallium sulfate will be used for the thallium. These RBCs are the lowest for the thallium compounds. |
| 46 | Page 6-7: The exposure assessment will be expanded to discuss site controls, surrounding land use, and base housing. |
| 47 | Page 6-8: Since there are no current potable or non-potable users of the groundwater at Fort Story, no quantitative analysis will be conducted for the "Current Situation". An evaluation of the potable use of the aquifer will be made for the "Future land Use" scenario. |
| 48 | Page 6-8: Residential exposures (including adult and children exposures to groundwater, soil, sediment and surface water) for the "future land use" scenario will be evaluated for the revised human health risk assessment. Base worker scenarios will be quantitatively evaluated if COPC are identified from comparison to screening levels and it is determined that an exposure pathway is available. |
| 49 | Page 6-8: Agreed. A quantitative evaluation will be conducted if screening levels are exceeded and exposure pathways are complete. |

| COMMENT | RESPONSE |
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| 50 | Page 6-10: Agreed. If COPC for surface soils at the FTA site are identified in the revised risk assessment, a quantitative evaluation will be conducted for inhalation exposures. |
| 51 | Page 6-10: A revised ERA will be conducted that addresses these issues. |
| 52 | Page 6-11: Same as response for Comment #38. |
| 53 | Table 6-7: Same as response to Comment #39. Carcinogenic RBC for arsenic will be added to the table and associated text. |
| 54 | Table 6-8: Same as response to Comment #39 for RBCs adjustment and same as response to comment #54 for arsenic RBC. |
| 55 | <p>Tables 6-8 and Table 4-12 will be revised to show a dissolved arsenic result of 0.04 ug/l instead of 0.045 ug/l. Only dissolved inorganic data is provided.</p> <p>Table 6-8 will be revised to show a dissolved barium concentration range of 0.012 to 0.07 ug/l instead of 0.012 to 0.072 ug/l. Table 4-12 will also be revised.</p> <p>Table 6-8 will be revised to show cis 1,2-DCE results at 20 to 150 ug/l. As shown on Table 4-13, the on-site lab detected the 150 ug/l at GW06-002. The other detects were 20 ug/l at GW06-003 and 20 ug/l at MW-711 (which is a duplicate sample of MW-117 which was 19 ug/l). In all cases, the highest concentration is noted whenever duplicates, QA splits or on-site analysis was conducted.</p> <p>The tables will be revised (through the use of superscripts and footnotes) to indicate when the maximum concentration used is from a sample other than the designated sample number on the table such as from a duplicate or QA split sample.</p> <p>Table 6-8 will be revised to show TCE results at 18 to 260 ug/l instead of 18 to 180 ug/l. Also the frequency of detection should be 4/33 instead of 3/33.</p> <p>Table 6-8 will be revised to show tetrachloroethene at 8.5 to 170 ug/l instead of 8.5 to 160 ug/l. In all cases, the highest concentration is noted whenever duplicates, QA splits or on-site analysis was conducted. Sample MW-711 is a duplicate of MW-117 and the highest PCE concentration (8.5 ug/l) was noted.</p> <p>Table 6-8 will be revised to show xylenes at 37 to 2,900 ug/l instead of 37 to 3,100 ug/l.</p> |
| 56 | 4-Methyl-2-pentanone (methyl isobutyl ketone - MIBK) will be added to Table 6-8 and the associated text discussing its potential risk. |
| 57 | Table 6-9: Same as response for Comment #39. |
| 58 | Table 6-10: Summary tables for surface water samples will be added to the QCS/ARR. |

| COMMENT | RESPONSE |
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| 59 | Page 6-14: In addition to PCE only exceeding the SSL in 1 of 49 samples, PCE was only detected in 3 of 49 samples. Although PCE is a COPC in groundwater, soil results indicate that the majority of PCE may have already leached out due to a high infiltration rate associated with the sands present in the subsurface. The exceedance of the one PCE result does not justify continued analysis. |
| 60 | Page 6-14: Methylene chloride was detected in the USACE NED split samples, however, they had a "B" designation indicating that it was also detected in the lab blank samples. The QC data including lab blanks did not demonstrate widespread methylene chloride detects. The risk assessment will be revised to include methylene chloride as COPC for leachability. |
| 61 | Page 6-15: Same as response to Comment #46. |
| 62 | Page 6-15: Same as response to Comment #47. |
| 63 | Page 6-16: Same as response to Comment #48. |
| 64 | Page 6-16: Same as response to Comment #49. |
| 65 | <p>Table 6-15: The fluoranthene result of 5,800 ug/kg and benzo(g,h,i)perylene result of 2,000 ug/kg at SB07-001-01 are correct. The summary table result does not include the results from a dilution sample run. The pyrene result of 11,000 ug/kg reported in Table 4-14 and 6-15 exceeded the calibration range, however, as a conservative approach, the number was used in the risk assessment evaluation. The summary table in URS' Data Validation Report only reports the 9,000 ug/kg result because it was within acceptable reporting quality.</p> <p>Table 6-15 is an evaluation of surface soils. Only 1 metal result was available for surface soils.</p> <p>The greatest concentration whether in original, duplicate, QA split or dilution sample was used in the risk assessment.</p> <p>The nickel result will be added to Table 4-14 and evaluated in the hazard assessment in the revised risk assessment. As previously stated, this hazard assessment addresses potential exposures to surface soils, the arsenic detect of 1.5 mg/kg was in sample SB07-004-24 which is a subsurface sample collected at a depth of 2 to 4 feet below land surface. The evaluation of subsurface soil contaminant concentrations will be addressed in the future land use scenario for construction activities.</p> |
| 66 | Same as response to Comment #39 and Comment #53. |
| 67 | Arsenic will be added to the COPC list in the revised risk assessment. However, as stated on page 6-19, the PAHs present are the result of leaching from the asphalt and should not be included as COPC. Their presence is not related to site conditions. |

| COMMENT | RESPONSE |
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| 68 | Page 6-19: A future scenario to include exposure through construction activities will not be quantitatively evaluated because the PAHs are the result of asphalt leaching. The presence of PAHs would be expected in all shallow soils beneath asphalted areas at other locations (bowling lanes parking lot, admin building parking lots, etc.) at Fort Story as well. Each of these areas would not be considered a "hazardous waste site" requiring a human health risk assessment and potential remediation. |
| 69 | The last paragraph will be revised to state that "although several PAHs exceeded EPA RBC, they are probably related to asphalt leaching rather than to petroleum leaks or spills." |
| 70 | The sampling location (SB07-001) is upgradient of the former Auto Craft building with no historical evidence that any petroleum hydrocarbons were spilled or leaked at this area. |
| 71 | Page 6-21: This paragraph will be revised to include a discussion of the limited data available for metals as related to the potential for barium leaching. At this time, the barium levels and detection frequencies do not indicate a potential leaching problem. |
| 72 | Page 6-21: Same as response to Comment #46. |
| 73 | Page 6-21: Same as response to Comment #47. |
| 74 | Page 6-22: Same as response to Comment #48. |
| 75 | Page 6-22: Same as response to Comment #49. |
| 76 | A discussion on the uncertainty will be added to the revised risk assessment. |
| 77 | Page 6-22: Ecological inventories will be included in the revised ERA. |
| 78 | Page 6-23: The revised ERA address potential exposures at receptors in the Chesapeake Bay and Atlantic Ocean and through the soil to air pathway. |
| 79 | Table 6-18: Agreed. The revised ERA will evaluate exposures to the PAHs. |
| 80 | Section 7: This section will be revised based on the results of the revised risk assessment. |
| 81 | Section 8: This section will be revised based on the results of the revised risk assessment. |