APPENDIX J

Ohio EPA Comments

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John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

July 1, 2014

Mr. Brett Merkel
Army National Guard Directorate
ARNGD-ILE Clean Up
111 South George Mason Drive
Arlington, VA 22203

RE: RAVENNA ARMY AMMUNITION PLANT, PORTAGE/TRUMBULL COUNTIES, REVISED DRAFT 2, REMEDIAL INVESTIGATION REPORT FOR SOIL, SEDIMENT, AND SURFACE WATER AT RVAAP-43 LOAD LINE 10, DATED APRIL 17, 2014 (#267000859102)

Dear Mr. Merkel:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Revised Draft 2, Remedial Investigation (RI) Report for Soil, Sediment and Surface Water at RVAAP-43 load line 10" for the Ravenna Army Ammunition Plant, Portage/Trumbull Counties. This report is dated April 17, 2014 and was received at Ohio EPA, Northeast District Office (NEDO) on April 18, 2014. A review extension of July 2, 2014, was requested by Ohio EPA and granted by the Army. The document was prepared by Leidos Engineering Of Ohio, Inc., under contract no. W912QR-04-D-0028. The LL-10 RI report was previously reviewed by Ohio EPA who had identified significant concerns with the report. The Army withdrew the report and moved forward with a planned, revised, resubmitted report. This is the resubmittal of the LL-10 RI report. The report proposes No Further Action (NFA) for soil, sediment, and surface water at LL-10, to attain unrestricted (residential) land use.

Attached are Ohio EPA's comments. Ohio EPA reviewed this report as a standalone document. Ohio EPA also reviewed the previous Ohio EPA comments from the first submittal. As this report serves as a "template" for all forthcoming PBA-08 RI reports, Ohio EPA divided the comments under "global" and "specific" comments although most overlap one another. The global issues are key concepts and concerns that not only affect the LL-10 RI report but will also affect all forthcoming RI reports.

RVAAPLL-10 RI Report - Dated April 17, 2014

Ohio EPA Comments

GENERAL COMMENTS

1. Each AOC/RI Report is a Standalone Document

Each AOC and the corresponding RI report is a standalone document and information necessary to adequately review and understand each specific AOC and RI report needs to be included in the reports. This includes supporting information to conclusions, such as portions of referenced reports, investigations, studies, background, etc. so that Ohio EPA can ensure the RI report's conclusions, data, or course of action are appropriately supported. The LL-10 RI report references many previous studies, investigations, etc. that is used in the RI report but does not adequately discuss or provide enough information for the reviewer to understand the substance of the references. Please include additional information/discussion/data in each RI report, including LL-10.

2. Soil Background-Historical

The RI report compares surface soils to background soils as calculated and presented in the April 2001 Final Phase II RI Investigation Report for the Winklepeck Burning Grounds. Background was calculated for surface soil (0-1 ft.), subsurface soil (2 depths, 1-3 ft., and 4 to 12 ft.), sediment, surface water, unconsolidated filtered ground water, unconsolidated unfiltered ground water, bedrock filtered ground water and bedrock unfiltered ground water. Soil samples were analyzed for metals and PAHs. Background was calculated for metals only; however, the PAHs are also included in the background tables. A review of the historical background information from the Winklepeck Burning Grounds report indicates soil samples were taken from 3 intervals: 0 to 1 ft.; 1 to 3 ft.; and 3 to 12 ft. The background calculation discusses differences in metal concentrations, but practicality of combining into one background value. Lithology aggregation (permeable or impermeable) groupings were explored but would result in smaller sample numbers and thus would not be used. "Aggregating the background data by both depth and lithology, however would result in two groups, surface impermeable soils and subsurface permeable soils, with only five or six samples. Such a small sample size would result in poor estimates of the population statistics for those groups. Thus, for practical reasons, background statistics were estimated using only the depth rather than the lithologic aggregations." In general, it is important that background soil samples should be the same type of soil horizon material as any comparison (on-site) soil samples. Outliers also removed 4 out of the 15 surface soil (0-1 ft.) samples, leaving 11 samples instead of the statistically defensible 12 samples. Also, for the subsurface

information on Ohio's water quality standards. The text should be revised to present this information.

It is the understanding of Ohio EPA that a site-wide surface water investigation is still planned for RVAAP. This includes the interaction between surface water and ground water (which cannot be addressed under the current ground water contract). As Ohio EPA does not know the scope or any of the logistics of the surface water investigation, it is unclear how a site-wide surface water investigation will interface with each AOC and define the interaction with ground water. Ohio EPA recommends that open communication between the Army and Ohio EPA should be completed as the scope of this project unfolds. The LL-10 RI stated that multiple investigations and resources acknowledged that the greatest potential for historical and current off-site contamination was identified as ground water and surface water.

Ohio EPA noted that surface water and sediment backgrounds were also calculated in the Final Winklepeck Burning Grounds Phase II RI Report. Ohio EPA suggests the background methodology and proposed use be discussed.

4. Use of ISM Results

ISM areas and results should be treated as separate AOCs. Results from ISM events should not be combined with either discrete or other ISM data to calculate EPCs and should be considered independent evaluation/assessments. There may be some instances where adjacent and small ISM areas could be combined to make a larger exposure area. However, care must be taken not to oversize the decision unit. Combining small ISM samples would be based on site-specific information such as the extent of contamination, the type or types of COCs, their concentrations and spatial considerations. This change will not affect the results of the assessment presented in the April 17, 2014, revised draft RI for LL-10, as maximum values were used, although 95% UCLs were calculated (*i.e.,* 95% UCL values exceed maximum values). However, the method and text should be changed to ensure the remaining RIs use all ISM data as independent assessments/evaluations. In addition, aggregates of soil data should be based on the extent of contamination, not the boundaries of the AOCs.

5. CERCLA Exclusionary Releases

Pavement is usually not considered a source of CERCLA exclusionary releases. See: http://www.epa.gov/ceppo/web/content/reporting/faq_excl.htm for specifics and revise the text to be consistent with the cited definition. In addition, pavement

(or maps) must be included for each AOC for evaluation to further document if there are interrelations with site-wide media, such as ground water.

In addition, all historical RR tracks, USTs, ASTs, buildings, potable wells, drainage ditches, settling ponds, and other potential source areas must be included on the maps and discussed as possible sources of contamination to soil, ground water, and surface water.

Please evaluate the LL-10 RI report for completion of the above and plan on including these items for all future AOCs/RI reports.

Previous Investigations: Previous investigations have occurred and are discussed in section 2.0 of the LL-10 RI report. However, it is unclear exactly what historical information has been used in the report. Section 4.0, pg. 4-1, lines 23-25 state, "Sediment and surface water samples collected during the previous investigation were only associated with infrastructure (i.e., sumps and sewers) and not with ditches, so they were not used in the evaluation of this RI report." Lines 27-31 state, "Samples collected in support of the building slab removal (USACE 2009a) presented in Section 2.0 were not considered in the DQO evaluation since these data were not received and validated at that time. These data are not included in Table 4-1. However, these samples and any additional chemicals detected in samples collected historically and during the PBA-08 RI are further evaluated in this report." This is confusing and it is unclear if sources and contamination may have been missed due to exclusion of this data.

Ohio EPA would expect all historical information to be evaluated (maps, RVAAP records, building records/blueprints, etc.) in conjunction with a physical site walk-over to assess areas of potential concern for this RI. All previous investigations must be evaluated for inclusion or exclusion in the RI report and adequate support for elimination of the investigation should be provided in the RI report.

Vertical Point of Compliance

It appears in Section 4.1.2, Subsurface Soil Sampling Rationale and Methods, that vertical contamination was evaluated down to 13 ft. bgs. Although not specified, is this the point of compliance for LL-10? If so, please discuss why this depth was chosen and indicate if any excavation would occur that could exceed this depth. Ohio EPA is aware that there is a potential for new facilities at the site, but is unsure to what depth construction would occur. The Report states basement foundations were removed to 4

4. **Pg. 2-7, Characterization of 14 AOCs Report:** As LL-10 is a standalone document, please include a summary of the results of this investigation and identify, in a table, a list of the 14 AOCs that were included in the 14 AOCs report.

5. **Pg. 2-9, Section 2.2.3.8, Under Slab Surface Soils:** The rationale for sampling locations under this section was not provided. Was it included in the Under Slab Surface Soils report? For sampling locations, were specific contaminants associated with specific building activities? Was a VOC sample taken at building 2 and 20?

   Please clarify if the lined and unlined settling ponds, drainage ditches and other known release areas (RCRA Facility Assessment, Jacobs, 1989) to surface water were sampled during any of the investigations, and if so, what were the results?

6. **Figure 3-1, Topography, Ground Water Flow and Surface Water Flow Map:** The map may not accurately portray the ground water flow and Ohio EPA suggests separating ground water from topography and surface water flow directions for each aquifer. Ground water discussions should be revised to be consistent with the FWGWMP reports and discussion on how the two projects will interact should be included. Could regional flow maps for that area be included?

7. **Pg. 4-2, Section 4.1.1, Surface Soil Sampling Rationale and Methods and Pg. 4-7, Section 4.1.2, Subsurface Soil Sampling Rationale and Methods:** The report states the ISM samples were analyzed for TAL metals, explosives, and PAHs. Only 3 ISM samples (15% of the total number of ISM samples collected) were analyzed for RVAAP full-suite analytes. Although Table 4-2 and Table 4-3 presents the general rationale for the sampling location (i.e., characterize former non-operational area, etc.) there is no rationale in the text to discuss eliminating analytes and why only 3 samples were chosen for full-suite. The tables do not specify which 3 samples were analyzed for a full-suite of analytes nor is there any reference to the location of a rationale. Were the same surface sampling locations and the subsurface locations analyzed for full-suite? Please provide rationale for sampling decisions made and analyte selection and elimination. This information needs to be clarified and included in the RI report.

8. **Pg. 4-3, Lines 23-29, Discussing VOC Sampling Location:** The report indicates sampling location for VOC was randomly chosen; however, the report indicated bldg. PE-2 and bldg. PE-20 were used for solvent storage. In addition, an earlier investigation detected carbon tetrachloride in the ground water, in the monitoring well, in the vicinity of bldg. PE-2. Please discuss the rationale for not targeting VOC sampling locations at bldgs. PE-2 and PE-20.

9. **Pg. 4-4, Section 4.1.2, Subsurface Soil Sampling Rationale and Methods:** Was any screening device used, such as a PID, on the borings for selection of sampling locations?

Background, General Comment: Background is mentioned numerous times throughout the LL-10 RI report; however, there is no discussion on how background issues were derived or what value tables from the Final RI Winklepeck Burning Grounds report were used. As the LL-10 RI report is a standalone document, Ohio EPA suggests a clear, concise summary discussion of how background soil values were derived, including the appropriate table(s). This could be included in the text as a separate section or as a separate appendix. It should also be included in all forthcoming RI reports, as appropriate. Ohio EPA noted that sediment and surface water backgrounds were also calculated. As appropriate to each RI report, please approach each as above.

Surface Water and Sediment: It is confusing from the text of the LL-10 RI report if surface water and sediment are located on the AOC. Previous investigations reference surface water and sediments. For instance, the 14 AOCs "collected 19 surface water samples from (1) sumps and basins (12), from sanitary sewers (6) and basement structures (1). Other reports/investigations and the LL-10 RI report references surface water and sediment, which is contrary to the conclusion that surface water and sediment are not located in the AOC. The text is however confusing, and at some points indicates that surface water and sediment were within the AOC and that some screening values were exceeded. Please clarify the text throughout the document indicating the difference between surface water and sediment, and the soil and temporary runoff that was evaluated during the assessment and other definitions, as appropriate. Please define "dry" and "wet" sediments. Please plan on maintaining the same definitions and interpretations consistently throughout all AOCs and all forthcoming RI reports.

Pg. 6-28-30, Section 6.5.5-6.6, AT123D Modeling Results and Table 6-5: The report states "observed ground water concentrations from AOC monitoring wells are included in Table 6-5; however, it should be noted that these wells may not exist near the sample location with the maximum concentration and should not be considered in direct correlation. The observed ground water concentrations were added for comparison, not for screening criteria. The distances to the downgradient receptors were based on the distance along the ground water flow direction to the closest surface body." A comparison to the unconsolidated well was not included. Did MW-006 have detected contaminants?

The modeling indicated various contaminants will exceed MCLs or RSLs at about 15 years or less, with peak concentrations occurring at approximately 25 years or less. However, the report states these chemicals should have already been detected in the

existing ground water and, with the exception of 2,6-DNT, have not been detected in the existing ground water. The modeling results and predictions that constituents should have already impacted ground water and the lack of detected ground water contaminants, are problematic. Due to possible future ground water use as potable water, it is important that the modeling accurately assess the leachablity of contaminants from soil to ground water. The future location and depths of monitoring wells should be recommended in this document to accurately detect contamination directly related to flow direction and suspect areas within each AOC. The current monitoring well locations and depths should also be evaluated. An accurate assessment of contaminants in ground water is crucial to the FWGWMP. The undefined interaction between the facility-wide approach to ground water (and future ground water modelling), future surface water modeling, and site-wide sewers, as they relate to each AOC, are issues that must be addressed.

Are these models appropriate for continued use at RVAAP? Can the assumptions and limitations be changed to represent more accurate site conditions? Are there other models that would be appropriate and more accurate for the RVAAP? How are the specific locations with elevated contaminant levels within an AOC being evaluated to assess if the monitoring wells have been optimally placed (both vertically and horizontally) to accurately detect contaminants in ground water? How will the site-wide investigations interact with specific AOCs? These are just a few questions that need to be discussed. It is the understanding of Ohio EPA that the objective of the SEASOIL modeling and AT123D modeling would give a definitive and accurate representation of soil leachability issues.

10. **Pg. 4-10, Section 4.2.1 and 4.2.2, Surface Water and Sediment Sampling:** Was any historical information evaluated for the surface water and sediment sampling? Ohio EPA suggests the definitions for dry and wet sediment again be defined in this section.

11. **Pg. 4-13, Section 4.4.4, Laboratory Analysis:** Please discuss if the detection limits, as stated in the FWSAP, were met.

12. **Figures:** Are Figures ES-2 and Figure 4-3 the same?

13. **Figure 5-5 and Figure 5-7, Concentrations of Organic SRCs in Surface Soil ISM Grid Samples (Fig. 5-5) and also Subsurface Soil (Fig 5-7):** Please modify/add to the maps title for clarity, data is mostly SVOCs with some pesticides.

14. **Table 5-6, SRC Screening Summary for Surface Soil:** Ohio EPA could not locate a discussion regarding "Minimum Detect," "Maximum Detect," and "Average Result" and there is no note area with the table for this information.

15. **Figure 5-6, Concentrations of Inorganic SRCs of Inorganic SRCs in Subsurface Soil:** The legend states the shaded numerical values are "inorganic Background" but it is unclear what that means as different values are in the various shaded areas, so there is no consistent value provided.

16. **Figures, general comment:** As previous data was collected, it would be helpful if the Figures caption stated the date of the sampling collection(s) and if historical data included the date(s) and which investigation (such as 14 AOCs, etc.) the data was collected under.

17. **Volatile Organic Scan (VOCs):** Was a full scan done for VOCs? It is unclear from Table 5-8, as the same 3 compounds are presented.

18. **Facility-Wide Sampling and Analysis Plan:** Report states the revised February 2011 FWSAP was not used for the LL-10 RI report. Ohio EPA is assuming the FWSAP dated March 2001 was used. Please indicate if all forthcoming RI reports will use the same one and why the most recent version is not used.

19. **Pg. 6-5, Section 6.1.5, Regarding 2,4-DNT and Other Appropriate Areas:** Please include in the discussion 2,6-DNT and the other isomers 3,4-DNT, 2,3-DNT, 2,5-DNT, and 3,5-DNT. Was 2,6-DNT always sampled with 2,4-DNT? Note: 2,4-DNT and 2,6-DNT were sampled in ground water with detections. Ohio EPA raised concerns regarding the possible presence of the other four isomers as even low detections of 2,4- and 2,6-DNT may result in higher levels of the other isomers. A weight of evidence was presented to Ohio EPA from the Army eliminating the possible presence of 3,4-, 2,3-, 2,5-, and 3,5-DNT isomers, based on historical evidence. A discussion regarding 2,4-DNT and 2,6-DNT and the other four isomers should be included for soil in all RI reports.

ft. bgs, how or will it affect unrestricted use (digging, etc.) and the point of compliance, assuming it is 13 ft. bgs.?

RVAAP COPCs as Referenced in Multiple Documents and Pulling It All Together

Multiple documents exist that list the COPCs for RVAAP, including the "Facility-Wide Sampling & Analysis Plan" (FWSAP) pg. 1-3, 3-3, 3-7 (includes list with acceptable detection limits for the baseline risk assessment), the Consent Order (including RVAAP-43 page, which references specific contaminants for this AOC and possible others), and the CUGs. Please review and compare all site-wide COPCs and provide a comprehensive list with referenced sources in LL-10 RI report and all future RI reports for reference. In eliminating specific site-wide COPCs, please provide a detailed explanation with supporting information in order to eliminate each specific COPC. Then provide a list of specific COPC attributable to that specific AOC detailing the activity involved and which COPC has been added to the list, if applicable. Note: Table 3-2, pg. 3-7 in the FWSAP, specifies the required detection limits for COPCs acceptable for the baseline risk assessment. Please discuss if the laboratory detection limits met the detection limits as specified in the FWSAP and if all activities specified in the FWSAP were followed. Please provide a hard copy of all laboratory narratives, discussing any problems encountered and corrective actions taken by the laboratory to support the quality of the data. Please include all analytical data, which can be presented on CD.

SPECIFIC COMMENTS FOR LL-10

1. **Pg. 1-3, Section 1.3, Wet and Dry Sediments:** the report defines "dry sediments" but does not adequately define "wet sediments." For report clarity, please redefine in appropriate places as necessary.

2. **Pg. 2-3, Historical Buildings:** The report lists specific buildings with associated activities but does not have specific COPCs associated with each activity. Please provide this information for clarity. Ohio EPA noted that Buildings PE-2 and PE-20 were used for solvent storage, but Ohio EPA could not locate a discussion or sampling for solvents in the report. In addition, was GPS used to accurately document the location of all demolished buildings? Were the GPS coordinates used to accurately portray their location on the figures?

3. **Pg. 2-6 and 2-7, Relative Risk Site Evaluation (RRSE):** As LL-10 RI is a standalone document, please include a summary of the detected contaminants in surface soil and ground water of the RRSE 1998 report.

(asphalt) has been evaluated in some cases and generally, PAHs were rarely present or released from road materials. A weight of evidence approach is often utilized to discuss likely sources of anthropogenic sources of PAHs and other ubiquitous compounds. Strengthening the weight of evidence in this and other appropriate situations is recommended.

6. Extent of Contamination

The revised LL-10 RI report identified the nature of contamination, but not the extent. The RI report states inorganic and organic Site Related Contaminants (SRCs) exist at LL10, but at low levels, as the risk evaluation met unrestricted use for soil, sediment, and surface water. Please note that the rate and extent of contamination, both vertical and horizontal, for all future AOCs and RIs must be defined, if warranted. This is not an issue for this RI report, as unrestricted use was met, but future RIs should define the extent of contamination and provide maps illustrating the same. Once the extent is defined, the risk assessment can properly identify the exposure areas to be evaluated. Rarely are the AOC borders going to be delineated as the exposure areas.

7. Modeling, Ground Water Monitoring Wells, Comprehensive Investigations

The modeling used to evaluate soil leaching does not appear to be accurate. The modeling conclusions and the comparison of monitoring well data contradict each other and questions remain on the locations/depths of the wells. In addition, the interrelationship between the site-wide investigations (ground water, sewers, future surface water, etc.) and each AOC/RI report is not fully understood by Ohio EPA. The AOC/RI reports need to fully discuss how the interaction between the media will be assessed and appropriately addressed at the facility. Please see below for a more complete discussion regarding these issues.

8. Comprehensive AOC Approach

Site-Wide Investigations: Ohio EPA realizes that several investigations are site-wide (ground water, sewers, and future surface water); however, it is unclear in the reports how comprehensively the evaluation of LL-10 and all future AOCs will address or interact with the site-wide investigations as it relates to each AOC. Therefore, each RI report should discuss the investigation and results conducted and whether there are further impacts at each AOC that need to be referred to in any of the site-wide investigations. All maps must include locations of sewer lines, ground water monitoring wells, surface water bodies, etc. A ground water flow map

evaluation, less than twelve samples were also collected. Eleven samples were also used for subsurface 1 to 3 ft. and 10 for the "deep" various depths, ranging from 4 to 12 ft. Five of the surface and both subsurface depth samples were taken from the same boring/location. The remaining six surface and subsurface depth samples were from different borings/locations. Two tables are presented calculating the background: Table 4-5 for the 0 to 1 ft. surface soil and Table 4-6 for subsurface soil > 1 ft. There is no summary or discussion at the end of the soil background text in the Winklepeck Burning Grounds Final RI report that discusses what values would be used and how they would be used for comparison.

It is the understanding of Ohio EPA that background issues have been discussed multiple times; however, with many new members added to the team (both Army and Ohio EPA) and the use of the background for screening purposes, it may be worthwhile to review and re-affirm the background values for soils. The background soil levels are used throughout the LL-10 RI report for screening purposes, including the modeling and risk assessment, and will be used in all forthcoming RI reports. As such, it is important that everyone is on the same page with soil background.

In addition, the background soil calculation states "Because boring locations were changed during sampling based on the lithological requirements for well screen intervals, all depth intervals for soils were not sampled for each boring." This suggests to Ohio EPA that the soil and ground water background originated from the same locations. Previous concerns were raised regarding background ground water values/well locations. Would this also affect the soil data?

3. Surface Water and Surface Water Background

Regarding Surface water criteria: Surface water data should be compared to both human health FWCUGs/Drinking RSLs and Ohio Water Quality Standards (ORC 3745-1). Note that all surface water bodies are important ecological receptors and should be evaluated when surface waters are present or potentially contaminated by an AOC. The RI for LL-10 included one surface water sample (FWSsw-102, see Table H-7) down gradient from the site. However, only the Outside Mixing Zone Maximum (OMZM) was used for comparison to results from the off-AOC water body. The Outside Mixing Zone Average (OMZA) values are the regulatory value that should be used for this comparison. The average surface water concentrations should not exceed OMZA values and no single value should exceed the OMZM. In addition, Ohio Water Quality Standards are not screening values, but codified values and ARARs for CERCLA cleanup sites in Ohio. See OAC 3745-1 for additional

Ohio EPA is open to discussing the comments in either a meeting or conference call. Please contact me at (330) 963-1207, if you have any questions or would like to schedule a meeting or conference call..

Sincerely,

Nancy Zikmanis for
Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvr

cc: Kevin Sedlak, ARNG, Camp Ravenna
Gail Harris/Rebecca Haney, Vista Sciences
Greg Moore, USACE Louisville

ec: Justin Burke, Ohio EPA, CO, DERR
Brian Tucker, Ohio EPA, CO, DERR
Nancy Zikmanis, Ohio EPA, NEDO, DERR

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
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July 24, 2014

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Vicki Deppisch, Project Manager
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-43 Load Line 10 (Work Activity No. 267-000-859-102)

Dear Ms. Deppisch:

Enclosed for your review are responses to Ohio EPA's comments dated July 1, 2014 regarding the *Revised Draft 2 Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10*. We anticipate the need to revise these proposed responses after our discussion at the July 29, 2014 for a resolution meeting to discuss comments and these preliminary responses.

Please contact the undersigned at (703) 601-7785 or brett.a.merkel.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Brett Merkel

Brett A. Merkel
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR-NEDO
Nancy Zikmanis, Ohio EPA, DERR-NEDO
Justin Burke, Ohio EPA, CO
Kevin Sedlak, ARNG, Camp Ravenna
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Mark Nichter, USACE Louisville
Kevin Jago, Leidos
Jed Thomas, Leidos
Pat Ryan, Leidos-REIMS
Gail Harris, Vista Sciences Corporation

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-43 Load Line 10 (Work Activity No. 267-000-859-102)

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Army Response: Additional Discussion Requested. Regarding historical investigations and data, the RI Report (RIR) provides the following:
1) A list of previous investigations performed at Load Line 10,
2) A description of each of the previous investigations (Section 2.2.3),
3) Conclusions and/or recommendations of each of the previous investigations, including data tables where appropriate,
4) An evaluation of historical data to be used in the evaluation (Section 5.1.4),
5) A summary of historical and recent data that was determined to be used in this RIR (Table 5-2),
6) A presentation of sample results of data (new and old) utilized in this evaluation (Appendix D),
7) A discussion of sample results (new and old) as needed to support the evaluation.

The content of the RIR includes information in the format that was acceptable and necessary for numerous RIs previously approved by the Ohio EPA. It is the Army's belief that this model RIR contains more details and information than what is generally included in any RIR and reflects agreements from discussions and resolution of Ohio EPA's universal comments on PBA 2008 RI/FS Reports (response approval 4 March 2013). The Army respectfully requests from Ohio EPA what specific additional information/discussion/data is required to ensure this report is adequate and presents enough information for the reviewers.

The Army developed the LL10 RIR following requirements under the Ohio EPA Director's Findings and Orders (2004), USEPA's *"Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA"*, (EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988; and other guidance documents that indicate content and tiering in remedial investigations.

2. Soil Background-Historical

The RI report compares surface soils to background soils as calculated and presented in the April 2001 Final Phase II RI Investigation Report for the Winklepeck Burning Grounds. Background was calculated for surface soil (0-1 ft.), subsurface soil (2 depths, 1-3 ft., and 4 to 12 ft.), sediment, surface water, unconsolidated filtered ground water, unconsolidated unfiltered ground water, bedrock filtered ground water and bedrock unfiltered ground water. Soil samples were analyzed for metals and PAHs. Background was calculated for metals only; however, the PAHs are also included in the background

tables. A review of the historical background information from the Winklepeck Burning Grounds report indicates soil samples were taken from 3 intervals: 0 to 1 ft.; 1 to 3 ft.; and 3 to 12 ft. The background calculation discusses differences in metal concentrations, but practicality of combining into one background value. Lithology aggregation (permeable or impermeable) groupings were explored but would result in smaller sample numbers and thus would not be used. "Aggregating the background data by both depth and lithology, however would result in two groups, surface impermeable soils and subsurface permeable soils, with only five or six samples. Such a small sample size would result in poor estimates of the population statistics for those groups. Thus, for practical reasons, background statistics were estimated using only the depth rather than the lithologic aggregations." In general, it is important that background soil samples should be the same type of soil horizon material as any comparison (on-site) soil samples. Outliers also removed 4 out of the 15 surface soil (0-1 ft.) samples, leaving 11 samples instead of the statistically defensible 12 samples. Also, for the subsurface evaluation, less than twelve samples were also collected. Eleven samples were also used for subsurface 1 to 3 ft. and 10 for the "deep" various depths, ranging from 4 to 12 ft. Five of the surface and both subsurface depth samples were taken from the same boring/location. The remaining six surface and subsurface depth samples were from different borings/locations. Two tables are presented calculating the background: Table 4-5 for the 0 to 1 ft. surface soil and Table 4-6 for subsurface soil > 1 ft. There is no summary or discussion at the end of the soil background text in the Winklepeck Burning Grounds Final RI report that discusses what values would be used and how they would be used for comparison. It is the understanding of Ohio EPA that background issues have been discussed multiple times; however, with many new members added to the team (both Army and Ohio EPA) and the use of the background for screening purposes, it may be worthwhile to review and re-affirm the background values for soils. The background soil levels are used throughout the LL-10 RI report for screening purposes, including the modeling and risk assessment, and will be used in all forthcoming RI reports. As such, it is important that everyone is on the same page with soil background. In addition, the background soil calculation states "Because boring locations were changed during sampling based on the lithological requirements for well screen intervals, all depth intervals for soils were not sampled for each boring." This suggests to Ohio EPA that the soil and ground water background originated from the same locations. Previous concerns were raised regarding background ground water values/well locations. Would this also affect the soil data?

Army Response. Additional Discussion Required. The Army would like to brief the new team members at the Comment/Clarification Meeting on the specific comments regarding the soil background study. The Army intends to address these specific comments and present a summary (re-affirmation) of the soil background study during the Comment/Clarification Meeting on July 29, 2014.

Additionally, the Load Line 10 RI Report utilized the background concentrations that were thoroughly evaluated by both the Army and Ohio EPA. The Army will incorporate a description of the rigorous process implemented to develop these background concentrations into the Briefing. The Load Line 10 RIR uses the background values established for inorganics as described and approved in the Work Plan and numerous previously –approved documents. The Army believes the accepted background values for inorganics are still applicable and appropriate.

3. Surface Water and Surface Water Background

Regarding Surface water criteria: Surface water data should be compared to both human health FWCUGs/Drinking RSLs and Ohio Water Quality Standards (ORC 3745-1). Note that all surface water bodies are important ecological receptors and should be evaluated when surface waters are present or potentially contaminated by an AOC. The RI for LL-10 included one surface water sample (FWSsw-102, see Table H-7) down gradient from the site. However, only the Outside Mixing Zone Maximum (OMZM) was used for comparison to results from the off-AOC water body. The Outside Mixing Zone Average (OMZA) values are the regulatory value that should be used for this comparison. The average surface water concentrations should not exceed OMZA values and no single value should exceed the OMZM. In addition, Ohio Water Quality Standards are not screening values, but codified values and ARARs for CERCLA cleanup sites in Ohio. See OAC 3745-1 for additional information on Ohio's water quality standards. The text should be revised to present this information. It is the understanding of Ohio EPA that a site-wide surface water investigation is still planned for RVAAP. This includes the interaction between surface water and ground water (which cannot be addressed under the current ground water contract). As Ohio EPA does not know the scope or any of the logistics of the surface water investigation, it is unclear how a site-wide surface water investigation will interface with each AOC and define the interaction with ground water. Ohio EPA recommends that open communication between the Army and Ohio EPA should be completed as the scope of this project unfolds. The LL-10 RI stated that multiple investigations and resources acknowledged that the greatest potential for historical and current off-site contamination was identified as ground water and surface water. Ohio EPA noted that surface water and sediment backgrounds were also calculated in the Final Winklepeck Burning Grounds Phase II RI Report. Ohio EPA suggests the background methodology and proposed use be discussed.

Army Response: Discussion Requested. The Army's current approach is to address surface water on an AOC by AOC basis. This also included collecting an off-AOC, downgradient collocated surface water and sediments sample FWS-102. Impacts that Load Line 10-specific sediment and surface water has on groundwater is discussed in Section 6.0. Surface water and exposure pathways are fully addressed and evaluated, where appropriate in the Human Health and Ecological Risk Assessments. ARARs such as OAC 3745-1 will be evaluated in the FS if risks are identified for the surface water or sediment.

4. Use of ISM Results

ISM areas and results should be treated as separate AOCs. Results from ISM events should not be combined with either discrete or other ISM data to calculate EPCs and should be considered independent evaluation/assessments. There may be some instances where adjacent and small ISM areas could be combined to make a larger exposure area. However, care must be taken not to oversize the decision unit. Combining small ISM samples would be based on site-specific information such as the extent of contamination, the type or types of COCs, their concentrations and spatial considerations. This change will not affect the results of the assessment presented in the April 17, 2014, revised draft RI for LL-10, as maximum values were used, although 95% UCLs were calculated *(i.e.,* 95% UCL values exceed maximum values). However, the method and text should be changed to ensure the remaining Rls use all ISM data as independent assessments/evaluations. In addition, aggregates of soil data should be based on the extent of contamination, not the boundaries of the AOCs.

Army Response: Clarification Requested. The Army understands that the ISM areas and results should be related to exposure areas and not the AOC boundaries. Per the recent direction of Ohio

EPA, ISM areas will be treated as separate decision units. Decision units should be such that the nature and extent can be determined and they are not always relevant to the exposure area. The size of the AOC and the boundaries of the AOC are independent factors in the assessment of decision units. The Army also acknowledges Ohio EPA's position that this change will not affect the results of the assessment provided in the April 17, 2014 version of the report.

5. CERCLA Exclusionary Releases

Pavement is usually not considered a source of CERCLA exclusionary releases. See: http://www.epa.gov/ceppo/web/content/reporting/fag excl.htm for specifics and revise the text to be consistent with the cited definition. In addition, pavement (asphalt) has been evaluated in some cases and generally, PAHs were rarely present or released from road materials. A weight of evidence approach is often utilized to discuss likely sources of anthropogenic sources of PAHs and other ubiquitous compounds. Strengthening the weight of evidence in this and other appropriate situations is recommended.

Army Response: Clarification. The text will be revised to ensure terminology is consistent with CERCLA and with other regulatory definitions. The weight of evidence will be modified to note that the potential for PAHs to leach from asphalt is small. The contribution of paved areas to the PAH concentrations is a result of asphalt particles as well as particles from tire wear and diesel exhaust from vehicles driving/idling on the pavement. Very few studies reporting PAH concentration in asphalt particles are available. One study that is available reported total PAHs and benzo(a)pyrene concentrations in particles washed from aged, unsealed, asphalt parking lots (in use and idle) ranging from 7.2 to 410 mg/kg total PAH and 2.2 to 53 mg/kg of benzo(a)pyrene (Mahler 2004). The Mahler study will be added as a reference and other supporting information will be added to the text if available.

New Reference: Mahler, B.J., Van Metre, P.C., and Wilson, J.T., 2004 [revised 2007], Concentrations of polycyclic aromatic hydrocarbons (PAHs) and major and trace elements in simulated rainfall runoff from parking lots, Austin, Texas, 2003 (version 3): U.S. Geological Survey Open-File Report 2004–1208, 87 p.

6. Extent of Contamination

The revised LL-10 RI report identified the nature of contamination, but not the extent. The RI report states inorganic and organic Site Related Contaminants (SRCs) exist at LL 10, but at low levels, as the risk evaluation met unrestricted use for soil, sediment, and surface water. Please note that the rate and extent of contamination, both vertical and horizontal, for all future AOCs and RIs must be defined, if warranted. This is not an issue for this RI report, as unrestricted use was met, but future RIs should define the extent of contamination and provide maps illustrating the same. Once the extent is defined, the risk assessment can properly identify the exposure areas to be evaluated. Rarely are the AOC borders going to be delineated as the exposure areas.

Army Response: Comment noted. Future RIs will be reviewed to ensure the extent of contamination is clearly described and discussed. In addition, the RIs will contain maps, where

appropriate to help depict nature and extent of contamination. Discussion is requested so the Army can better address Ohio EPA's parameters for defining extent in context of the comment.

7. Modeling, Ground Water Monitoring Wells, Comprehensive Investigations

The modeling used to evaluate soil leaching does not appear to be accurate. The modeling conclusions and the comparison of monitoring well data contradict each other and questions remain on the locations/depths of the wells. In addition, the interrelationship between the site-wide investigations (ground water, sewers, future surface water, etc.) and each AOC/RI report is not fully understood by Ohio EPA. The AOC/RI reports need to fully discuss how the interaction between the media will be assessed and appropriately addressed at the facility. Please see below for a more complete discussion regarding these issues.

Army Response: Comment noted. Please refer to the responses below for clarification.

8. Comprehensive AOC Approach

Site-Wide Investigations: Ohio EPA realizes that several investigations are sitewide (ground water, sewers, and future surface water); however, it is unclear in the reports how comprehensively the evaluation of LL-10 and all future AOCs will address or interact with the site-wide investigations as it relates to each AOC. Therefore, each RI report should discuss the investigation and results conducted and whether there are further impacts at each AOC that need to be referred to in any of the site-wide investigations. All maps must include locations of sewer lines, ground water monitoring wells, surface water bodies, etc. A ground water flow map (or maps) must be included for each AOC for evaluation to further document if there are interrelations with site-wide media, such as ground water.

In addition, all historical RR tracks, USTs, ASTs, buildings, potable wells, drainage ditches, settling ponds, and other potential source areas must be included on the maps and discussed as possible sources of contamination to soil, ground water, and surface water.

Please evaluate the LL-10 RI report for completion of the above and plan on including these items for all future AOCs/RI reports.

Previous Investigations: Previous investigations have occurred and are discussed in section 2.0 of the LL-10 RI report. However, it is unclear exactly what historical information has been used in the report. Section 4.0, pg. 4-1, lines 23-25 state, "Sediment and surface water samples collected during the previous investigation were only associated with infrastructure (i.e., sumps and sewers) and not with ditches, so they were not used in the evaluation of this RI report." Lines 27-31 state, "Samples collected in support of the building slab removal (USACE 2009a) presented in Section 2.0 were not considered in the DQO evaluation since these data were not received and validated at that time. These data are not included in Table 4-1. However, these samples and any additional chemicals detected in samples collected historically and during the PBA-08 RI are further evaluated in this report." This is confusing and it is unclear if sources and contamination may have been missed due to exclusion of this data.

Ohio EPA would expect all historical information to be evaluated (maps, RVAAP records, building records/blueprints, etc.) in conjunction with a physical site walk-over to assess areas of potential concern for this RI. All previous investigations must be evaluated for inclusion or exclusion in the RI report and adequate support for elimination of the investigation should be provided in the RI report.

Vertical Point of Compliance: It appears in Section 4.1.2, Subsurface Soil Sampling Rationale and Methods, that vertical contamination was evaluated down to 13 ft. bgs. Although not specified, is this the point of compliance for LL-10? If so, please discuss why this depth was chosen and indicate if any excavation would occur that could exceed this depth. Ohio EPA is aware that there is a potential for new facilities at the site, but is unsure to what depth construction would occur. The Report states basement foundations were removed to 4 ft. bgs, how or will it affect unrestricted use (digging, etc.) and the point of compliance, assuming it is 13 ft. bgs.?

RVAAP COPCs as Referenced in Multiple Documents and Pulling It All Together: Multiple documents exist that list the COPCs for RVAAP, including the "Facility-Wide Sampling & Analysis Plan" (FWSAP) pg. 1-3, 3-3, 3-7 (includes list with acceptable detection limits for the baseline risk assessment), the Consent Order (including RVAAP43 page, which references specific contaminants for this AOC and possible others), and the CUGs. Please review and compare all site-wide COPCs and provide a comprehensive list with referenced sources in LL-10 RI report and all future RI reports for reference. In eliminating specific site-wide COPCs, please provide a detailed explanation with supporting information in order to eliminate each specific COPC. Then provide a list of specific COPC attributable to that specific AOC detailing the activity involved and which COPC has been added to the list, if applicable. Note: Table 3-2, pg. 3-7 in the FWSAP, specifies the required detection limits for COPCs acceptable for the baseline risk assessment. Please discuss if the laboratory detection limits met the detection limits as specified in the FWSAP and if all activities specified in the FWSAP were followed . Please provide a hard copy of all laboratory narratives, discussing any problems encountered and corrective actions taken by the laboratory to support the quality of the data. Please include all analytical data, which can be presented on CD.

Army Response: Clarifications provided below.

1) The RI Report provides a Topography, Groundwater Flow, and Surface Water Flow specific to Load Line 10 (Figure 3-1), Potentiometric Surface of Unconsolidated Aquifer at Camp Ravenna (Figure 3-4), Potentiometric Surface of Bedrock Aquifers (Figure 3-5)

2) For the figures in Section 4 and 5, groundwater monitoring wells, surface water bodies, historical RR tracks, buildings, potable wells, drainage ditches, settling ponds, and other potential source areas are already presented on figures. Sewer line studies, ASTs, USTs are referenced where applicable, but are being addressed under other AOC or CR Site studies.

3) Regarding the comment on Page 4-1, lines 23-25, the sumps and sewers media were not included in the evaluation for this report, as those samples are associated with the FW Sewers AOC and sources pertaining to the FW Sewers AOC.

4) Regarding the comment on Page 4-1, line 27-31, the building slab removal data was not available during the DQO development process. However, at the time of this RI Report, the data was available. Therefore, the data was used in the RI evaluation.

5) As noted in response to comment 2, all historical information was evaluated for inclusion or exclusion in the RI report.

6) Regarding the Vertical Point of Compliance, the Resident Farmer is the representative receptor for Unrestricted (Residential) Land Use. The maximum exposure depth for the Resident

Farmer, as stated in the FWCUG Report, is 13 ft bgs which is why that depth was chosen as a guideline for vertical soil delineation. The RI Work Plan approach did not limit vertical delineation to this depth nor specify a vertical point of compliance. Rather, vertical extent of soil contaminants was evaluated to the most restrictive FWCUGs or background levels regardless of depth. If subsurface contaminants were above these criteria, then vertical sampling was performed to ensure characterization to at least 13 ft bgs.

7) Regarding the identification of site-wide COPCs, the process utilized in the Load Line 10 RI Report aligns with the process specified by the FWCUG Report that was developed by the Army and approved by Ohio EPA. No change is recommended.

8) A hard copy of the Data Quality Control Summary Report and Laboratory Narrative will be provided.

SPECIFIC COMMENTS FOR LL-10

1. Pg. 1-3, Section 1.3, Wet and Dry Sediments: the report defines "dry sediments" but does not adequately define "wet sediments." For report clarity, please redefine in appropriate places as necessary.

Army Response: As noted in response to Load Line 10-specific comment 10, these definitions and explanation will be put in Sections 4.2.1 and 4.2.2. Section 1.3 of the RI Report defines the term "sediment" for purposes of the RI. "Sediment" refers to wet sediment within conveyance ditches, wetlands, or water bodies that are inundated for extended periods of time. In addition, "dry sediment" is evaluated as "surface soil". The definition of "dry sediment" is also provided in Section 1.3.

2. Pg. 2-3, Historical Buildings: The report lists specific buildings with associated activities but does not have specific COPCs associated with each activity. Please provide this information for clarity. Ohio EPA noted that Buildings PE-2 and PE-20 were used for solvent storage, but Ohio EPA could not locate a discussion or sampling for solvents in the report. In addition, was GPS used to accurately document the location of all demolished buildings? Were the GPS coordinates used to accurately portray their location on the figures?

Army Response: Clarification. Additional Discussion Requested. The COPCs were identified in accordance with the process developed by the Army and approved by Ohio EPA in the Facility-wide Cleanup Goal Report. After COPCs were identified, the evaluation included an assessment of COPC distribution across the site wherever the COPCs occur. Discrete soil samples were analyzed for VOCs at locations of former Buildings PE-2 (sample L10ss-038D) and PE-20 (sample L10ss-037D). The building layers shown in the figures are as stored in REIMS. These building layers were developed by digitizing the RVAAP site plan maps and comparing with aerial photos.

3. Pg. 2-6 and 2-7, Relative Risk Site Evaluation (RRSE): As LL-10 RI is a standalone document, please include a summary of the detected contaminants in surface soil and ground water of the RRSE 1998 report.

Army Response: Clarification. The RI Report provides a general summary of the RRSE. The data collected during the 1998 RRSE were not used in the evaluation within this RI due to age and lack of provenance. We recommend that the RI Report does not include the historical RRSE data. Section 2.2.3.5 refers the reviewer to the appropriate location of the data within the RRSE.

4. Pg. 2-7, Characterization of 14 AOCs Report: As LL-10 is a standalone document, please include a summary of the results of this investigation and identify, in a table, a list of the 14 AOCs that were included in the 14 AOCs report.

Army Response: Clarification. As this report is specific to Load Line 10, the Army does not think it is relevant to introduce the other AOCs assessed in the Characterization of 14 AOCs effort. Discussion of additional AOCs may confuse the scope of this specific, standalone report. This information was fully summarized in the approved Work Plan and formed the basis of the sampling for this project.

5. Pg. 2-9, Section 2.2.3.8, Under Slab Surface Soils: The rationale for sampling locations under this section was not provided. Was it included in the Under Slab Surface Soils report? For sampling locations, were specific contaminants associated with specific building activities? Was a voe sample taken at building 2 and 20? Please clarify if the lined and unlined settling ponds, drainage ditches and other known release areas (RCRA Facility Assessment, Jacobs, 1989) to surface water were sampled during any of the investigations, and if so, what were the results?

Army Response: Clarification.
1) The rationale for sampling locations under the "Under Slab Surface Soil" sampling event was presented in the "Final Sampling and Analysis Plan Addendum for the Exposed Soil Sampling and Characterization After Slab and Foundation Removals at Load Lines 5, 7, 8, 10" (USACE 2007). The final report provides a table presenting the building utilization and a sampling matrix conducted as part of the Under Slab Surface Soil sampling event.
2) Discrete soil samples were analyzed for VOCs at locations of former Buildings PE-2 (sample L10ss-038D) and PE-20 (sample L10ss-037D) during the Characterization of 14 AOCs.
3) The 1989 RCRA Facility Assessment did not identify any lined or unlined settling ponds at Load Line 10. These tanks were used as settling basins for explosive-contaminated waste water. Settled sludge was transferred to one of the burning ground sites. These tanks were assessed in the 1996 RVAAP Preliminary Assessment. The sumps and basins were sampled as part of the Characterization of 14 AOCs. The Characterization of 14 AOC risk screen is summarized in Section 2.2.3.7 of the RI Report.

6. Figure 3-1, Topography, Ground Water Flow and Surface Water Flow Map: The map may not accurately portray the ground water flow and Ohio EPA suggests separating ground water from topography and surface water flow directions for each aquifer. Ground water discussions should be revised to be consistent with the FWGWMP reports and discussion on how the two projects will interact should be included. Could regional flow maps for that area be included?

Army Response: Clarification. Figures 3-4 and 3-5 provide regional flow maps for the area (entirety of Camp Ravenna) with Load Line 10 highlighted for reference. These maps were developed based on the groundwater data available at the time of the initial development of this RI Report. Information relating to the facility-wide groundwater AOC is included in the Load Line 10 RI Report as agreed to by stakeholders in resolution of the Ohio EPA's PBA 2008 "universal comments."

7. Pg. 4-2, Section 4.1.1, Surface Soil Sampling Rationale and Methods and Pg. 47, Section 4.1.2, Subsurface Soil Sampling Rationale and Methods: The report states the ISM samples were analyzed for TAL metals, explosives, and PAHs. Only 3 ISM samples (15% of the total number of ISM samples collected) were analyzed for RVAAP full-suite analytes. Although Table 4-2 and Table 4-3 presents the general rationale for the sampling location (i.e. , characterize former non-operational area, etc.) there is no rationale in the text to discuss eliminating analytes and why only 3 samples were chosen for full-suite. The tables do not specify which 3 samples were analyzed for a full-suite of analytes nor is there any reference to the location of a rationale. Were the same surface sampling locations and the subsurface locations analyzed for full-suite? Please provide rationale for sampling decisions made and analyte selection and elimination. This information needs to be clarified and included in the RI report.

Army Response: Clarification:

1) Page 4-1 lines 11-25 summarize the rationale and DQO process that were presented in the approved PBA08 SAP to determine which locations and analytes needed further investigation. Table 4-1 presents the chemicals that were targeted for investigation under the PBA08 field investigation. Metals and PAHs were the only chemicals that exceeded the screening criteria in historical samples. Explosives were added to the sample collection suite based on historical operations knowledge.
2) Based on stakeholder agreement during the DQO process and SAP development, there was a requirement to have 15% ISM sample population be analyzed for full-suite, regardless of the analytes that may be at the AOC due to historical usage.
3) Samples collected for full-suite are denoted in the "Comments/Rationale" column of Tables 4-2 and 4-3. The corresponding location of that sample is presented in the "Station" column.
4) When a full-suite analysis was determined to be collected from a discrete soil boring, the full-suite analysis was performed for each soil sample interval (surface and subsurface) sent to the laboratory.

8. Pg. 4-3, Lines 23-29, Discussing VOC Sampling Location: The report indicates sampling location for VOC was randomly chosen; however, the report indicated bldg. PE-2 and bldg. PE-20 were used for solvent storage. In addition, an earlier investigation detected carbon tetrachloride in the ground water, in the monitoring well, in the vicinity of bldg. PE-2. Please discuss the rationale for not targeting VOC sampling locations at bldgs. PE-2 and PE-20.

Army Response: Clarification. Page 4-3, Lines 23-29 explain why VOCs were not collected and processed as ISM samples, as the samples would be dried, mixed, and sieved, resulting in a loss of VOCs prior to analysis. Discrete soil samples were analyzed for VOCs at locations of former Buildings PE-2 (sample L10ss-038D) and PE-20 (sample L10ss-037D). All VOC concentrations were below screening criteria or non-detects.

9. Pg. 4-4, Section 4.1.2, Subsurface Soil Sampling Rationale and Methods: Was any screening device used, such as a PID, on the borings for selection of sampling locations?

Army Response: Clarification. The approved SAP did not specify use of field screening instruments, e.g., "Field instruments (e.g. PID, FID, XRF) will not be used for the measurement of chemical concentrations or biased sample collection during the implementation." This information is also noted on page 4-13, lines 14-17 of the Load Line 10 RI Report.

10.Pg. 4-10, Section 4.2.1 and 4.2.2, Surface Water and Sediment Sampling: Was any historical information evaluated for the surface water and sediment sampling? Ohio EPA suggests the definitions for dry and wet sediment again be defined in this section.

Army Response: Clarification and agree. All historical information and data associated with Load Line 10 were evaluated in this RI. The following definition, also located on page 1-3 lines 8-19, has been added to the beginning of Section 4.2 on page 4-10:

"For the purposes of this report, the term "surface soil" includes dry sediment. Dry sediment refers to unconsolidated inorganic and organic material within conveyances, ditches, or low lying areas that occasionally may be covered with water, usually following a precipitation event or due to snowmelt. Dry sediment is not covered with water for extended periods and typically is dry within seven days of precipitation. Dry sediment does not function as a permanent habitat for aquatic organisms, although it may serve as a natural medium for the growth of terrestrial organisms. Dry sediment is addressed the same as surface soil [0-1 ft below ground surface (bgs)] in terms of contaminant nature and extent, fate and transport, and risk exposure models. The term "sediment," as used in this report, refers to wet sediment within conveyances, ditches, wetlands, or water bodies that are inundated for extended periods of time. These definitions and terminology usage are consistent with the FWCUG Report (USACE 2010a)."

11. Pg. 4-13, Section 4.4.4, Laboratory Analysis: Please discuss if the detection limits, as stated in the FWSAP, were met.

Army Response: Clarification. As presented in Section 4.4.5 Data Review, Verification, and Quality Assessment (specifically on page 4-15 lines 22-24), all data detection limits were met with one exception for n-nitrosodi-n-proptlamine.

12. Figures: Are Figures ES-2 and Figure 4-3 the same?

Army Response: Yes, Figures ES-2 and 4-3 are the same.

13. Figure 5-5 and Figure 5-7, Concentrations of Organic SRCs in Surface Soil ISM Grid Samples (Fig. 5-5) and also Subsurface Soil (Fig 5-7): Please modify/add to the maps title for clarity, data is mostly SVOCs with some pesticides.

Army Response: Clarification. Figures 5-5 and 5-7 show all detected concentrations of organic SRCs in support of the text discussion for surface soil and subsurface soil organic contaminants (SVOCs, VOCs, Pesticides, PCBs). We do not recommend renaming the figures to indicate a focus on SVOCs and pesticides because there are VOC SRCs presented on these figures.

14. Table 5-6, SRC Screening Summary for Surface Soil: Ohio EPA could not locate a discussion regarding "Minimum Detect," "Maximum Detect," and "Average Result" and there is no note area with the table for this information.

Army Response: Clarification. Section 5.2.2 Contaminant Nature and Extent in Surface Soil discusses general trends regarding the various analyte groups. Where appropriate, maximum and minimum concentrations are discussed to explain the nature and extent of contamination. In addition, Figures 5-2 to 5-5 identify the SRC maximum concentration in red font.

15. Figure 5-6, Concentrations of Inorganic SRCs of Inorganic SRCs in Subsurface Soil: The legend states the shaded numerical values are "inorganic Background" but it is unclear what that means as different values are in the various shaded areas, so there is no consistent value provided.

Army Response: Clarification. The legend states that the shaded numerical value is "Concentrations Below Inorganic Background". The meaning of this is if a concentration is shaded, that concentration is below inorganic background concentration for that chemical.

16. Figures, general comment: As previous data was collected, it would be helpful if the Figures caption stated the date of the sampling collection(s) and if historical data included the date(s) and which investigation (such as 14 AOCs, etc.) the data was collected under.

Army Response: Clarification. On each Section 5 figure, the sample date is included at the top of each data box. Due to the information density on some of the figures, it is recommended to remain as is. Figures ES-2 and 4-3 were developed to distinguish samples collected during the PBA08 RI from those collected during historical investigations.

17. Volatile Organic Scan (VOCs): Was a full scan done for VOCs? It is unclear from Table 5-8, as the same 3 compounds are presented.

Army Response: Clarification. For sediment samples collected during the PBA08 RI, a full suite analysis was performed. The only VOCs presented in Table 5-8 are those that were identified as SRCs.

18. Facility-Wide Sampling and Analysis Plan: Report states the revised February 2011 FWSAP was not used for the LL-10 RI report. Ohio EPA is assuming the FWSAP dated March 2001 was used. Please indicate if all forthcoming RI reports will use the same one and why the most recent version is not used.

Army Response: Clarification. The Facility-wide Sampling and Analysis Plan (FWSAP) dated March 2001 was used during the remedial investigation field activities at Load Line 10 in 2010, as that was the version available at the time. The FWSAP was updated in February 2011 after the Load Line 10 remedial investigation field activities.

19. Pg. 6-5, Section 6.1.5, Regarding 2,4-DNT and Other Appropriate Areas: Please include in the discussion 2,6-DNT and the other isomers 3,4-DNT, 2,3-DNT, 2,5-DNT, and 3,5-DNT. Was 2,6-DNT always sampled with 2,4-DNT? Note: 2,4-DNT and 2,6-DNT were sampled in ground water with detections. Ohio EPA raised concerns regarding the possible presence of the other four isomers as even low detections of 2,4-and 2,6-DNT may result in higher levels of the other isomers. A weight of evidence was presented to Ohio EPA from the Army eliminating the possible presence of 3,4-, 2,3-, 2,5-, and 3,5-DNT isomers, based on historical evidence. A discussion regarding 2,4-DNT and 2,6-DNT and the other four isomers should be included for soil in all RI reports.

Army Response: Clarification. 2,6-DNT and 2,4-DNT were analyzed as part of the explosives chemical suite. At Load Line 10, there were no concentrations of 2,6-DNT or 2,4-DNT above laboratory detection limits in soil, sediment, or surface water.

In addition, per an Army communication to Ohio EPA dated March 25, 2013, the Army provided scientific information explaining that "It is unnecessary to expand beyond the 2,4-DNT and 2,6-DNT isomers, and the proposed expansion has no additional value of being protective to human health and the environment at the former RVAAP." Ohio EPA responded on March 27, 2013 that "We have reviewed the summarized scientific information provided in the correspondence, which is sound, regarding the other 4 DNT isomers, which are not being sampled and analyzed." Accordingly, the explanation in Section 6.1.5 Explosives-Related Chemicals is appropriate and additional text to include the other four isomers is not warranted.

Background, General Comment: Background is mentioned numerous times throughout the LL-10 RI report; however, there is no discussion on how background issues were derived or what value tables from the Final RI Winklepeck Burning Grounds report were used. As the LL-10 RI report is a standalone document, Ohio EPA suggests a clear, concise summary discussion of how background soil values were derived, including the appropriate table(s). This could be included in the text as a separate section or as a separate appendix. It should also be included in all forthcoming RI reports, as appropriate. Ohio EPA noted that sediment and surface water backgrounds were also calculated. As appropriate to each RI report, please approach each as above.

Army Response: Clarification and agree. The Load Line 10 RI Report utilized the approved facility-wide background soil concentrations provided in the Facility-wide Cleanup Goal Report, derived as discussed in the Winklepeck Burning Grounds RI. Because the facility-wide background values are fully discussed in other documents accessible via REIMS and the public website, the Army feels it is adequate to reference the background study rather repeating the

information in the Load Line 10 RI Report. A separate table presenting the background concentrations will be added to this RI report.

Surface Water and Sediment: It is confusing from the text of the LL-10 RI report if surface water and sediment are located on the AOC. Previous investigations reference surface water and sediments. For instance, the 14 AOCs "collected 19 surface water samples from (1) sumps and basins (12), from sanitary sewers (6) and basement structures (1). Other reports/investigations and the LL-10 RI report references surface water and sediment, which is contrary to the conclusion that surface water and sediment are not located in the AOC . The text is however confusing, and at some points indicates that surface water and sediment were within the AOC and that some screening values were exceeded. Please clarify the text throughout the document indicating the difference between surface water and sediment, and the soil and temporary runoff that was evaluated during the assessment and other definitions, as appropriate. Please define "dry" and "wet" sediments. Please plan on maintaining the same definitions and interpretations consistently throughout all AOCs and all forthcoming RI reports.

Army Response: Clarification. Section 3.7 Preliminary Conceptual Site Model explains that "Perennial surface water features with associated sediment are not present within Load Line 10. Surface water at Load Line 10 occurs as intermittent storm water runoff within natural and constructed drainage ditches or conveyances (Figure 3-1)." Surface water and (wet) sediment samples were collected as part of the PBA08 RI from intermittent conveyances and summarized in Section 5.0 Nature and Extent of Contamination. The discussion of sumps and basins, sanitary sewers, and basement structures from the 14 AOCs characterization report explains the location of the historical samples identified as "surface water" at Load Line 10 in that document. These water samples from physical structures were evaluated for appropriate use in the Load Line 10 RI. Basin, sump, and basement water samples were determined to be from structures and not used for evaluation of surface water and sediment conditions within conveyances on Load Line 10. Sewer line water samples are addressed separately in the Facility-Wide Sewers AOC RI/FS Report.

As explained in Section 1.3, the term "sediment" is used in this evaluation. "Sediment" refers to wet sediment within conveyance ditches, wetlands, or water bodies that are inundated for extended periods of time. In addition, "dry sediment" is evaluated as "surface soil". The definition of "dry sediment" is also provided in Section 1.3. As noted in response to Load Line 10-specific comment 10, these definitions and explanation will be put in Sections 4.2.1 and 4.2.2.

Pg. 6-28-30, Section 6.5.5-6.6, AT123D Modeling Results and Table 6-5: The report states "observed ground water concentrations from AOC monitoring wells are included in Table 6-5; however, it should be noted that these wells may not exist near the sample location with the maximum concentration and should not be considered in direct correlation. The observed ground water concentrations were added for comparison, not for screening criteria. The distances to the downgradient receptors were based on the distance along the ground water flow direction to the closest surface body." A comparison to the unconsolidated well was not included. Did MW-006 have detected contaminants?

The modeling indicated various contaminants will exceed MCLs or RSLs at about 15 years or less, with peak concentrations occurring at approximately 25 years or less. However, the report states these

chemicals should have already been detected in the existing ground water and, with the exception of 2,6-DNT, have not been detected in the existing ground water. The modeling results and predictions that constituents should have already impacted ground water and the lack of detected ground water contaminants, are problematic. Due to possible future ground water use as potable water, it is important that the modeling accurately assess the leachablity of contaminants from soil to ground water. The future location and depths of monitoring wells should be recommended in this document to accurately detect contamination directly related to flow direction and suspect areas within each AOC. The current monitoring well locations and depths should also be evaluated. An accurate assessment of contaminants in ground water is crucial to the FWGWMP. The undefined interaction between the facility-wide approach to ground water (and future ground water modelling), future surface water modeling, and site-wide sewers, as they relate to each AOC, are issues that must be addressed.

Are these models appropriate for continued use at RVAAP? Can the assumptions and limitations be changed to represent more accurate site conditions? Are there other models that would be appropriate and more accurate for the RVAAP? How are the specific locations with elevated contaminant levels within an AOC being evaluated to assess if the monitoring wells have been optimally placed (both vertically and horizontally) to accurately detect contaminants in ground water? How will the site-wide investigations interact with specific AOCs? These are just a few questions that need to be discussed. It is the understanding of Ohio EPA that the objective of the SEASOIL modeling and AT1230 modeling would give a definitive and accurate representation of soil leachability issues.

Army Response: Discussion requested. SESOIL and AT123D modeling have been successfully employed in multiple RIs at Camp Ravenna as predictive tools for potential soil to groundwater leaching and migration. The PBA08 RI work planning process included discussion of fate and transport evaluation and use of these modeling tools. The modeling tools are highly conservative and assume no chemical or biological degradation of contaminants. Where conservative modeling indicates various contaminants may potentially exceed MCLs or RSLs, available groundwater data were evaluated to determine if those contaminants were actually present. If modeling indicates that potential leaching should have already occurred, the modeling results are validated by examining actual groundwater concentrations. The Load Line 10 RI Report notes that some chemicals have potential to leach and modeling results were compared to groundwater data. These chemicals, with the exception of 2,6-DNT, were not detected in groundwater indicating the modeling was conservative. Detection of 2,6-DNT occurred 2009 at a concentration of 0.000089 mg/L, which was slightly above the EPA RSL; this chemical was not subsequently detected in 2010 or 2011 groundwater samples. Further groundwater studies at RVAAP AOCs are within the scope of the facility-wide groundwater investigation.

OhioEPA

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

August 11, 2014

Mr. Brett Merkel
Army National Guard Directorate
ARNGD-ILE Clean Up
111 South George Mason Drive
Arlington, VA 22203

RE: RAVENNA ARMY AMMUNITION PLANT, PORTAGE/TRUMBULL COUNTIES, OHIO EPA COMMENTS REGARDING THE CRT FOR "SPECIFIC COMMENTS" ONLY: REVISED DRAFT 2, REMEDIAL INVESTIGATION REPORT FOR SOIL, SEDIMENT, AND SURFACE WATER AT RVAAP-43 LOAD LINE 10, COMMENTS RESPONSE TABLE (CRT), DATED JULY 24, 2014 (#267-000859-102)

Dear Mr. Merkel:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Ohio EPA comments, dated July 1, 2014, for the Revised Draft 2, Remedial Investigation (RI) Report for Soil, Sediment and Surface Water at RVAAP-43 load line 10" for the Ravenna Army Ammunition Plant, Portage/Trumbull Counties. This letter is dated July 24, 2014, and was received at Ohio EPA, Northeast District Office (NEDO) on July 25, 2014. The response to comments (CRT) letter was prepared by Leidos Engineering Of Ohio, Inc. under contract no. W912QR-04-D-0028. Ohio EPA's comment letter, dated July 1, 2014, divided the comments into two sections: "general" (or global) and "specific" sections. As this report serves as a "template" for all forthcoming PBA-08 RI reports, Ohio EPA divided the comments under "general" and "specific" comments, although some overlap one another. The "general" issues are key concepts and concerns that not only affect the LL-10 RI report, but will also affect all forthcoming RI reports. Ohio EPA reviewed this report as a standalone document.

On July 29, 2014, a meeting was held at Ohio EPA's Northeast District Office (NEDO) with Army National Guard, Ohio Army National Guard, U.S. Army Corps of Engineers, Leidos, and Ohio EPA personnel, to discuss site-wide projects and Ohio EPA's comment letter, dated July 2, 2014, regarding the LL-10 RI report. During the July 29th meeting, Leidos presented the responses to "general" comments of Ohio EPA only for LL-10. Ohio EPA was requested to review the "specific" response to comments and respond; this letter addresses the "specific" comments as requested. Please note that many of the "specific" comments overlap the "general" comments and responses may be influenced by discussions that occurred at the July 29th meeting.

Note: It is the understanding of Ohio EPA that upon review of this letter, a "revised" or "second" response letter to Ohio EPA's comment letter of July 1, 2014, will be forthcoming, which addresses the "general" and "specific" comments. The "general" section will reflect the

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conclusions of the meeting as discussed and the "specific" section will respond to Ohio EPA's comments as stated in this letter.

The following are Ohio EPA's responses to "specific" comments. For consistency sake, the numbers remain the same.

1. Adequately addressed.

2. Adequately addressed. Ohio EPA noted that the building locations did not have GPS locations; in the future please utilize this technology to ensure any LUC locations will be well documented.

3. To clarify; Ohio EPA is in agreement to include a brief sentence or two be added to each report to summarize the historical investigation/report information that was used or was excluded in the RI report. Additionally, the tables will reference the location of the source of the data that will be relied upon for the RI (e.g., Appendix A – SI report). The response states, "....the RRSE were not used in the evaluation with this RI due to age and lack of provenance." This is the type of response that is acceptable to Ohio EPA. It was also discussed to include this approach with all forthcoming RI reports.

4. Please refer to comment # 3 above. As discussed in the July 29th meeting, if the data from previous investigations/reports is used for the RI report, it must be identified and included in the report.

5. Please refer to comment # 4.

6. Adequately addressed. If possible, please include flow maps from the last FWGWMP Annual Report prepared by EQM.

7. The Army refers back to the SAP regarding sampling locations, analytes, etc. in the LL-10 RI report. The response provides some additional information and also states "there was a requirement to have 15% ISM sample population be analyzed for full-suite....due to historical usage." Please provide a statement on how the 15% (or 3 samples) were chosen and whether they were biased toward the areas of highest potential contamination.

8. The response states discrete soil samples were analyzed for VOCs at locations of former buildings PE-2 (Sample L10ss-038D) and PE-20 (sample L10ss-037D), and refers back to the text in the report, pg. 4-3 lines 23-29. The text states one discreet VOC sample was taken and was randomly chosen, which contradicts the response. In addition, Ohio EPA could not locate any reference to the two samples (038D and 037D) anywhere in the text or tables. Please revise accordingly.

9. Adequately addressed.

10. Adequately addressed. Please discuss under the surface water and sediment section whether all historical information was evaluated, if any of the historical data was used, and if so where it is located in the report.

    The response also states "These definitions and terminology usage are consistent with the FWCUG Report (USACE 2010a)." Please also reference the Tech Memo of 2013 as it addresses the revisions and use of the FWCUGs.

11. Please clarify. Ohio EPA asked if all the detection limits, as stated in the FWSAP, were met. This is different than the text statement, "All reporting limits and/or method detection limits (MDLs) for undetected analytes remained below FWCUGs....." Ohio EPA recommends adding a table identifying the constituent, the reporting limit, method detection limit, and the limit that was achieved. Please use the FWSAP limits and refer to the FWSAP in the table.

12. If the figures ES-2 and 4-3 are the same, why are they in the report twice with different figure numbers?

13. Regarding "organic" and "inorganic" Figures 5-5 and 5-6: Response indicates the "organic" figure includes SVOCs, VOCs, pesticides, and PBCs. It would be helpful to reviewers to have the analytical parameters defined in the Title, so it is clear what analysis is being presented. Please revise these figure titles accordingly.

14. Adequately addressed.

15. Adequately addressed.

16. Please refer to comment # 12 above, regarding the same figures, the response state either ""Figures ES-2 and 4-3 were developed to distinguish samples collected during the PBA08 RI from those collected during historical investigations." The response to # 12 stated the figures were the same. The figures are both the same. These two responses are inconsistent; please clarify.

17. Adequately addressed. The response states "For sediment samples collected during the PBA08 RI, a full suite analysis was performed." Please add this statement in the text under the sediment discussion.

18. Please clarify what data followed the protocol for the FWSAP updated February 2011, as the response is not clear. Please clearly indicate what reports/investigations/data, etc. are under the March 2001 FWSAP and which are under the updated February 2011 FWSAP in all forthcoming RI reports.

19. Re: 2,6-DNT and 2,4-DNT and isomers: As discussed in the July 29th meeting, it is the understanding of Ohio EPA that a summary paragraph will be provided and the related supportive information will be added to all RI reports, perhaps in a separate appendix.

Re: background: Adequately addressed. Please also include in the metals table a column that presents the background concentrations in all forthcoming RI reports.

Re: surface water and sediment: Adequately addressed. Based upon our meeting and the response, LL-10 RI and all forthcoming RI reports, will include a discussion of the "Sewers," sewer data evaluated for that particular AOC, results (if any), and a conclusion documenting and impacts.

Re: Groundwater modeling: Ohio EPA will defer this discussion to the "general" comments that will be forthcoming. However, under the "specific" comments, this comment was adequately addressed.

In summary, the majority of the comments appear to be organizational in nature to provide enough history, data, and rationale to support the conclusions presented in the LL-10 RI report and subsequent reports.

Please call me at (330) 963-1207, if you have any questions on the above.

Sincerely,

Vicki Deppisch

Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvr

cc: Kevin Sedlak, ARNG, Camp Ravenna
Gail Harris/Rebecca Haney, Vista Sciences
Greg Moore, USACE Louisville

ec: Justin Burke, Ohio EPA, CO, DERR
Brian Tucker, Ohio EPA, CO, DERR
Nancy Zikmanis, Ohio EPA, NEDO, DERR

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
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August 25, 2014

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Vicki Deppisch, Project Manager
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-43 Load Line 10 (Work Activity No. 267-000-859-102)

Dear Ms. Deppisch:

Enclosed for your approval are revised responses to Ohio Environmental Protection Agency (Ohio EPA) comments dated July 1, 2014 regarding the *Revised Draft 2 Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10*. The original responses to comments were provided to Ohio EPA on July 24, 2014. These revised responses are per discussions and agreements made during the July 29, 2014 resolution meeting at the Ohio EPA Northeast District Office and Ohio EPA's follow-on letter dated August 11, 2014.

Based on Ohio EPA's comments and discussions in the July 29, 2014, comment response meeting, the Army understands that the RI adequately demonstrates no unacceptable risk for Unrestricted (Residential) Land Use. Upon your approval of these responses, the Army will submit the Final Load Line 10 Remedial Investigation Report with the document changes presented in these responses and the current conclusion that no further action is necessary for soil, sediment, and surface water.

Please contact the undersigned at (703) 601-7785 or brett.a.merkel.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Brett Merkel

Brett A. Merkel
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR-NEDO
Nancy Zikmanis, Ohio EPA, DERR-NEDO
Justin Burke, Ohio EPA, CO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Greg Moore, USACE Louisville
Mark Nichter, USACE Louisville
Kevin Jago, Leidos
Jed Thomas, Leidos
Gail Harris, Vista Sciences Corporation

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-43 Load Line 10 (Work Activity No. 267-000-859-102)

GENERAL COMMENTS

1. Each AOC/RI Report is a Standalone Document

Each AOC and the corresponding RI report is a standalone document and information necessary to adequately review and understand each specific AOC and RI report needs to be included in the reports. This includes supporting information to conclusions, such as portions of referenced reports, investigations, studies, background, etc. so that Ohio EPA can ensure the RI report's conclusions, data, or course of action are appropriately supported. The LL-10 RI report references many previous studies, investigations, etc. that is used in the RI report but does not adequately discuss or provide enough information for the reviewer to understand the substance of the references. Please include additional information/discussion/data in each RI report, including LL-10.

Army Response: The Army developed the LL10 RIR following requirements under the Ohio EPA Director's Findings and Orders (2004), USEPA's "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA", (EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988; reflects agreements from discussions and resolution of Ohio EPA's universal comments on PBA 2008 RI/FS Reports, and other guidance documents that indicate content and tiering in remedial investigations.

Regarding historical investigations and data, the RI Report (RIR) currently provides the following:

1) A list of previous investigations performed at Load Line 10,
2) A description of each of the previous investigations (Section 2.2.3),
3) Conclusions and/or recommendations of each of the previous investigations, including data tables where appropriate,
4) An evaluation of historical data to be used in the evaluation (Section 5.1.4),
5) A summary of historical and recent data that was determined to be used in this RIR (Table 5-2),
6) A presentation of sample results of data (new and old) utilized in this evaluation (Appendix D),
7) A discussion of sample results (new and old) as needed to support the evaluation.

As discussed during the 7/29/14 resolution meeting, the following changes will be made to the document:

1) The Data Summary and Designated Use for Remedial Investigation table (Table 5-2) will be revised to include footnotes such that it is clear what investigation the sample was collected under.
2) New tables or existing tables in Section 5 will be revised to include all samples used in this RI Report.

2. Soil Background-Historical

The RI report compares surface soils to background soils as calculated and presented in the April 2001 Final Phase II RI Investigation Report for the Winklepeck Burning Grounds. Background was calculated for surface soil (0-1 ft.), subsurface soil (2 depths, 1-3 ft., and 4 to 12 ft.), sediment, surface water,

unconsolidated filtered ground water, unconsolidated unfiltered ground water, bedrock filtered ground water and bedrock unfiltered ground water. Soil samples were analyzed for metals and PAHs. Background was calculated for metals only; however, the PAHs are also included in the background tables. A review of the historical background information from the Winklepeck Burning Grounds report indicates soil samples were taken from 3 intervals: 0 to 1 ft.; 1 to 3 ft.; and 3 to 12 ft. The background calculation discusses differences in metal concentrations, but practicality of combining into one background value. Lithology aggregation (permeable or impermeable) groupings were explored but would result in smaller sample numbers and thus would not be used. "Aggregating the background data by both depth and lithology, however would result in two groups, surface impermeable soils and subsurface permeable soils, with only five or six samples. Such a small sample size would result in poor estimates of the population statistics for those groups. Thus, for practical reasons, background statistics were estimated using only the depth rather than the lithologic aggregations." In general, it is important that background soil samples should be the same type of soil horizon material as any comparison (on-site) soil samples. Outliers also removed 4 out of the 15 surface soil (0-1 ft.) samples, leaving 11 samples instead of the statistically defensible 12 samples. Also, for the subsurface evaluation, less than twelve samples were also collected. Eleven samples were also used for subsurface 1 to 3 ft. and 10 for the "deep" various depths, ranging from 4 to 12 ft. Five of the surface and both subsurface depth samples were taken from the same boring/location. The remaining six surface and subsurface depth samples were from different borings/locations. Two tables are presented calculating the background: Table 4-5 for the 0 to 1 ft. surface soil and Table 4-6 for subsurface soil > 1 ft. There is no summary or discussion at the end of the soil background text in the Winklepeck Burning Grounds Final RI report that discusses what values would be used and how they would be used for comparison. It is the understanding of Ohio EPA that background issues have been discussed multiple times; however, with many new members added to the team (both Army and Ohio EPA) and the use of the background for screening purposes, it may be worthwhile to review and re-affirm the background values for soils. The background soil levels are used throughout the LL-10 RI report for screening purposes, including the modeling and risk assessment, and will be used in all forthcoming RI reports. As such, it is important that everyone is on the same page with soil background. In addition, the background soil calculation states "Because boring locations were changed during sampling based on the lithological requirements for well screen intervals, all depth intervals for soils were not sampled for each boring." This suggests to Ohio EPA that the soil and ground water background originated from the same locations. Previous concerns were raised regarding background ground water values/well locations. Would this also affect the soil data?

Army Response. Per resolution during the 7/29/14 resolution meeting, Ohio EPA agreed that the use of the existing soil, sediment, and surface water background concentrations were acceptable for use at Camp Ravenna. In addition, page 5-3 second bullet (Lines 25-28) and Page 4-5 lines 1-21 will be revised as follows:

- "Background screening: The maximum detected concentration (MDC) of naturally occurring inorganic chemicals were compared to the RVAAP ~~BSVs~~ facility-wide background concentrations, which are published in the Phase II Remedial Investigation Report for Winklepeck Burning Grounds (USACE 2001b) and summarized in the FWCUG Report. If background concentrations were exceeded, the respective inorganic chemicals were retained as SRCs. No BSVs were established for organic chemicals. As such, all detected organic chemicals were retained as SRCs. See Tables 5-6 through 5-9 for a list of the detected naturally occurring inorganic chemicals with background values and the SRC screening results."

3. Surface Water and Surface Water Background

Regarding Surface water criteria: Surface water data should be compared to both human health FWCUGs/Drinking RSLs and Ohio Water Quality Standards (ORC 3745-1). Note that all surface water bodies are important ecological receptors and should be evaluated when surface waters are present or potentially contaminated by an AOC. The RI for LL-10 included one surface water sample (FWSsw-102, see Table H-7) down gradient from the site. However, only the Outside Mixing Zone Maximum (OMZM) was used for comparison to results from the off-AOC water body. The Outside Mixing Zone Average (OMZA) values are the regulatory value that should be used for this comparison. The average surface water concentrations should not exceed OMZA values and no single value should exceed the OMZM. In addition, Ohio Water Quality Standards are not screening values, but codified values and ARARs for CERCLA cleanup sites in Ohio. See OAC 3745-1 for additional information on Ohio's water quality standards. The text should be revised to present this information. It is the understanding of Ohio EPA that a site-wide surface water investigation is still planned for RVAAP. This includes the interaction between surface water and ground water (which cannot be addressed under the current ground water contract). As Ohio EPA does not know the scope or any of the logistics of the surface water investigation, it is unclear how a site-wide surface water investigation will interface with each AOC and define the interaction with ground water. Ohio EPA recommends that open communication between the Army and Ohio EPA should be completed as the scope of this project unfolds. The LL-10 RI stated that multiple investigations and resources acknowledged that the greatest potential for historical and current off-site contamination was identified as ground water and surface water. Ohio EPA noted that surface water and sediment backgrounds were also calculated in the Final Winklepeck Burning Grounds Phase II RI Report. Ohio EPA suggests the background methodology and proposed use be discussed.

Army Response: The Army's current approach is to address surface water on an AOC by AOC basis. This also included collecting an off-AOC, downgradient collocated surface water and sediment sample FWS-102. Impacts that Load Line 10-specific sediment and surface water has on groundwater is discussed in Section 6.0. The ERA (Section 7.3) will be revised to include the OMZA values. See response to comment 2 for proposed changes to clarify source and use of background values.

4. Use of ISM Results

ISM areas and results should be treated as separate AOCs. Results from ISM events should not be combined with either discrete or other ISM data to calculate EPCs and should be considered independent evaluation/assessments. There may be some instances where adjacent and small ISM areas could be combined to make a larger exposure area. However, care must be taken not to oversize the decision unit. Combining small ISM samples would be based on site-specific information such as the extent of contamination, the type or types of COCs, their concentrations and spatial considerations. This change will not affect the results of the assessment presented in the April 17, 2014, revised draft RI for LL-10, as maximum values were used, although 95% UCLs were calculated *(i.e.,* 95% UCL values exceed maximum values). However, the method and text should be changed to ensure the remaining RIs use all ISM data as independent assessments/evaluations. In addition, aggregates of soil data should be based on the extent of contamination, not the boundaries of the AOCs.

Army Response: The Army understands that the ISM areas and results should be related to exposure areas and not the AOC boundaries. Per the recent direction of Ohio EPA received on June 17, 2014 during the technical project planning (TPP) meeting for Load Lines 1-4, 12, ISM areas will be treated as separate decision units. Decision units should be such that the nature and extent can be determined and they are not always relevant to the exposure area. The size of the AOC and the boundaries of the AOC are independent factors in the assessment of decision units. The Army also acknowledges Ohio EPA's position that this change will not affect the results of the assessment provided in the April 17, 2014 version of the report.

5. CERCLA Exclusionary Releases

Pavement is usually not considered a source of CERCLA exclusionary releases. See: http://www.epa.gov/ceppo/web/content/reporting/fag excl.htm for specifics and revise the text to be consistent with the cited definition. In addition, pavement (asphalt) has been evaluated in some cases and generally, PAHs were rarely present or released from road materials. A weight of evidence approach is often utilized to discuss likely sources of anthropogenic sources of PAHs and other ubiquitous compounds. Strengthening the weight of evidence in this and other appropriate situations is recommended.

Army Response: The text will be revised to ensure terminology is consistent with CERCLA and with other regulatory definitions. The weight of evidence will be modified to note that the potential for PAHs to leach from asphalt is small. The contribution of paved areas to the PAH concentrations is a result of asphalt particles as well as particles from tire wear and diesel exhaust from vehicles driving/idling on the pavement.

6. Extent of Contamination

The revised LL-10 RI report identified the nature of contamination, but not the extent. The RI report states inorganic and organic Site Related Contaminants (SRCs) exist at LL 10, but at low levels, as the risk evaluation met unrestricted use for soil, sediment, and surface water. Please note that the rate and extent of contamination, both vertical and horizontal, for all future AOCs and RIs must be defined, if warranted. This is not an issue for this RI report, as unrestricted use was met, but future RIs should define the extent of contamination and provide maps illustrating the same. Once the extent is defined, the risk assessment can properly identify the exposure areas to be evaluated. Rarely are the AOC borders going to be delineated as the exposure areas.

Army Response: The Load Line 10 RI Report adequately depicts extent of contamination in Section 5. Future RIs will be reviewed to ensure the extent of contamination is clearly described and discussed, as done in the Load Line 10 RI Report. Future reports, specifically those identifying contamination requiring remediation, will provide additional figures showing the extent of contamination requiring remediation.

7. Modeling, Ground Water Monitoring Wells, Comprehensive Investigations

The modeling used to evaluate soil leaching does not appear to be accurate. The modeling conclusions and the comparison of monitoring well data contradict each other and questions remain on the locations/depths of the wells. In addition, the interrelationship between the site-wide investigations (ground water, sewers, future surface water, etc.) and each AOC/RI report is not fully understood by Ohio EPA. The AOC/RI reports need to fully discuss how the interaction between the media will be assessed and appropriately addressed at the facility. Please see below for a more complete discussion regarding these issues.

Army Response: Comment noted. Please refer to the responses below for clarification.

8. Comprehensive AOC Approach

Site-Wide Investigations: Ohio EPA realizes that several investigations are sitewide (ground water, sewers, and future surface water); however, it is unclear in the reports how comprehensively the evaluation of LL-10 and all future AOCs will address or interact with the site-wide investigations as it relates to each AOC. Therefore, each RI report should discuss the investigation and results conducted and whether there are further impacts at each AOC that need to be referred to in any of the site-wide investigations. All maps must include locations of sewer lines, ground water monitoring wells, surface water bodies, etc. A ground water flow map (or maps) must be included for each AOC for evaluation to further document if there are interrelations with site-wide media, such as ground water.

In addition, all historical RR tracks, USTs, ASTs, buildings, potable wells, drainage ditches, settling ponds, and other potential source areas must be included on the maps and discussed as possible sources of contamination to soil, ground water, and surface water.

Please evaluate the LL-10 RI report for completion of the above and plan on including these items for all future AOCs/RI reports.

Previous Investigations: Previous investigations have occurred and are discussed in section 2.0 of the LL-10 RI report. However, it is unclear exactly what historical information has been used in the report. Section 4.0, pg. 4-1, lines 23-25 state, "Sediment and surface water samples collected during the previous investigation were only associated with infrastructure (i.e., sumps and sewers) and not with ditches, so they were not used in the evaluation of this RI report." Lines 27-31 state, "Samples collected in support of the building slab removal (USACE 2009a) presented in Section 2.0 were not considered in the DQO evaluation since these data were not received and validated at that time. These data are not included in Table 4-1. However, these samples and any additional chemicals detected in samples collected historically and during the PBA-08 RI are further evaluated in this report." This is confusing and it is unclear if sources and contamination may have been missed due to exclusion of this data.

Ohio EPA would expect all historical information to be evaluated (maps, RVAAP records, building records/blueprints, etc.) in conjunction with a physical site walk-over to assess areas of potential concern for this RI. All previous investigations must be evaluated for inclusion or exclusion in the RI report and adequate support for elimination of the investigation should be provided in the RI report.

Vertical Point of Compliance: It appears in Section 4.1.2, Subsurface Soil Sampling Rationale and Methods, that vertical contamination was evaluated down to 13 ft. bgs. Although not specified, is this the point of compliance for LL-10? If so, please discuss why this depth was chosen and indicate if any excavation would occur that could exceed this depth. Ohio EPA is aware that there is a potential for new facilities at the site, but is unsure to what depth construction would occur. The Report states basement foundations were removed to 4 ft. bgs, how or will it affect unrestricted use (digging, etc.) and the point of compliance, assuming it is 13 ft. bgs.?

RVAAP COPCs as Referenced in Multiple Documents and Pulling It All Together: Multiple documents exist that list the COPCs for RVAAP, including the "Facility-Wide Sampling & Analysis Plan" (FWSAP) pg. 1-3, 3-3, 3-7 (includes list with acceptable detection limits for the baseline risk assessment), the Consent Order (including RVAAP43 page, which references specific contaminants for this AOC and possible others), and the CUGs. Please review and compare all site-wide COPCs and provide a comprehensive list with referenced sources in LL-10 RI report and all future RI reports for reference. In eliminating specific site-wide COPCs, please provide a detailed explanation with supporting information in order to eliminate each specific COPC. Then provide a list of specific COPC attributable to that specific AOC detailing the activity involved and which COPC has been added to the list, if applicable. Note: Table 3-2, pg. 3-7 in the FWSAP, specifies the required detection limits for COPCs acceptable for the baseline risk assessment. Please discuss if the laboratory detection limits met the detection limits as specified in the FWSAP and if all activities specified in the FWSAP were followed . Please provide a hard copy of all laboratory narratives, discussing any problems encountered and corrective actions taken by the laboratory to support the quality of the data. Please include all analytical data, which can be presented on CD.

Army Response: Clarifications and revisions provided below.

1) The RI Report provides a Topography, Groundwater Flow, and Surface Water Flow specific to Load Line 10 (Figure 3-1), Potentiometric Surface of Unconsolidated Aquifer at Camp Ravenna (Figure 3-4), Potentiometric Surface of Bedrock Aquifers (Figure 3-5)

2) For the figures in Section 4 and 5, groundwater monitoring wells, surface water bodies, historical RR tracks, buildings, potable wells, drainage ditches, settling ponds, and other potential source areas are already presented on figures. Sewer line studies, ASTs, USTs are referenced where applicable, but are being addressed under other AOC or CR Site studies.

3) Regarding the comment on Page 4-1, lines 23-25, the sumps and sewers media were not included in the evaluation for this report, as those samples are associated with the FW Sewers AOC and sources pertaining to the FW Sewers AOC.

4) Regarding the comment on Page 4-1, line 27-31, the building slab removal data were not available during the DQO development process. However, at the time of this RI Report, the data were available. Therefore, the data were used in the RI evaluation.

5) As noted in response to comment 2, all historical information was evaluated for inclusion or exclusion in the RI report.

6) Regarding the Vertical Point of Compliance, the Resident Farmer is the representative receptor for Unrestricted (Residential) Land Use. The maximum exposure depth for the Resident Farmer, as stated in the FWCUG Report, is 13 ft bgs which is why that depth was chosen as a guideline for vertical soil delineation. The RI Work Plan approach did not limit vertical delineation to this depth nor specify a vertical point of compliance. Rather, vertical extent of soil contaminants was evaluated to the most restrictive FWCUGs or background levels regardless of

depth. If subsurface contaminants were above these criteria, then vertical sampling was performed to ensure characterization to at least 13 ft bgs.

7) Regarding the identification of site-wide COPCs, the process utilized in the Load Line 10 RI Report aligns with the process specified by the FWCUG Report that was developed by the Army and approved by Ohio EPA. To reduce confusion, Figure ES-1 outlining this process will be removed from the Executive Summary.

8) A hard copy of the Data Quality Control Summary Report and Laboratory Narrative will be provided.

9) Page 1-3 lines 28-35 will be revised as follows:

"Storm and sanitary sewers are present at Load Line 10. As part of the RVAAP-67 Facility-wide Sewers RI, sampling and evaluation of the sewer sediment, sewer water, outfall sediment, outfall water, and pipe bedding material media was performed and identified inorganic chemicals and polycyclic aromatic hydrocarbons (PAHs) as the predominant sewer SRCs. Fate and transport modeling was performed, and an HHRA and ERA were conducted for sewers at the Load Line 10. These evaluations of the current data indicate ~~conclude~~ that NFA is ~~necessary~~ needed with respect to the Facility-wide Sewers within Load Line 10. The full evaluation and conclusion are presented in the *Draft Remedial Investigation/Feasibility Study Report for RVAAP-67 Facility-Wide Sewers* (USACE 2012a)."

SPECIFIC COMMENTS FOR LL-10

1. Pg. 1-3, Section 1.3, Wet and Dry Sediments: the report defines "dry sediments" but does not adequately define "wet sediments." For report clarity, please redefine in appropriate places as necessary.

Army Response: As noted in response to Load Line 10-specific comment 10, these definitions and explanation will be put in Sections 4.2.1 and 4.2.2. Section 1.3 of the RI Report defines the term "sediment" for purposes of the RI. "Sediment" refers to wet sediment within conveyance ditches, wetlands, or water bodies that are inundated for extended periods of time. In addition, "dry sediment" is evaluated as "surface soil". The definition of "dry sediment" is also provided in Section 1.3.

2. Pg. 2-3, Historical Buildings: The report lists specific buildings with associated activities but does not have specific COPCs associated with each activity. Please provide this information for clarity. Ohio EPA noted that Buildings PE-2 and PE-20 were used for solvent storage, but Ohio EPA could not locate a discussion or sampling for solvents in the report. In addition, was GPS used to accurately document the location of all demolished buildings? Were the GPS coordinates used to accurately portray their location on the figures?

Army Response: Clarification. The COPCs were identified in accordance with the process developed by the Army and approved by Ohio EPA in the Facility-wide Cleanup Goal Report. After COPCs were identified, the evaluation included an assessment of COPC distribution across the site wherever the COPCs occur. Discrete soil samples were analyzed for VOCs at locations of former Buildings PE-2 (sample L10ss-038D) and PE-20 (sample L10ss-037D, primary and field duplicate) as part of the Characterization of 14 RVAAP AOCs project; no VOCs were detected in these samples. The building layers shown in the figures are as stored in REIMS.

These building layers were developed by digitizing the RVAAP site plan maps and comparing with aerial photos.

Regarding the Ohio EPA letter on 8/11/14, the Army acknowledges Ohio EPA's request to use GPS technology for documentation where land use controls may be required. Please note that the historical presence of a building does not necessarily indicate that a land use control is required; therefore, the locations of former buildings may not be surveyed using GPS.

3. Pg. 2-6 and 2-7, Relative Risk Site Evaluation (RRSE): As LL-10 RI is a standalone document, please include a summary of the detected contaminants in surface soil and ground water of the RRSE 1998 report.

Army Response: Clarification. The RI Report provides a general summary of the RRSE. The data collected during the 1998 RRSE were not used in the evaluation within this RI due to age and lack of provenance. We recommend that the RI Report does not include the historical RRSE data. Section 2.2.3.5 refers the reviewer to the appropriate location of the data within the RRSE.

4. Pg. 2-7, Characterization of 14 AOCs Report: As LL-10 is a standalone document, please include a summary of the results of this investigation and identify, in a table, a list of the 14 AOCs that were included in the 14 AOCs report.

Army Response: Clarification. As this report is specific to Load Line 10, the Army does not think it is relevant to introduce the other AOCs assessed in the Characterization of 14 AOCs effort. Discussion of additional AOCs may confuse the scope of this specific, standalone report. This information was fully summarized in the approved Work Plan and formed the basis of the sampling for this project. As agreed during the 7/29/14 resolution meeting, changes to the tables in Section 5 will be revised as discussed General Comment 1.

5. Pg. 2-9, Section 2.2.3.8, Under Slab Surface Soils: The rationale for sampling locations under this section was not provided. Was it included in the Under Slab Surface Soils report? For sampling locations, were specific contaminants associated with specific building activities? Was a VOC sample taken at building 2 and 20? Please clarify if the lined and unlined settling ponds, drainage ditches and other known release areas (RCRA Facility Assessment, Jacobs, 1989) to surface water were sampled during any of the investigations, and if so, what were the results?

Army Response: Clarification.
1) The rationale for sampling locations under the "Under Slab Surface Soil" sampling event was presented in the "Final Sampling and Analysis Plan Addendum for the Exposed Soil Sampling and Characterization After Slab and Foundation Removals at Load Lines 5, 7, 8, 10" (USACE 2007). The final report provides a table presenting the building utilization and a sampling matrix conducted as part of the Under Slab Surface Soil sampling event. As agreed during the 7/29/14 resolution meeting, changes to the tables in Section 5 will be revised as discussed General Comment 1.

2) Discrete soil samples were analyzed for VOCs at locations of former Buildings PE-2 (sample L10ss-038D) and PE-20 (sample L10ss-037D) during the Characterization of 14 AOCs. No VOCs were detected in these samples (see also response to Load Line 10 specific comment 2).
3) The 1989 RCRA Facility Assessment and subsequent investigations did not identify any lined or unlined settling ponds specifically at Load Line 10. Nine former concrete settling tanks (e.g., settling basins) were present in Load Line 10. These tanks were used as settling basins for explosive-contaminated waste water. Settled sludge was transferred to one of the burning ground sites on RVAAP. These tanks were assessed in the 1996 RVAAP Preliminary Assessment. The settling tanks were sampled as part of the Characterization of 14 AOCs. The Characterization of 14 AOC risk screen is summarized in Section 2.2.3.7 of the RI Report. The settling tanks were removed during load line demolition activities in 2006 and 2007. Drainage ditches leading off of Load Line 10 were sampled either as part of the Characterization of 14 AOCs and/or the PBA 2008 RI (Figure 4-3; RI Report Sections 5.2.5 and 5.2.6). All detections of site-related contaminants in wet sediment and surface water were estimated values less than laboratory reporting limits or less than EPA RSLs.

6. Figure 3-1, Topography, Ground Water Flow and Surface Water Flow Map: The map may not accurately portray the ground water flow and Ohio EPA suggests separating ground water from topography and surface water flow directions for each aquifer. Ground water discussions should be revised to be consistent with the FWGWMP reports and discussion on how the two projects will interact should be included. Could regional flow maps for that area be included?

Army Response: Clarification. Figures 3-4 and 3-5 provide regional flow maps for the area (entirety of Camp Ravenna) with Load Line 10 highlighted for reference. These maps were developed based on the groundwater data available at the time of the initial development of this RI Report. Information relating to the facility-wide groundwater AOC is included in the Load Line 10 RI Report as agreed to by stakeholders in resolution of the Ohio EPA's PBA 2008 "universal comments."

7. Pg. 4-2, Section 4.1.1, Surface Soil Sampling Rationale and Methods and Pg. 47, Section 4.1.2, Subsurface Soil Sampling Rationale and Methods: The report states the ISM samples were analyzed for TAL metals, explosives, and PAHs. Only 3 ISM samples (15% of the total number of ISM samples collected) were analyzed for RVAAP full-suite analytes. Although Table 4-2 and Table 4-3 presents the general rationale for the sampling location (i.e. , characterize former non-operational area, etc.) there is no rationale in the text to discuss eliminating analytes and why only 3 samples were chosen for full-suite. The tables do not specify which 3 samples were analyzed for a full-suite of analytes nor is there any reference to the location of a rationale. Were the same surface sampling locations and the subsurface locations analyzed for full-suite? Please provide rationale for sampling decisions made and analyte selection and elimination. This information needs to be clarified and included in the RI report.

Army Response: Clarification:
1) Page 4-1 lines 11-25 summarize the rationale and DQO process that were presented in the approved PBA08 SAP to determine which locations and analytes needed further investigation. To expand, the text on Page 4-1, line 22 has been revised as follows:

Previous results were also compared to FWCUGs at the higher target risk (TR) of 1E-05 and HQ of 1.0 to facilitate identifying potential source areas that may require additional sampling to refine the extent of contamination. The decision rules for surface and subsurface soil sampling outlined in the PBA08 SAP are shown on Figures 4-1 and 4-2. Table 4-1 lists the chemicals with detected concentrations that exceed screening criteria in historical soil samples. In addition, the PBA08 SAP specified that all samples would be analyzed for explosives, 15% of total soil and sediment samples and collected within an AOC would be analyzed for the RVAAP full suite of analytes [i.e., TAL metals, explosives, propellants, (nitrocellulose and nitroguanidine), SVOCs, VOCs, PCBs, and pesticides], and all surface water samples would be analyzed for the RVAAP full suite of analytes. Sediment and surface water samples collected during the previous investigation were only associated with infrastructure (i.e., sumps and sewers) and not with ditches, so they were not used in the evaluation of this RI Report.

2) Table 4-1 presents the chemicals that were targeted for investigation under the PBA08 field investigation. Metals and PAHs were the only chemicals that exceeded the screening criteria in historical samples. Explosives were added to the sample collection suite based on historical operations knowledge.
3) Based on stakeholder agreement during the DQO process and SAP development, there was a requirement to have 15% soil and sediment sample population be analyzed for full-suite, regardless of the analytes that may be at the AOC due to historical usage. The full-suite samples for soil were randomly chosen and were not biased towards areas of highest potential contamination. Previous sampling events indicated only metals and benzo(a)pyrene exceeded screening levels in soil.
4) Samples collected for full-suite are denoted in the "Comments/Rationale" column of Tables 4-2 and 4-3. The corresponding location of that sample is presented in the "Station" column.
5) When a full-suite analysis was determined to be collected from a discrete soil boring, the full-suite analysis was performed for each soil sample interval (surface and subsurface) sent to the laboratory.

8. Pg. 4-3, Lines 23-29, Discussing VOC Sampling Location: The report indicates sampling location for VOC was randomly chosen; however, the report indicated bldg. PE-2 and bldg. PE-20 were used for solvent storage. In addition, an earlier investigation detected carbon tetrachloride in the ground water, in the monitoring well, in the vicinity of bldg. PE-2. Please discuss the rationale for not targeting VOC sampling locations at bldgs. PE-2 and PE-20.

Army Response: Clarification. Samples for VOC analysis were collected at former Building PE-2 (sample L10ss-038D) and Building PE-20 (sample L10ss-037D) as part of the Characterization of 14 AOCs project. Results for these samples will be presented in accordance with Comment 1. All VOC concentrations were less than laboratory reporting limits.

9. Pg. 4-4, Section 4.1.2, Subsurface Soil Sampling Rationale and Methods: Was any screening device used, such as a PID, on the borings for selection of sampling locations?

Army Response: Clarification. The approved SAP did not specify use of field screening instruments, e.g., "Field instruments (e.g. PID, FID, XRF) will not be used for the measurement of chemical concentrations or biased sample collection during the implementation." This information is also noted on page 4-13, lines 14-17 of the Load Line 10 RI Report.

10. Pg. 4-10, Section 4.2.1 and 4.2.2, Surface Water and Sediment Sampling: Was any historical information evaluated for the surface water and sediment sampling? Ohio EPA suggests the definitions for dry and wet sediment again be defined in this section.

Army Response: All historical information and data associated with Load Line 10 were assessed for usability in the RI. Sections 4.0 and 5.1.4 summarize the approach used to screen historical data and assess data usability as part of DQOs for PBA08 RI sampling efforts. Historical data that met DQOs were evaluated in this RI.

The definition for dry sediment and wet sediment, also located on page 1-3 lines 8-19, will be added to the beginning of Section 4.2 on page 4-10:

"For the purposes of this report, the term "surface soil" includes dry sediment. Dry sediment refers to unconsolidated inorganic and organic material within conveyances, ditches, or low lying areas that occasionally may be covered with water, usually following a precipitation event or due to snowmelt. Dry sediment is not covered with water for extended periods and typically is dry within seven days of precipitation. Dry sediment does not function as a permanent habitat for aquatic organisms, although it may serve as a natural medium for the growth of terrestrial organisms. Dry sediment is addressed the same as surface soil [0-1 ft below ground surface (bgs)] in terms of contaminant nature and extent, fate and transport, and risk exposure models. The term "sediment," as used in this report, refers to wet sediment within conveyances, ditches, wetlands, or water bodies that are inundated for extended periods of time. These definitions and terminology usage are consistent with the FWCUG Report (USACE 2010a)."

Regarding the additional feedback provided in the 8/11/14 memorandum:

1) Section 4 basically focuses on the samples collected during the PBA08 RI. The historical samples are presented in Section 5 (specifically Table 5-2). In addition, in response to General Comment 1, data from historical investigations will be presented in existing or new Section 5 tables.
2) Regarding adding the reference to the Technical Memorandum for the definition of sediment and dry sediment, the Technical Memorandum does not provide that distinction. That definition is provided in the FWCUG Report.

11. Pg. 4-13, Section 4.4.4, Laboratory Analysis: Please discuss if the detection limits, as stated in the FWSAP, were met.

Army Response: Agree. The text on page 4-14 has been revised as follows to clarify:

"In addition to these standards, the analytical laboratories were required to strictly adhere to the requirements set forth in the FWSAP and PBA08 SAP so that conditions adverse to data quality would not arise. Project quantitation level goals for analytical methods were listed in the QAPP. These levels were achieved or exceeded throughout the analytical process, with the exception of a few pesticide, PCB, and SVOC soil samples which were analyzed at diluted levels. These goals and exceptions are further discussed in Appendix C Data Quality Control Summary Report. Preparation and analyses for chemical parameters were performed according to the methods listed in Table 4-8. Additionally, soil geotechnical analysis for porosity, bulk density, moisture content, grain size fraction, and permeability were performed in compliance with American Society for Testing and Materials (ASTM) test methods."

12. Figures: Are Figures ES-2 and Figure 4-3 the same?

Army Response: Yes, Figures ES-2 and 4-3 are the same. The Executive Summary was written to be a separate, standalone summary of the report. As a result, some of the text and figures in the Executive Summary are the exact same as presented in the report.

13. Figure 5-5 and Figure 5-7, Concentrations of Organic SRCs in Surface Soil ISM Grid Samples (Fig. 5-5) and also Subsurface Soil (Fig 5-7): Please modify/add to the maps title for clarity, data is mostly SVOCs with some pesticides.

Army Response: Clarification. Figures 5-5 and 5-7 show all detected concentrations of organic SRCs in support of the text discussion for surface soil and subsurface soil organic contaminants (SVOCs, VOCs, Pesticides, PCBs). We do not recommend renaming the figures to indicate a focus on SVOCs and pesticides because VOC data are also presented on these figures. In addition, the figure name serves as a model for consistency in naming of organic SRC figures in other PBA08 RI reports.

14. Table 5-6, SRC Screening Summary for Surface Soil: Ohio EPA could not locate a discussion regarding "Minimum Detect," "Maximum Detect," and "Average Result" and there is no note area with the table for this information.

Army Response: Clarification. Section 5.1.2 discusses data reduction, summary statistics (minimum, maximum, average detects), and screening process to determine SRCs. Section 5.2.2 Contaminant Nature and Extent in Surface Soil discusses general trends regarding the various analyte groups. Where appropriate, maximum and minimum concentrations are discussed to explain the nature and extent of contamination. In addition, Figures 5-2 to 5-5 identify the SRC maximum concentration in red font.

15. Figure 5-6, Concentrations of Inorganic SRCs of Inorganic SRCs in Subsurface Soil: The legend states the shaded numerical values are "inorganic Background" but it is unclear what that means as different values are in the various shaded areas, so there is no consistent value provided.

Army Response: Clarification. The legend states that the shaded numerical value is "Concentrations Below Inorganic Background". If a chemical concentration is shaded, that concentration is below inorganic background concentration for that chemical.

16. Figures, general comment: As previous data was collected, it would be helpful if the Figures caption stated the date of the sampling collection(s) and if historical data included the date(s) and which investigation (such as 14 AOCs, etc.) the data was collected under.

Army Response: Clarification. On each Section 5 figure, the sample date is included at the top of each data box. Due to the information density on some of the figures, it is recommended to remain as is. Figures ES-2 and 4-3 were developed to distinguish samples collected during the PBA08 RI from those collected during historical investigations. As noted in response to comment 12, Figures ES-2 and 4-3 are the same. The Executive Summary was written to be a separate, standalone summary of the report. As a result, some of the text and figures in the Executive Summary are the exact same as presented in the report.

17. Volatile Organic Scan (VOCs): Was a full scan done for VOCs? It is unclear from Table 5-8, as the same 3 compounds are presented.

Army Response: Clarification. For sediment samples collected during the PBA08 RI at Load Line 10, a full scan for VOCs was performed. The only VOCs presented in Table 5-8 are those that were identified as SRCs.

Regarding the comment in the 8/11/14 memo, the text in Section 4.2.1 that describes the PBA08 RI surface water and sediment sampling methods clarify that full-suite analysis was performed.

18. Facility-Wide Sampling and Analysis Plan: Report states the revised February 2011 FWSAP was not used for the LL-10 RI report. Ohio EPA is assuming the FWSAP dated March 2001 was used. Please indicate if all forthcoming RI reports will use the same one and why the most recent version is not used.

Army Response: Clarification. The Facility-wide Sampling and Analysis Plan (FWSAP) dated March 2001 was used during the remedial investigation field activities at Load Line 10 in 2010, as that was the version available at the time. All data collected under the PBA08 RI followed the protocol for this March 2001 version of the FWSAP. The FWSAP was updated in February 2011 after the Load Line 10 remedial investigation field activities.

19. Pg. 6-5, Section 6.1.5, Regarding 2,4-DNT and Other Appropriate Areas: Please include in the discussion 2,6-DNT and the other isomers 3,4-DNT, 2,3-DNT, 2,5-DNT, and 3,5-DNT. Was 2,6-DNT always sampled with 2,4-DNT? Note: 2,4-DNT and 2,6-DNT were sampled in ground water with detections. Ohio EPA raised concerns regarding the possible presence of the other four isomers as even low detections of 2,4-and 2,6-DNT may result in higher levels of the other isomers. A weight of evidence was presented to Ohio EPA from the Army eliminating the possible presence of 3,4-, 2,3-, 2,5-, and 3,5-DNT isomers, based on historical evidence. A discussion regarding 2,4-DNT and 2,6-DNT and the other four isomers should be included for soil in all RI reports.

Army Response: 2,6-DNT and 2,4-DNT were analyzed as part of the explosives chemical suite. At Load Line 10, there were no concentrations of 2,6-DNT or 2,4-DNT above laboratory detection limits in soil, sediment, or surface water.

In addition, per an Army communication to Ohio EPA dated March 25, 2013, the Army provided scientific information explaining that "It is unnecessary to expand beyond the 2,4-DNT and 2,6-DNT isomers, and the proposed expansion has no additional value of being protective to human health and the environment at the former RVAAP." Ohio EPA responded on March 27, 2013 that "We have reviewed the summarized scientific information provided in the correspondence, which is sound, regarding the other 4 DNT isomers, which are not being sampled and analyzed." Accordingly, the explanation in Section 6.1.5 Explosives-Related Chemicals is appropriate and additional text to include the other four isomers is not warranted.

The following information will be added to Section 4.4.4 Laboratory Analyses, immediately before Table 4-8:

"… were performed in compliance with American Society for Testing and Materials (ASTM) test methods.

As presented in a March 25, 2013 letter from the Army to Ohio EPA, there is a distinction between production of DNT and TNT, and a facility that receives finished DNT or TNT product. A facility where DNT is manufactured will have the following isomers of DNT in the finished product: 76.49% 2,4-DNT, 18.83% 2,6-DNT, 0.65% 2,5-DNT, 2.43% 3,4-DNT, 1.54% 2,3-DNT, 0.040% 3,5-DNT (HSDB, 2004). During the production of TNT, lower melting isomers of TNT can occur as impurities; which would not degrade to the lesser DNT isomers (Zhao, Yinon. 2002). The former RVAAP did not manufacture/produce DNT or TNT (RVAAP 2013). The memo concluded that "Since the manufacturing of DNT and TNT did not occur at the former RVAAP; and with the degradation pathway of TNT understood, 2,4-DNT would be the likely DNT isomer present in media around the melt/pour buildings resulting from the degradation of TNT. Therefore, the current RVAAP Facility-wide SAP requires no change." In a letter dated March 27, 2013, Ohio EPA concurred with the elimination of analysis of remaining isomers (Ohio EPA 2013). As a result, the explosives and propellants presented in the FWSAP were analyzed in the PBA08 RI, including the 2,4-DNT and 2,6-DNT isomers associated with DNT and 2,4,6-TNT isomer associated with TNT."

New references to be added to the document:
RVAAP 2013. *DNT Isomers. RVAAP-66 Facility-Wide Groundwater. Ravenna Army Ammunition Plant, Ravenna, Ohio*. March 2013.
Ohio EPA 2013. *Ravenna Army Ammunition Plant, Portage/Trumbull Counties, DNT Isomers*. Ohio EPA ID # 267-000859-036. March 2013.

Background, General Comment: Background is mentioned numerous times throughout the LL-10 RI report; however, there is no discussion on how background issues were derived or what value tables from the Final RI Winklepeck Burning Grounds report were used. As the LL-10 RI report is a standalone document, Ohio EPA suggests a clear, concise summary discussion of how background soil values were derived, including the appropriate table(s). This could be included in the text as a separate section or as a

separate appendix. It should also be included in all forthcoming RI reports, as appropriate. Ohio EPA noted that sediment and surface water backgrounds were also calculated. As appropriate to each RI report, please approach each as above.

Army Response: Clarification. The Load Line 10 RI Report utilized the approved facility-wide background concentrations provided in the Facility-wide Cleanup Goal Report, derived as discussed in the Winklepeck Burning Grounds RI. Because the facility-wide background values are fully discussed in other documents accessible via REIMS and the public website, the Army feels it is adequate to reference the background study rather repeating the information in the Load Line 10 RI Report. See changes to background text per comment 2.

Surface Water and Sediment: It is confusing from the text of the LL-10 RI report if surface water and sediment are located on the AOC. Previous investigations reference surface water and sediments. For instance, the 14 AOCs "collected 19 surface water samples from (1) sumps and basins (12), from sanitary sewers (6) and basement structures (1). Other reports/investigations and the LL-10 RI report references surface water and sediment, which is contrary to the conclusion that surface water and sediment are not located in the AOC . The text is however confusing, and at some points indicates that surface water and sediment were within the AOC and that some screening values were exceeded. Please clarify the text throughout the document indicating the difference between surface water and sediment, and the soil and temporary runoff that was evaluated during the assessment and other definitions, as appropriate. Please define "dry" and "wet" sediments. Please plan on maintaining the same definitions and interpretations consistently throughout all AOCs and all forthcoming RI reports.

Army Response: Clarification. Section 3.7 Preliminary Conceptual Site Model explains that "Perennial surface water features with associated sediment are not present within Load Line 10. Surface water at Load Line 10 occurs as intermittent storm water runoff within natural and constructed drainage ditches or conveyances (Figure 3-1)." Surface water and (wet) sediment samples were collected as part of the PBA08 RI from intermittent conveyances and summarized in Section 5.0 Nature and Extent of Contamination. The discussion of sumps and basins, sanitary sewers, and basement structures from the 14 AOCs characterization report explains the location of the historical samples identified as "surface water" at Load Line 10 in that document. These water samples from physical structures were evaluated for appropriate use in the Load Line 10 RI. Basin, sump, and basement water samples were determined to be from structures and not used for evaluation of surface water and sediment conditions within conveyances on Load Line 10. Sewer line water samples are addressed separately in the Facility-Wide Sewers AOC RI/FS Report.

As explained in Section 1.3, the term "sediment" is used in this evaluation. "Sediment" refers to wet sediment within conveyance ditches, wetlands, or water bodies that are inundated for extended periods of time. In addition, "dry sediment" is evaluated as "surface soil". The definition of "dry sediment" is also provided in Section 1.3. As noted in response to Load Line 10-specific comment 10, these definitions and explanation will be put in Sections 4.2.1 and 4.2.2.

Pg. 6-28-30, Section 6.5.5-6.6, AT123D Modeling Results and Table 6-5: The report states "observed ground water concentrations from AOC monitoring wells are included in Table 6-5; however, it should be

noted that these wells may not exist near the sample location with the maximum concentration and should not be considered in direct correlation. The observed ground water concentrations were added for comparison, not for screening criteria. The distances to the downgradient receptors were based on the distance along the ground water flow direction to the closest surface body." A comparison to the unconsolidated well was not included. Did MW-006 have detected contaminants?

The modeling indicated various contaminants will exceed MCLs or RSLs at about 15 years or less, with peak concentrations occurring at approximately 25 years or less. However, the report states these chemicals should have already been detected in the existing ground water and, with the exception of 2,6-DNT, have not been detected in the existing ground water. The modeling results and predictions that constituents should have already impacted ground water and the lack of detected ground water contaminants, are problematic. Due to possible future ground water use as potable water, it is important that the modeling accurately assess the leachablity of contaminants from soil to ground water. The future location and depths of monitoring wells should be recommended in this document to accurately detect contamination directly related to flow direction and suspect areas within each AOC. The current monitoring well locations and depths should also be evaluated. An accurate assessment of contaminants in ground water is crucial to the FWGWMP. The undefined interaction between the facility-wide approach to ground water (and future ground water modelling), future surface water modeling, and site-wide sewers, as they relate to each AOC, are issues that must be addressed.

Are these models appropriate for continued use at RVAAP? Can the assumptions and limitations be changed to represent more accurate site conditions? Are there other models that would be appropriate and more accurate for the RVAAP? How are the specific locations with elevated contaminant levels within an AOC being evaluated to assess if the monitoring wells have been optimally placed (both vertically and horizontally) to accurately detect contaminants in ground water? How will the site-wide investigations interact with specific AOCs? These are just a few questions that need to be discussed. It is the understanding of Ohio EPA that the objective of the SEASOIL modeling and AT1230 modeling would give a definitive and accurate representation of soil leachability issues.

Army Response: Clarification. SESOIL and AT123D modeling have been successfully employed in multiple RIs at Camp Ravenna as predictive tools for potential soil to groundwater leaching and migration. The PBA08 RI work planning process included discussion of fate and transport evaluation and use of these modeling tools. The modeling tools are highly conservative and assume no chemical or biological degradation of contaminants. Where conservative modeling indicates various contaminants may potentially exceed MCLs or RSLs, available groundwater data were evaluated to determine if those contaminants were actually present. If modeling indicates that potential leaching should have already occurred, the modeling results are validated by examining actual groundwater concentrations. The Load Line 10 RI Report notes that some chemicals have potential to leach and modeling results were compared to groundwater data. These chemicals, with the exception of 2,6-DNT, were not detected in groundwater indicating the modeling was conservative. Detection of 2,6-DNT occurred 2009 at a concentration of 0.000089 mg/L, which was slightly above the EPA RSL; this chemical was not subsequently detected in 2010 or 2011 groundwater samples. Further groundwater studies at RVAAP AOCs are within the scope of the facility-wide groundwater investigation.

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

October 10, 2014

Mr. Brett Merkel
Army National Guard Directorate
ARNGD-ILE Clean Up
111 South George Mason Drive
Arlington, VA 22203

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Report
Remedial Response/Federal Facility
Portage/Trumbull Counties
267000859

SUBJECT: RAVENNA ARMY AMMUNITION PLANT, PORTAGE/TRUMBULL COUNTIES, REVISED RESPONSES TO OHIO EPA COMMENTS, DATED JULY 1, 2014, REGARDING THE REVISED DRAFT 2, REMEDIAL INVESTIGATION REPORT FOR SOIL, SEDIMENT, AND SURFACE WATER AT RVAAP-43 LOAD LINE 10 (DATED AUGUST 25, 2014), PROJECT ID # 267-000859-102

Dear Mr. Merkel:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Revised Responses to Ohio EPA comments, dated July 1, 2014, regarding the Revised Draft 2 Remedial Investigation (RI) Report for Soil, Sediment and Surface Water at RVAAP-43 Load Line 10," dated August 25, 2014. The original responses to comments were provided to Ohio EPA on July 24, 2014. These comments address Ohio EPA's global and specific comments.

The following are Ohio EPA responses to both "general" and "specific" comments. For consistency sake, the numbers remain the same.

GENERAL COMMENTS:

1. The response does not adequately address Ohio EPA's comment or concerns; however, there appears to be issues of organization and presentation of information necessary to support the RI conclusions for Ohio EPA's understanding. To have a comprehensive understanding of what the Army has relied upon to base their conclusions for the AOC, Ohio EPA needs to have a clear understanding of the following:

   A. The rationale for how the RI boundary is defined;

   B. A discussion of all previous reports/investigations that are relied upon for conclusions in the RI. Each historical report discussion should document the following to ensure appropriate conclusions were based upon all known information:

   C. identify areas of investigation (text and figure) and goal of each investigation (delineation, screening, etc.), discussion of historic operations or use (i.e., percussion element manufacturing, solvent storage, dry houses, canned primer storage, etc.) or in some cases there may have been multiple uses for different time

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periods; specific chemicals associated with all uses over time which could have impacted the AOC (i.e., VOCs, SVOCs, explosives & propellants, pesticides, metals, etc.); evaluation of historical sampling to determine if all appropriate sampling was completed (according to the use, were the correct constituents sampled? i.e., VOCs, SVOCs, etc.);

D. evaluation of historical analytical results relied upon (review narratives, QA/QC, etc.) to determine if they meet the DQOs, site conditions, and quality needs of the current project, provide a summary of the analytical data, and provide a table identifying the location in referenced reports where this information is located;

E. identify any data gaps and discuss (e.g., was horizontal and vertical contamination defined?). All potential sources (e.g., USTs and ASTs) must be included in the evaluation, as well as, asbestos and PCBs should be evaluated and considered in relation to NESHAPS and TSCA requirements and documented in the text.

A comprehensive discussion should be included to evaluate all findings of discreet sampling and ISM sampling; this evaluation should document sampling locations and their overlap for confirmation; sampling parameters and goals for each event; and sample quality and consistency across the various events to identify whether the data is of a compatible use. A map overlapping the historical use map and all ISM and discreet sampling locations relied upon for remedial conclusions should be provided. Additionally, site walkover documentation should be discussed to understand whether site conditions have changed over time.

The current organization of the report, which requires Ohio EPA to find referenced material from other reports and is unclear on what data was relied upon, has made it difficult to fully understand how conclusions were derived. It would be more transparent if reports document the history of investigations, identify and include all data relied upon for conclusions, note if or how conditions have changed over time that could impact the use of past data, and provide a concise evaluation of quality of the data used and the conclusions based from the data. In addition, the Army has indicated that due to contact deadlines, it will be imperative that the RI reports be processed in a timely manner. The contractor's assistance in addressing the information and structural concerns above will facilitate this goal.

2. Adequately addressed.

3. Adequately addressed.

4. Adequately addressed.

5. CERCLA Exclusionary Releases: While Ohio EPA concurs that there is an exclusion for materials that may provide a small level of contamination but are common anthropogenic sources, like asphalt, there needs to be clear support that no other contamination source exists that could impact the AOC for PAHs. In all AOC RI reports, there should be a clear discussion of sources including tanks, vehicle leakage, storage of materials, and why these items may not have contributed PAH contamination to the AOC. Did LL-10 operations use any lubricants or equipment that required oils, which would be a source for PAH contamination? Was there a large concentration of vehicle traffic that could lead to impacts of PAHs? These questions need to be documented to support this use of the exclusion, as well as, the level of PAHs in the area.

6. Adequately addressed.

7. Adequately addressed; however, the Army refers to the responses below in # 8 to address Ohio EPA's concerns.

8. Comprehensive AOC Approach: Ohio EPA understands that there are various AOCs at RVAAP that overlap or are media specific (such as ground and surface water). However, our concern is that when investigating an AOC there are no conclusions defining whether the AOC is expected to impact another AOC or media. An example conclusion would be: "*The LL-10 soils have been evaluated and based upon the highest concentrations found at the AOC, it is not expected that leaching to ground water pathway would impact the Groundwater AOC above clean up goals or act as a continuing source area to this AOC*". This comprehensive conclusion would be expected for all AOCs that overlap, including sewers and human health impacts to MMRP AOCs if worker protection would be necessary.

   Comprehensive AOC Approach; last bullet # 9: The response provides wording with regards to Page 1-3, lines 28-35, which does not appear to accurately reflect Ohio EPA's concern. First, the document for the sewers cited in this section has not been fully reviewed or approved by Ohio EPA, so, the NFA conclusion is not considered "necessary or needed". The draft document may be considered "recommended," but note that Ohio EPA has not approved this document at this time. Second, the conclusion, as noted above, should focus on LL-10's contribution to the sewers. Is there a concern that contamination at this AOC will provide a continuous source, if the sewers are left in place? If not, the AOC may not need to be further considered; however, if the answer is a maybe or yes, the report should document what action is recommended for the Sewers since "NFA" would not be appropriate with a continuous source.

SPECIFIC COMMENTS:

1. Adequately addressed.

2. Adequately addressed. The response indicates "....the locations of former buildings may not be surveyed using GPS." Ohio EPA suggests, if possible, GPS locations obtained for former buildings are recorded to ascertain location of basement or other bottom structures that may have been left in place for future consideration of these historical structures.

3. Adequately addressed; however, response indicates the "RI report does not include the historical RRSE data." All historical investigation and data should have been evaluated to determine if areas with detected contaminants should have been adequately evaluated. Please provide rationale for exclusion of all historical investigations/data in the RI report.

4. Adequately addressed; Ohio EPA agrees with the response; however, please ensure all appropriate historical/investigative information specific to LL-10 from the "14 AOCs Report" has been evaluated.

5. The rationale for sampling locations under the slab surface soils must be included in the RI report to support the conclusions in the RI. The response indicates discreet soil samples were analyzed for VOCs at locations of former buildings PE-2 and PE-20 (solvent storage). A summary of all information (narrative and data) from the 14 AOCs report(s) must be included to support the conclusions of the RI report. In addition, it appears L10ss-038D and L10ss-037D are identified without the "D" on Figure 4-3 and the legend does not include "discreet" sampling locations.

6. Comment previously addressed.

7. This response has not been adequately addressed. The Army states the information references back to the PBA08 SAP for determining locations and analytes; however, this does not provide a clear understanding on the rationale for the sampling as it applies to the RI report's conclusion. The comment below further clarifies why Ohio EPA has confusion since the information is missing in the RI report.

   The Army's response indicates metals and PAHs were the only chemicals that exceeded the screening criteria in historical samples. However, it appears that metals and PAHs were only sampled. Therefore, it is unclear if additional COCs could exist, if based upon all site related information. Additional discussion providing a clear development leading to conclusions would be helpful to understand decisions that were made.

   The Army response indicates 15% of soil and sediment samples were analyzed for full-suite and were randomly chosen. It is unclear if the samples included areas of highest potential contamination. If not, a discussion is needed to address whether there is the potential for additional constituents from the full-suite to exceed in those areas that were not sampled. Please discuss.

   Ohio EPA could not located L-10ss-092M on Figure 4-3. Please verify.

8. The text indicates sampling location for VOCs were randomly chosen. Please indicate if the text will be changed or deleted. Text also states carbon tetrachloride was detected in

the ground water in the monitoring well. Based upon this detection, is there a concern that a source area still exists at the area? Are there constituents remaining in soils or sediments that need to be addressed to eliminate the source to ground water? How will this information be transmitted to the FWGWMP?

9. The response indicates screening devices, such as PID, "will not be used for measurement of chemical concentrations or biased sample collection during the implementation." Screening devices are useful to indicate areas of potentially higher VOC contamination as the investigation moves to defining rate and extent of concentration. Please discuss the rationale for not using these devices and how random sampling will provide appropriate delineation and evaluation of AOCs for areas with suspected VOC contamination.

10. Adequately addressed.

11. Please discuss in the text and provide a table listing the constituents that the detection limits, as stated in the 2001 FWSAP, were not met during laboratory analysis. Please include the detect limit designated in the FWSAP and the actual laboratory detection limit. Please include rationale for inclusion or exclusion of the data. Please advise how the unmet detection limits relate to the cleanup standards. Please discuss how this inconsistency will be addressed. Will additional sample collection be needed to ensure areas meet cleanup goals?

12. Adequately addressed.

13. Adequately addressed; however, the maps grouping VOCs, SVOCs, pesticides, and PCBs all on one map is busy. For clarity sake, it would be easier for the reader if each group was addressed in a separate map.

14. Adequately addressed.

15. Adequately addressed.

16. Adequately addressed.

17. Adequately addressed. Please clarify in the appropriate section(s) of the text.

18. Adequately addressed.

19. As much discussion has transpired between the Army and Ohio EPA regarding 2,4-DNT and 2,6-DNT isomers and has been placed in the files, Ohio EPA is suggesting a paragraph be added in section 6.1.5 and all future RIs discussing the "weight of evidence" approach presented by the Army for not suspecting, and therefore eliminating, the isomers.

20. Ohio EPA still has the following concerns:

    A. As a stand-alone document, the text and tables should support the elimination of certain chemicals to support the conclusions of the RI. As the background levels

are used to eliminate COCs, there should be a brief discussion in the report text and these values should be included in any tables documenting the standards used for comparison/elimination. This should be included in all forthcoming RI reports.

B. Sewer line water samples applicable to LL-10 should be discussed in the RI report to document no impacts to the sewers.

C. It appears modeling data is being compared to Ground Water monitoring data to support the conclusion. Please discuss how the ground water data meets the quality parameters of the model, such as, is the well construction adequate for comparison in the model, do the location and depth of the wells provide appropriate data to support conclusions of the model? Any data provided in models should be supported and be appropriate for the goals of the model.

Ohio EPA is open to discussing the comments in either a meeting or conference call. Please call me at (330) 963-1207, if you have any questions on the above.

Sincerely,

Vicki Deppisch

Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvr

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