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DAVE MARTIN
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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

January 11, 2011

Thomas A. Ladd, Director
Environment and Safety Directorate
U.S. Army White Sands Missile Range
White Sands Missile Range, New Mexico 88002-5000

**RE: NOTICE OF DISAPPROVAL
RCRA FACILITY INVESTIGATION REPORT FOR THE
STALLION RANGE CENTER
FORMER FIRE FIGHTER TRAINING AREA (SWMU 162)
WHITE SANDS MISSILE RANGE (WSMR)
EPA ID# NM 2750211235
HWB-WSMR-10-002**

Dear Mr. Ladd:

The New Mexico Environment Department (NMED) has received the U.S. Army White Sands Missile Range (the Permittee) *RCRA Facility Investigation Report for the Stallion Range Center Former Firefighter Training Area (SWMU 162) White Sands Missile Range, New Mexico* (Report) dated August 2010. NMED has reviewed the Report pursuant to Section I.L of WSMR's Resource Conservation and Recovery Act (RCRA) Permit and hereby issues this Notice of Disapproval (NOD). The Permittee must address the following comments.

COMMENT 1

In Section 5 (Conclusions), page 21, first sub-bullet, the Permittee states "TPH DRO [Total petroleum hydrocarbons – diesel range organics] was present above the Residential SSL in the samples collected from boring SB-006 in the 0.5 to 1 ft bgs, 4 to 5 ft bgs, and 8 to 9 ft bgs intervals." The Permittee provides no further discussion about these exceedences. The Permittee states further, in Section 5, page 21, second bullet, that "[t]he only constituent detected at concentrations above the DAF 20 value was arsenic." Given that there is no DAF 20 value for DRO, the Permittee cannot discount the exceedences of DRO at the SB-006 location based on

this observation.

Also, the Ground Penetrating Radar (GPR) reports indicate that debris was present in the subsurface at this particular location, and therefore could be a potential source of contamination. The Permittee must submit a work plan that includes further investigation of the debris such that all contamination present at concentrations greater than screening levels is removed [see Table 2a in *NMED Total Petroleum Hydrocarbon (TPH) Screening Guidelines (10-2006)*].

COMMENT 2

In Section 5 (Conclusions), page 21, second bullet, the Permittee states “[b]ased on the very shallow exceedences of DAF 20 and UTL relative to the very deep occurrence of groundwater at approximately 190 feet, there is little or no risk that the arsenic in the shallow soils represents a threat to the groundwater.” This additional contaminant exceedence may be related to the debris at this location indicated by the GPR report. Further investigation must therefore be conducted at this location. The Permittee must propose to remove the sources of contamination in the work plan in order for the site to qualify for a corrective action complete determination (see Comment 1).

COMMENT 3

In Section 4.4 (Statistical Evaluation Results), third paragraph, the Permittee states that “...reported concentrations for arsenic, barium, cadmium and lead in sample SB-006 (0.5-1) and lead in sample SB-005 (4-5) were considered to be outliers and were removed from UCL data sets, consistent with USEPA guidance, as described in Appendix F.” The intent of the EPA guidance is not to allow localized “hot spots” containing contaminants at concentrations greater than cleanup levels to be overlooked. Address the exceedences at location SB-006 and the associated debris shown in GPR report. Other exceedences at this location shall not be considered outliers (see Comments 1 and 2).

COMMENT 4

In Appendix F (Statistical Evaluations), page 4, fourth paragraph, the Permittee states that, “Table 3 shows that the UCL for each metal is less than the UTL.” This is not true for arsenic and lead in the 0.5 to 1 ft bgs categories. Revise the language in Appendix F of the Report to reflect this. This same table (Table 4 of the main Report) is addressed correctly in Section 4.4 (Statistical Evaluation Results).

COMMENT 5

In Table 2 (Summary of Soil Sample Analytical Results) of the Report, the Permittee reports that chrysene was detected in SB-001 at the 4-5 foot depth interval at a concentration of 0.0153 mg/kg. Chrysene is a polycyclic aromatic hydrocarbon (PAH), and so this datum must be included on Figure 6 (PAH Concentrations in Soils). Revise Figure 6 to include this datum, and revise the Report accordingly.

COMMENT 6

In Table 4 (Statistical Evaluation Results) of the Report, the Permittee presents the upper confidence limits for several groups of data: for the entire data set, data from samples obtained from 0.5 to 1.0 feet below ground surface (bgs), and sample data from soils below four feet bgs.

- a. Soil samples were collected to a depth of 15 feet bgs. Clarify whether the “whole data set” UCL is representative of all these data or whether it is reflective only of data from zero to ten feet bgs.
- b. It is not clear what the UCL for data below four feet bgs was intended to be used for, since it does not represent any exposure interval used in risk assessments.
- c. There does not appear to be an UCL for the construction worker and residential receptors from zero to 10 feet bgs.
- d. No input/output files from ProUCL were provided with the report to allow verification of these data. Include these data in the revised report.

COMMENT 7

The general layout of the document makes it difficult to complete a thorough review. For example, page numbers are missing that should correspond to pages cited in the Table of Contents. Consider leaving out non-detect data in summary tables in future submittals, and double-siding document pages to reduce the size of the document. No revision is required. Apply the summary table requirements listed in Appendix 7, section 7.3.12 (Tables) of the Permit to future submittals.

COMMENT 8

A risk assessment is not appropriate if the site contains only limited areas of contamination (hot spots) that are easily accessible for removal or other types of remediation. Remove Appendix E (Risk Assessment Reports) from the Report and propose to remove the contaminated soils (see Comments 1 and 2).

The following comments are specific to Appendix E (Risk Assessment Reports). Since this section must be removed from the revised Report, review and implement the following comments for future risk assessment reports conducted for the Facility. No revisions are required for Appendix E for this Report.

COMMENTS SPECIFIC TO APPENIX E (RISK ASSESSMENT REPORTS)

COMMENT 9

The Human Health Risk Assessment (HHRA) must be modified to address the increased levels of TPH-DRO within the 0-10 foot depth interval under the residential scenario. The current HHRA includes site concentrations only from samples collected from the 0-2 foot depth interval. Residential receptors are expected to engage in activities such as landscaping, yard work, and outdoor play (NMED, 2009) and could be exposed to deeper soil. As such, site concentrations from samples collected from the 0-10 foot depth interval must be utilized for the residential scenario. Additionally, current residential hazards from exposure to anthracene, benzo(g,h,i)perylene, and pyrene have been underestimated, and the current risks and hazards do not include exposure to acetone and chrysene, which were detected in the 0-10 foot depth interval.

COMMENT 10

The Permittee uses a general approach to determine whether site concentrations for compounds such as arsenic were elevated compared to background by comparing the calculated 95 percent of the mean upper confidence level (UCL) for site data to the upper tolerance level (UTL) for background data. This is an incorrect approach. The use of an appropriate statistical method depends upon the environmental parameter(s) being estimated or compared. The UCL is an estimate of the mean and is representative of a central tendency measure. The UCL is used for comparisons to a cleanup standard. The UTL is a not-to-exceed value and is used for point-to-point comparisons. Because the UCL is not a point estimate, it cannot be used as an estimate of an individual site observation for comparison to a background threshold value. Specifically, only point-by-point site observations (such as the maximum detected site concentration) should be compared with a background threshold value (UTL). Since all metals were retained in the risk assessment, a revision of the comparison of site data to background is not necessary. More detailed information on how to compare site data to background may be found in the "User's Guide for ProUCL."

COMMENT 11

The screening level assessment resulted in excess risk/hazard for the residential scenario. It appears a more "refined" assessment was conducted using all default assumptions and inputs from the NMED Soil Screening Guidance. It is not clear from the discussion in the text or the summary tables what site-specific assumptions were used to "fine-tune" the exposure analyses for these two receptors. Provide a more detailed discussion of what refinements and site-specific data were applied in these calculations.

COMMENT 12

Include a qualitative discussion of inhalation of VOCs by the construction worker in Appendix E. Inhalation of volatile organic compounds (VOCs) via the indoor vapor intrusion scenario was assessed for the resident and indoor worker. A construction worker would also potentially inhale vapors in outdoor air. It is generally accepted that unless there is a trenching scenario where vapors could pond, the indoor air pathway is protective of the outdoor air pathway.

COMMENT 13

The Permittee failed to further evaluate Total Petroleum Hydrocarbon - Diesel Range Organics (TPH-DRO) in the refined HHRA. TPH-DRO was detected above the residential screening level in sample SB-006. A screening level hazard was calculated as shown in Table HHRA-3, resulting in a hazard quotient (HQ) of 1.5, which is greater than the target HQ of one. If the correct soil interval had been utilized (0-10 foot depth interval) the HQ would be much greater than 1.5. As noted in Comment 5, TPH-DRO should be evaluated under the residential scenario. Address the HHRA (screening and refined) accordingly as part of further corrective action, if residential screening levels are not achieved at the site.

COMMENT 14

The refined ecological risk assessment included the use of the lower of the arithmetic average concentration. Simple substitution methods (use of one-half the sample quantification limit) were also applied in determining the average concentrations. This is not an acceptable method for refining a risk assessment. The following comments must be addressed in future risk assessment reports:

1. Average concentrations are not an acceptable exposure point concentration (EPC). Unless a point-to-point comparison is being made, only the maximum detected concentration or the 95 percent UCL should be applied as EPCs in risk assessments.
2. Use of simple substitution methods are not recommended by the Environmental Protection Agency (EPA). According to the "ProUCL User's Guide", "*It should be noted that for data sets with NDs [non-detects], the DL/2 substitution method has been incorporated in ProUCL 4.0 only for historical reasons and also for its current default use. It is well known that the DL/2 [detection limit] method (with NDs replaced by DL/2) does not perform well (e.g., Singh, Maichle, and Lee (EPA, 2006) even when the percentage of NDs is only 5-10%. It is strongly suggested to avoid the use of DL/2 method for estimation and hypothesis testing approaches used in various environmental applications. Also, when the percentage of NDs becomes high (e.g., > 40-50%), it is suggested to avoid the use of parametric MLE methods. For data sets with high percentage of NDs (e.g., > 40%), the distributional assumptions needed to use parametric methods are hard to verify; and those parametric MLE methods may yield unstable results.*" Use of simple substitution may also result in an underestimation of the UTL or UCL. ProUCL provides several other methods for handling censored data,

including regression on order statistics (ROS). As the use of simple substitution tests for censored data are not an accepted practice, determination of the exposure EPC for censored data sets should be revised to reflect current guidance.

3. Refinement of an ecological risk assessment may include the use of area use factors (AUFs), population use factors, and/or use of lowest-observed adverse effect levels (LOAELs).

COMMENT 15

In Section 2.3.3 (Toxicity Assessment), the Permittee applies an outdated hierarchy from 1993 for toxicity data. This hierarchy no longer represents the EPA-and NMED-preferred hierarchy of toxicological data. For example, National Center for Environmental Assessment (NCEA) data is no longer appropriate for use in risk assessments as these data have not undergone an extensive peer review process. The current hierarchy of toxicological data is summarized in Revision 5 of the NMED Soil Screening Guidance.

COMMENT 16

In Table HHRA-1, the Permittee does not list NMED (2009) screening levels for 1,2-dibromo-3-chloropropane, despite its listing in NMED (2009). It is noted that this does not affect the results of the HHRA as this chemical was not detected at Stallion Range FFTA and screening levels for this chemical were not utilized in the HHRA. The Permittee must nevertheless make note for future submittals.

COMMENT 17

In Table HHRA-5, the criterion the Permittee uses for determining whether detected constituents are considered to be "volatile" is unclear. For example, fluoranthene, benzo(g,h,i)perylene, chrysene, and pyrene were detected in the total soil vadose zone but were not considered as "volatile" and were not evaluated for the vapor intrusion pathway. Other sources, including NMED (2009) and the User's Guide to the Johnson and Ettinger Model, indicate that these are considered to be VOCs. Clarify the criteria that were used to determine the selection of volatile organics considered for this pathway, and revise future Risk Assessment Reports to include this change.

COMMENT 18

In Table HHRA-6, an oral reference dose (RfDo) is not listed for chromium. In addition, a residential hazard quotient (HQ) in Table HHRA-23 was not calculated for chromium. Oral RfDs are available for chromium III and for chromium VI, as published in EPA's integrated risk information system (IRIS). Include chromium data in future Risk Assessment Reports.

COMMENT 19

In Tables HHRA-14, HHRA-15, and HHRA-23, the subtitles state: "High Energy Laser Systems Test Facility (HELSTF), U.S. Army White Sands Missile Range." This risk assessment does not include the evaluation of this facility. The Permittee must delete this part of the subtitle. Update tables to reference the correct sites.

COMMENT 20

Table HHRA-18 does not include the following physical and chemical properties: normal boiling point, critical temperature, and enthalpy of vaporization at the normal boiling point. These physical and chemical properties are used to calculate the indoor air concentration in the Johnson and Ettinger model. Include these physical and chemical properties used to estimate vaporization of VOCs into indoor air via the Johnson and Ettinger model on Table HHRA-18.

COMMENT 21

In Table HHRA-19, the Permittee lists acetaldehyde under the category of "Volatile Organics". List acetone here instead, as acetone was the only VOC detected at the site. Reference the correct constituents in future reports.

COMMENT 22

Table HHRA-24 does not include direct contact with soil for the future commercial/industrial worker. Cumulative risk/hazard for all potential exposure scenarios must be evaluated when assessing total risk/hazard in future Risk Assessment Reports.

The Permittee must address all comments contained in this letter and submit a revised Report. The cover page must indicate that the submittal is a revision and was prepared for NMED. The revised Report must be accompanied with a response letter that details where all revisions have been made, cross-referencing NMED's numbered comments. The Permittee must also submit an electronic copy of the revised Report with all edits and modifications shown in redline-strikeout format. The revised Report must be submitted to NMED no later than June 30, 2011.

The Permittee must submit a work plan describing proposed additional work as directed in Comments 1 and 2 no later than August 31, 2011. Follow the format in Permit Section VI and Appendix 7.

Mr. Ladd
January 11, 2011
Page 8

If you have any questions regarding this letter, please contact Shannon Duran at (505) 476-6058.

Sincerely,



James P. Bearzi
Chief
Hazardous Waste Bureau

cc: S. Duran, NMED HWB
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File: WSMR 2010 & Reading File
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