Marine Corps Base Camp Lejeune
Restoration Advisory Board Meeting Minutes

RAB Meeting: October 23, 2007

ATTENDEES:
Robert Lowder/Camp Lejeune
Andrew Smith/Camp Lejeune
Rodger Jackson/NAVFAC Atlantic
Gena Townsend/USEPA Region 4
Randy McElveen/NCDENR
Joe Colella/Shaw
Matt Louth/CH2M HILL
Kim Henderson/CH2M HILL
Christopher Bozzini/CH2M HILL
Donna Laudermilch/CH2M HILL
Laura Bader/RAB Co-Chair
Jerome Ensminger/RAB Member
Thomas Mattison/RAB Member
Leonard McAdams/RAB Member
Jennifer Hlad/Jacksonville Daily

FROM: Donna Laudermilch/CH2M HILL

DATE: December 3, 2007

LOCATION

Coastal Carolina Community College, Business Technology Building, Room 101 in Jacksonville, North Carolina

MINUTES

6:00 PM

I. Welcome and Introductions

II. IR Site 88 (Former Base Dry Cleaners) Building 25 Site Update

Objective: The purpose of this agenda item was to provide an update on the status of investigation activities at Site 88 (the former Base dry cleaners site). This discussion was led by CH2M HILL representative, Mr. Chris Bozzini.

Overview: Site 88 (Operable Unit No. 15) primarily refers to Building 25, which operated as a dry cleaning facility from the 1940s until January 2004. The building was demolished in 2004. The nearest water supply well is 1.5 miles upgradient of the site; and groundwater at Site 88 flows southwest towards the river. The RAB reviewed a summary of historic investigations conducted between 1997 and 2007. Most recently, a Comprehensive Remedial Investigation (RI) was conducted between 2005 and 2007, which concluded that:

- The plume length is approximately 2,300 feet long;

- The plume is approximately 1,250 feet from the river;
- Contamination is present at various depths with the highest concentration present at 75 to 100 feet below ground surface (bgs);
- The highest concentration is located beneath the PMO parking lot;
- Concentrations are below regulatory standards at a depth of 160 to 170 feet bgs;
- There is a clay confining unit present at about 180 feet bgs; and
- Natural attenuation is occurring.

The RAB reviewed a figure depicting the site conceptual model, and then reviewed three-dimensional images depicting nature and extent of contamination. There are three aspects of the plume at Site 88: a source area, high concentration at deeper depth (greater than 1,000 parts per billion [ppb] at 75 to 100 feet bgs), and low concentration dissolved plume (0 to 100 ppb at 50 to 75 feet bgs). As part of the RI, a human health risk assessment (HHRA) was conducted, which concluded that groundwater at the site should not be used for potable or non-potable uses.

A source area remediation was conducted in 2005 as a non-time critical removal action (NTCRA), and the site was turned into parking lot. Tetrachloroethene (PCE) was reduced in the source area by 98% and 99.6%; and PCE was reduced in nearby downgradient wells by 89% and 98%.

The next phase for the site is to complete a Feasibility Study (FS), which will focus on three separate areas:

- Source area - small area outside the soil mixing area
- High dissolved concentration – in the PMO area
- Low dissolved concentration - west of McHugh Blvd

The schedule is as follows:

- Draft Feasibility Study – December 2007
- Final Feasibility Study – March 2008
- Draft Proposed Remedial Action Plan – May 2008
- Final Proposed Remedial Action Plan – August 2008
- Draft Record of Decision – November 2008
- Final Record of Decision – March 2009

During this discussion, Mr. Ensminger asked how often vapor intrusion samples are being collecting in the building above the plume. Base representative Mr. Lowder explained that they do not anticipate any vapor intrusion issues in the building due to the depth of the plume, but there is a project underway to assess base-wide vapor intrusion. This project will follow the draft EPA guidance, assessing any structure within 100 feet vertically or horizontally of a plume. Mr. Ensminger then asked whether pump and treat would be a feasible alternative for addressing groundwater contamination at Site 88. The Base representative explained that the Navy feels that pump and treat systems are not cost-effective and should only be implemented as a last resort. Mr. Ensminger also suggested iron shavings; however CH2M HILL representative Mr. Bozzini explained that the depth of the contamination makes implementation difficult.

Ms. Bader questioned how quickly the plume was moving toward the river. The CH2M HILL representative stated that groundwater flow is approximately 30 to 40 feet per year; however contamination may not move at the same speed. Further, the source area has been treated, so new contamination is not migrating into the area.

III. Range Environmental Vulnerability Assessment (REVA) Update

Objective: The purpose of this agenda item was to provide an update on the status of the Range Environmental Vulnerability Assessment (REVA). This discussion was led by Base representative, Mr. Bob Lowder and handouts were provided.

Overview: The Base representative briefly reviewed the background and objectives of the REVA program. The Military Munitions Response Program (MMRP) is a program for assessing closed ranges; while REVA is the Marine Corps assessment vehicle for operational ranges, which is being conducted in response to Department of Defense Instruction 4715.14. The objectives of REVA are to:

- Assess the potential for munitions constituents (MC) to be released from operational ranges to off-range areas.
- Provide a snapshot in time of potential MC contamination.
- Identify potential impacts of the potential MC release to human health and the environment.

The RAB then reviewed a figure showing the primary impact areas on Base that are currently being assessed under REVA including the G-10 impact area, K-2 Impact Area, and the Rifle Range area. If assessments identify contaminant migration off the range areas (or the potential for off-site migration) in these impact areas, then the Base will go back and assess all operational ranges.

The REVA process at these sites includes:

1. Conduct a site visit (completed on 10/10/07) to collect all readily available data and information regarding the operational range areas
2. Develop the conceptual site model (CSM)
   - Provides description of physical conditions of the operational range area
   - Provides summary of military munitions use and potential MC loading
   - Provides standard means to summarize and display data
   - Provides preliminary migration pathways and potential receptors.
3. Conduct Modeling
   - Surface water modeling
   - Groundwater modeling
   - Performed on ranges most likely to cause impact of concern (e.g., most heavily used, in sensitive setting)
   - Used to determine whether further assessment is needed
4. Conduct supplemental sampling for indicator munitions constituents

- RDX
- TNT
- HMX
- Perchlorate
- Lead

5. Document Findings

   - Prepare a report when modeling indicates no MC concentrations exceeding trigger values at operational range boundaries
   - Prepare a decision paper when modeling indicates MC levels are higher than a trigger value at one or more operational range boundary

Other than lead, most of the MCs do not have established maximum contaminant levels (MCLs). However, preliminary remediation goals (PRGs) have been established for most of the MCs, so Headquarters Marine Corps (HQMC) is using the most stringent value available now as the trigger value.

The RAB then reviewed the REVA flow chart and the assessment protocol for Small Arms Ranges, where the main concern is lead migration.

If follow-up assessment is deemed necessary, the following may be implemented: geological studies; pumping well tests; soil studies to refine specific modeling parameters; and collection and analysis of samples for all MC, not just indicator parameters.

To date, the following steps in the REVA process have been completed:

- K-2 and G-10 Impact Areas:
  - Phase I - Pre-site visit data collection & analysis (7/6/05)
  - Phase II - Site visit data collection (10/23/06)
  - Extended Phase II – sampling (scheduled for 11/07)
  - Phase III – data analysis and vulnerability assessments
- Rifle Range
  - Phase I – Pre-site visit data collection and analysis (4/26/07)
  - Phase II – Site visit data collection (scheduled for 12/07)
  - Phase III – data analysis and vulnerability assessments

Part of REVA is determining whether there is an interaction between the surficial and Castle Hayne aquifers for modeling purposes. To help make this determination, all Base potable water supply wells were sampled for MC in April 2004. Perchlorate was detected at a concentration of 9 ppb at one single well near the Berkley Manor area, where there are no suspected sources. Two subsequent sampling events were conducted at this well and perchlorate was non-detect both times. Additionally, samples are collected on a monthly basis from the five water treatment plants (WTP) on Base. In April 2005, RDX was detected at a concentration of 1.2 ppb at the New River Air Station WTP; and TNT was detected in trace amounts at both the New River Air Station and Rifle Range WTPs. All subsequent monthly sampling events have been non-detect for these compounds.

During this discussion, Mr. Mattison asked whether the Rifle Range area has ever been cleaned up. Base representative Mr. Lowder stated that a project was conducted in 2005/2006 to sift the top soils in the Rifle Range impact area in order to reduce the potential for leaching. Additionally, the Stone Bay aquatic assessment was completed in 1998/1999 to determine if lead was leaching enough to effect human health or the environment. The study concluded that it was not leaching. Mr. Mattison then asked whether a berm could be built in the Bay. Base representative Mr. Lowder indicated he has requested installation of bullet traps for each range; however, the traps are extremely expensive to install.

Mr. Ensminger then asked when the EPA is going to create MCLs for MCs. The EPA representative stated that it wasn't clear, although she knows they've been working on an MCL for perchlorate for quite a while. Once the EPA develops regulatory limits they go through a 10 to 15 year review process; however in the absence of MCLs, they will use risk assessment numbers to develop PRGs.

IV. IR Site 69 Brief

Objective: The purpose of this agenda item was to provide an update on the status of investigation activities at Site 69. This discussion was led by CH2M HILL representative, Mr. Matt Louth.

Overview: Site 69 (OU 14) covers 14 acres in a remote portion of the Rifle Range area west of the New River. The site was historically used for disposal of solvents, pesticides, polychlorinated biphenyls (PCBs), chemical agent identification sets (CAIS) from the 1950s to 1976. The project chronology at Site 69 is:

- 1980-1981 – Radiation survey and soil sampling conducted (radioactivity was not detected above average natural concentrations)
- 1981 – Site was identified
- 1984-1986 - Confirmation study conducted
- 1990 – Fence erected
- 1991 – Supplemental investigation completed
- 1996 – Remedial Investigation completed
  - The primary contaminants of concern (COCs) were identified as cis-1,2-dichloroethene (cis-1,2-DCE) in groundwater.
  - No soil COCs were identified.
  - Volatile organic compounds (VOCs) were detected in on-site ponded surface water.
  - Potential chemical warfare materiel (CWM) degradation product detected in surface soil and sediment.
- 1996-1998 – Groundwater Treatability Study completed (in-well sparging to treat VOCs).
- 1998-2005 - Groundwater long-term monitoring (LTM) conducted. The LTM Optimization Report recommended discontinuation of the program due to ongoing investigation.
- 2000 – Interim Record of Decision (IROD) approved for monitored natural attenuation (MNA) and land use controls (LUCs).

- 2005 – Due to a request by the Onslow County commissioners, the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Water Quality (DWQ) performed split surface water and sediment sampling with the Base in waters near IR Sites 68 and 69. DWQ recommended no further sampling and no advisory to be issued.
- 2007 – Radiation survey was conducted at the location within Site 69 suspected of being a dump site for the Naval Medical Field Research Lab (NMFRL). Radioactivity was not detected at higher than average natural concentrations.

The RAB reviewed figures depicting VOCs in groundwater between 2004 and 2005. Groundwater flow at the site is generally radial, but predominantly headed toward the river. The plume is approximately 400 feet in length, groundwater flow at the site is 40 to 50 feet per year, and the distance from the plume to the river is approximately 1,200 feet. A review of the VOC trends in the monitoring well with the highest contamination (MW15IW) shows that TCE, cis-1,2-DCE, and vinyl chloride concentrations have remained fairly constant.

A human health risk assessment (HHRA) was conducted as part of the RI, which identified no risks based on current land use and no potable groundwater use. The ecological risk assessment (ERA) identified no risks for terrestrial and aquatic receptors.

The site is covered by the IR program (for VOC release) and MMRP program (due to suspected CWM). The Partnering Team is working towards a final Record of Decision (ROD) and closure of the site under the IR program (currently under an IROD). The site is part of UXO-02 (Unnamed Explosive Range) being addressed under the MMRP.

The next steps for Site 69 include submittal of the Work Plan to the Partnering team to complete an advanced geophysical investigation, install additional monitoring wells, and conduct monitoring. To conduct field work at the site a Chemical Safety Submission (CSS) needs to be completed. MARCORSYSCOM approves the CSS and then NOSA reviews it. Once field activities are finished, the RI will be updated and the FS will be completed.

During this discussion, Mr. Ensminger stated that while he was at the NBC School in 1970; live mustard agent was used in training. Vehicles would be contaminated and then they'd have to decontaminate them in full gear. Mr. Ensminger questioned whether the mustard gas from this training end up at Site 69. The Base representative explained that would be part of the CSS and the investigation. The Army will be coming to Site 69 the second week of November to assess Sites 41, 74, and 69 in order to provide an estimate on the level of effort, cost, and schedule to clean up the sites.

V. IR Site 93 Update

Objective: The purpose of this agenda item was to provide an update on the status of remediation activities at Site 93. This discussion was led by Shaw representative, Mr. Joe Colella.

Overview: The RAB reviewed a figure showing the location of Site 93, which is located adjacent to Building TC-942 at Camp Geiger. The contaminants of concern are chlorinated solvents, which were discovered in 1993 during removal of an underground storage tank

(UST). Contamination at the site exists to a depth of 16 feet, groundwater flow is northeast towards Edwards Creek, and groundwater is shallow (1 to 4 feet bgs).

The remedy selection process is as follows:

- A Feasibility Study for Site 93 was completed by CH2M HILL in November 2005.
- Groundwater models showed that North Carolina groundwater quality standards could be met within 7 years in the source area versus 14 years with a no action approach.
- ISCO using potassium permanganate was selected as the appropriate remedy (to decrease the remediation time).

The RAB reviewed a figure of the treatment area, which includes:

- 200 injection points, spaced 10 feet apart.
- Injection points installed 16 feet deep with 10 feet of screen.
- Monitoring wells installed outside of the treatment area to a depth of 20 feet.

In February 2007, the system was temporarily shut down because wet weather had raised the water table, resulting in daylighting of the permanganate. Following shut down, groundwater samples were collected, a pump test was performed, and alternate delivery methods were evaluated. The recommended alternative included dewatering to lower the groundwater table, mixing the dewatered groundwater with dry reagent, and re-injecting into the ground. In June 2007, the mixing equipment and dewatering system were set up. Groundwater levels were found to be three feet lower than they were in January 2007. In mid-June 2007, Shaw began to operate the system. The Team reviewed a figure showing the injection-dewatering well set up.

Through October 2007, Shaw has moved the dewatering system across the site once and is about halfway through the second cycle. Three rows are treated at a time, which includes approximately 15 injections points and 15 dewatering wells in each set-up. The model was based on injecting at 1 gallon per minute (gpm); however, the system is currently operating at 0.5 gpm for 9 hours per day (injecting about 1,550 gallons per day). This injection rate is about a 50% improvement than without dewatering. Even with the new setup, they are continuing to experience day lighting. The system is still operating slowly, about 20% of the design model rate.

The RAB reviewed concentration trends over the course of injections, which show a decrease in trichloroethene (TCE) and tetrachloroethene (PCE), while dichloroethene (DCE) is relatively stable and vinyl chloride is increasing. These trends are similar in monitoring wells within the treatment area, as well as downgradient and upgradient of the treatment area.

As of mid-October, Shaw has injected 198,000 of the 392,000 gallons (approximately 51%). Data indicates contamination levels are decreasing within the treatment zone.

VI. Additional Topics

During the RAB meeting, Base representative Mr. Lowder informed the RAB about two issues that have been addressed since the last meeting. The first issue involves the PT-37 compound area (IR Site 19 & 20), where beta-buttons were historically found in a pit. A radiation survey was recently completed, and the report should be released from RASO in the next few days. Based on historical information as well as recent and previous radiation surveys conducted, there is no radiation exposure hazard for personnel working in these areas. Once the final reports are released, an update will be provided to the RAB.

The second issue involves modeling data provided by ATSDR associated with the ABC Cleaners site. ATSDR's models, which were not based on sampling data, suggested contamination was present under the Tarawa Terrace elementary school. As a result, the Base initiated sampling and involved the EPA to collect split-samples. Sampling included groundwater, soil, and soil vapor sampling; however contamination was not identified. Indoor air sampling was also conducted at the elementary school and Base housing. The Base decided to conduct indoor air sampling, although the EPA guidance does not require it if there is no source. The indoor air sampling identified PCE or TCE in cabinet areas or the boiler room where chlorinated solvents are stored/used for cleaning. A report will be issued in the next few days.

VII. Next RAB Meeting

The Next RAB Meeting will be **Tuesday, January 22**, **2008 6:00 PM – 8:00 PM**. Mr. Bob Lowder will secure a location for the meeting and send the information to the RAB members. Agenda topics for the January RAB meeting will include: a REVA update, Tarawa Terrace sampling, radiological survey, Site 89, and update on what Army has to say regarding Site 69.