

**Ravenna Army Ammunition Plant  
Restoration Advisory Board (RAB)  
Meeting Minutes  
May 16, 2001**

**1. Call to Order and Reading of the Minutes**

The meeting was called to order by Lt. Col. Tom Tadsen at the Paris Town Hall, Paris, Ohio at 6:13 p.m. Secretary Denise Gilliam took attendance with 19 present, 3 excused and 3 absent (Mr. Edward Boles, Mr. Kevin Cooper, and Mr. Richard Walton). Changes to the minutes include Mr. Jay Abercrombie and Ms. Barbara Andreas listed as absent in the Feb. 14 minutes were actually excused. Ms. Rachael Craig asked that the minutes be amended to reflect that her initial comments on chromium on page two of the Feb 14 minutes were based upon a chart in the March 15, 2000 Surface and Ground Water Historical Data report. This chart shows that Hexavelant chromium was found in the stream sediment samples. Mr. Patterson stated that the Corps of Engineers is putting together more data on that matter for a presentation to the RAB at a future date. Lt. Col. Tadsen made the motion to accept the minutes as amended, so moved by Mr. Smith, seconded by Mr. Landor. The motion was passed and carried.

**2. Methods for Biological Field-Truthing of Plants, Animals, and Soils at Winklepeck Burning Ground by Dr. Barney Cornaby of Science Application International Company**

Lt. Col. Tadsen introduced Dr. Cornaby to the board. He is a returning speaker having spoken of this process before at a previous RAB. Dr. Cornaby stated that the discussion on this topic needed to be broken down into two parts: methods and results. He stated that methods were ways of finding out something. They were procedures. He stated that basically this study looked at organisms, what they are eating and what is the harm that may occur from this intake. Mathematical predictions suggest that there is a chance of harm or risk in the Winklepeck Burning Grounds. The predictions are such but the reality seems normal. Yet, if we start looking carefully we see that there are some areas that are disturbed. As we observe the actual areas we can begin to reconcile or nail down what is truly the reality of the disturbance. Clean up goals must be set up. These include the cleaning up of chemicals that might harm biological organisms. Dr. Cornaby stated that while he realized that people and family members were most important to the RAB this study concentrated on the non-human.

The Winklepeck Burning Grounds encompasses approximately 200 acres. It is located in the middle of RVAAP. There are 70 burning pads located there about the size of the meeting room at Paris Township (45 feet x 60 feet). Historically, materials have been taken to these pads and detonated. It is the residuals from this process that is of concern to us. These residuals include such chemicals as cadmium, lead, explosives, and other chemicals that are dangerous to us, plants, and animals.

Dr. Cornaby stated that the purpose of his presentation was to re-announce the technical problem, precisely what is going on environmentally at the RVAAP. Dr. Cornaby stated that he wanted to champion the idea of biological field-truthing to solve the problem of what is going on. He stated that the burden of the evening's message was to explain the methods of testing and observation that were performed. The results of this study are still being understood.

The EPA has 8 steps that it utilizes when screening for ecological risk assessments. The first three steps have been applied in this study. The Army has decided not to pursue all of the steps in the normal sequence. By eliminating some of them we get right to the heart of the matter. Instead of looking at laboratory animals we looked at wild ones in the field. Instead of looking for single chemicals we were looking for mixtures of chemicals. Instead of looking at biological subjects for a short duration of time we were able to examine lifetime or multiple generations. We were able to take into account acclimation or adaptation on the part of the organisms instead of looking at an organism with no adjustment.

Dr. Cornaby showed a map that pointed out the locations of predicted harm. There are 7 sites at Winklepeck that require deeper investigation. These are areas where the ecological risk is expressed as a hazard quotient (HQ) is higher or greater than 1000. At this point Ms. Marti Long asked that Dr. Cornaby define HQ. He replied that it was the hazard quotient. This is the ratio of the exposure or concentration of the soil to the concentration of contaminants in the organism that can cause a biological effect. This is the number one trigger for investigating a site further. Lt. Col. Tadsen then asked Dr. Cornaby why did he select the animals that he did for the study. Dr. Cornaby replied that he would cover that more in depth later on.

Dr. Cornaby told the RAB that the Ohio Army National Guard has completed field studies on plants and animals that show that Ravenna has functioning ecosystems, e.g. soil, plants, and animals. Yet, there is evidence of some imbalances, e.g. patches of no and low vegetation. These are direct indicators of harm. Screening risk assessment predicts harm in certain places for certain organisms. He explained that biological field-truthing studies are cheaper than cleaning up and biological studies usually show fewer areas that need clean up. The best way, both in regards to efficiency and financial attractiveness or conduct, is to measure field-truthing. Usually when these studies are conducted the number of areas of concern is lowered and the clean up standards are made higher.

Protection of the environment in terms of animals and plants requires a lot of knowledge to be performed successfully. While there are mathematical formulas available they are limited in their ability to represent reality. Actual "real-life" measurements are much better and less costly than actual remediation. Actual plant and animal measurements co-located (or co-habiting) in the soil where contamination occurs provide more concrete data from which to formulate good cleanup goals. The fact is that biological ground-truthing usually results in higher cleanup goals and less areas to be cleaned up, as stated earlier.

Dr. Cornaby explained to the board that the main function of biological ground-truthing was to examine various parts of the picture until the whole view becomes apparent. Biological field-truthing makes comparisons between "clean" and "dirty" places. It measures plants and animals, the specifics about them and about the soil. When making the comparison between "clean" and "dirty" areas, they test the plants, animals and the soils. The degree of significant difference that has been agreed upon thus far is 20%. If the area at the reference point is at 100% the site at the burning pad can be at 80%.

Reference sites or "clean" sites are chosen based upon their comparability to the burning pads. They are similar in most aspects only there are no chemicals present. They are similar in terms of soil type, slope and hydrology, disturbance

type (i.e. physical, burning), and the disturbance duration. A thorough search inside of the RVAAP was conducted to locate these sites. The reference locations chosen match three sets of pads. These are as follows:

- ⊖ Burning pads 37 and 38 with reference sites E1 and E2.

The common features: Slag, recent disturbance, flat, used to store materials, created in 1980 and last used in 1992. The reference site is an old field hospital site; graded and covered with slag it is adjacent to Bldg. A-9, Portage Army Depot.

- ⊖ Burning pads 58 and 59 with reference sites S1 and S2

The common features: Little or no surface slag, flat and wet, bermed, shrubs and small trees adjacent, created in 1941 and last used in 1973. The reference site is a borrow pit off South Service Road near Load Line 4.

- ⊖ Burning pads 66 and 67 with reference sites J1 and J2

The common features: No surface slag or unexploded ordnance (UXO) flat, herbaceous, created in 1941 and last used no later than 1980. The reference site is an unpaved old airstrip south of the NACA test site.

Dr. Cornaby included a map with the reference sites location annotated as well as that of the Winklepeck Burning Grounds. Next he passed out a packet of pictures of the burning pads and their reference sites for the RAB members to view. He stated that one pad was particularly contaminated with pink water sitting on the surface. An audience member stated that he too had red water in his creek. What did this mean? Dr. Cornaby replied that the pink in the water on the burning pad is due to residual explosives, the red in the creek is more than likely due to high iron content in the water. This is not uncommon in this area. Mr. Patterson also explained that the pink water at the burning pad was explosives. Another audience member asked where the team came up with the figure 20% being the rate of significant difference. Dr. Cornaby replied that it is difficult to measure things in nature closer than that and that 20% is a common figure when comparing healthy and sick populations.

Dr. Cornaby told the RAB that at each site 30 measurements need to be taken. If they conducted fewer than 30 measurements the results would suffer. Soil is measured less often due to the emphasis being on the biological not the soil. Correlation and regression analyses to follow.

Dr. Cornaby stated that he could have measured larger animals, but their roaming range is larger and there are fewer of them. Soil invertebrates, like earthworms, could have been measured, but they have little appeal to us. Small mammals have the best exposure to soil compared to hawks and earthworms and they integrate through movement. Vegetation was tested because it is the base of the food web and it has exposure to the soil and is immobile.

There are 15 to 20 different ways to measure vegetation. Four ways were eventually chosen as being the best ways. They measured the percent of cover, the number of different plant species, the number of individual plants and the weight of above ground plants. Dr. Cornaby showed a one meter by one meter square sampling grid that was used in taking these measurements.

There are 15 or so different ways to measure small animals. Mammals were tested for their reproductive potential because certain chemicals interrupt reproductive patterns. They also counted the number of individuals that were found and the number of different species. Dr. Cornaby included a diagram that

showed where the traps were located around the burn pads. He also showed the RAB and audience members a Sherman Live Trap and demonstrated how it worked.

Soil samples were taken in areas where the plants were measured. The measurements used to test the soils were concentration or the amount of contamination in the soil to which plants and animals could be exposed. At this point Dr. Cornaby and Lt. Col. Tadsen brought to the RAB's attention that the Ohio EPA was actively involved in all aspects of the testing process. This is a cooperative effort between all agencies involved with RVAAP.

Dr. Cornaby made the following comments in summary; The environment means a lot of things and for this discussion it means the biological resources such as plants and animals that live on/in the soil, drink the water, breathe the air, and eat the food that surrounds them. The RVAAP team is working together to answer important questions about the biological resources at Winklepeck Burning Grounds (and nearby areas of concern). The EPA procedures and also the Army's procedures for screening ecological risk assessment have merit and meaning, and these mathematical methods predict harm or risk at numerous places at Winklepeck, especially at 7 of the 70 burning pads. Yet, the plants and animals appear to be "healthy" even though there are small places where few plants grow. The mathematical methods are conservative and have limitations. It is less costly to intelligently design and perform a biological ground-truthing study than to proceed with clean up. Thus, the Army has asked that a systematic search be made to find out the best way to do this. The comparison approach works by measuring the vegetation and mammals as well as the soil on/near the "dirty" burning pads and on "clean" or reference sites at Ravenna. We have done a thorough search for reference sites similar to the burning pad sites except for absence of contaminants. Comparability is secured by having same/similar soil type, slope and hydrology, disturbance type, and disturbance duration. We are using time-proven biological methods, such as weights, the number of individuals, the number of species, and the reproductive success to make these comparisons of plants and animals. Over the next few months we will continue to sift, organize, categorize, discuss and understand the results of the biological ground-truthing. Then, decisions can be made about what to do or what not to do about environmental protection. Environmental protection is the intent of completing the biological field-truthing about plants and animals. It is vital that we find out at what cost this is relative to human health.

Dr. Cornaby then thanked the board for their interest and attention and invited more questions.

Dr. Andreas asked what is keeping the reference sites in an old field condition. Dr. Cornaby replied that brush mowing is probably responsible for the areas remaining in that state. Ms. Long asked whether these studies are being conducted at similar installations. He replied in the negative. He stated that laboratory studies were being conducted but not field-truthing at this extent. This combination of techniques is new. Mr. Floyd Banks asked if time had an impact on the degradation of the pollutants and if that had been taken into consideration. Dr. Cornaby replied yes to these questions. The pads were used a long time ago. Animals studied were taken from those areas. These animals, due to their relatively short life spans, are multi-generational giving us insight into any long term effects. Mr. Abercrombie asked if there were any species found at the reference site that were not at the burning pads. Dr. Cornaby answered that

chipmunks had been found and he believes that to be due to the large number of nut trees located in the vicinity of the reference site, whereas there are none to be found by the burning pads. Mr. Gourley asked if the small mammals' short life span had been taken into consideration. Dr. Cornaby replied that if there were any problems we would have seen the effects of this by now because of the many generations of organisms. An audience member asked if other tests had been performed on the mammals besides sperm. Dr. Cornaby replied that more measurements were taken. For example, they weighted the mammals' liver and other organs as well as did a cursory examination for lymphomas. None was found.

Dr. Cornaby closed at 7:40 p.m. Mr. Patterson announced to the board that all of these documents that have been discussed are available at the local repositories. He stated that Dr. Cornaby's and SAIC's work was a vital part of the study of Winklepeck Burning Grounds.

**3. Operations Support Command (OSC)/Program Manager - Mr. Bob Whelove**

Mr. Patterson introduced Mr. Bob Whelove, Jr. of OSC. Mr. Whelove commented on how pleased he was with the RVAAP and the RAB. He stated that the RAB is working better here at Ravenna than at any of the other installations in OSC. He talked about the process of risk assessments and developing risk equations. He stated that you look at the installation, see where people have been, sample the area and then develop a risk equation. If a risk is detected you figure out a feasible way to clean the area and then you design the clean up. After the area has been cleaned it goes into the long term monitoring stage to ensure that everyone is protected. The first partnering meeting between OSC and Ohio EPA and Ohio Army National Guard was in May 1995. After about a year it was realized that all of the parties share common goals. RVAAP is about 1/3 of the way through the cleanup efforts planned for it. Due to intense partnering RVAAP has never had to repeat a phase. One clean up project has already been completed and the installation is getting ready to embark on two more cleanup projects soon. These are the two landfills, one the Paris Windham dump site and the other the Sand Creek dump site. Some of the heavy clean up will take place over the next 6 years. He stated that Mr. Patterson with assistance from the Army Corps of Engineers had been instrumental in constructing the long-term planning of the cleanup. Presently the budget is set for \$5 to \$7 million dollars a year for clean up for the next 6 years. These figures represent significantly more than the installation was initially being given. It was first thought that the effort would continue until 2023 but now it looks as if it might be finished by 2012.

An audience member asked Mr. Whelove if there was still ammunitions being stored at the facility. Mr. Whelove answered that there were 750 storage units but 250 of them stand empty. There are plans to store the remaining munitions for the near term. Most of the original rail system used to transport the cargo has since been removed. In order to remove the remaining munitions they would have to be shipped via truck. This would be costly. A member asked if after the cleanup of the installation, would Route 225 be open for public access. Lt. Col. Tadsen answered that, more than likely the road will remain closed. The cost to open the road would be excessive when you consider the gates and fencing that would have to be installed and maintained. Mr. Whelove asked if there were any additional questions, as there were none, he thanked the board once again for their participation in the RVAAP and closed.

**4. TAPP Provider/URS**

Mr. Patterson stated that a representative from the RAB's TAPP provider was present and that they would help the RAB look at the document referred to by Dr. Cornaby and assist them in formulating some ideas, comments and questions. At this point he introduced Ms. Joanne Barch of URS. Ms. Barch stated that URS had indeed received the report that Dr. Cornaby was referring to. She stated that they (URS) had attended a meeting with Army representatives on May 8<sup>th</sup>, 2001. They also took a trip out to the Winklepeck Burning Grounds to look at the burn pits and to see all of the reference sites. She and her colleagues will eventually have a prepared comment report for the Army. All of their findings will first be presented to the RAB. She stated that URS was working on the project now and would return to the next RAB meeting in September to discuss their findings. There being no questions, Ms. Barch closed.

**5. Additional Business**

Ms. Rachael Craig asked what was the other meeting that was being held in September besides the next RAB meeting. Mr. Patterson informed her that was the Installation Action Plan (IAP) workshop. The IAP takes a look at scheduling and budgeting issues. All members of the RAB are invited to provide input. He stated that as it draws closer notices would be sent out. He mentioned that the documents regarding RVAAP are coming available on CD. He stated that anyone interested in obtaining copy so that they might review the documents were more than welcome to request a copy. He stated that some documents are available on CD now for viewing at the Newton Falls Library. Secretary Gilliam announced that the Ravenna repository had expressed interest in developing a system to utilize CDs. Ms. Craig asked if the subject of chromium at the arsenal would be a topic for the next RAB meeting. Mr. Patterson agreed. Ms. Long asked if they should allot time for discussion on the potential of conducting health surveys. She asked the board in what direction did they want to pursue that avenue. Ms. Craig stated that she was in favor of a local health study. She brought it the board's attention that TAPP funds could not be used to generate additional data. Mr. Patterson stated that they could use the funds to delve further into existing data. He suggested that they have Dr. Rupp return to the RAB for a more complete discussion. It was decided that Dr. Rupp would be invited back for the November meeting.

**6. Scheduling the Next Meeting**

The next meeting was scheduled for September 19, 2001. Mr. Gourley and Mr. Smith both offered to host the meeting. It was decided that Windham would hold the meeting. The next meeting then will be at the Windham Town Hall, Windham, Ohio at 6:00 p.m. There being no further business Lt. Col. Tadsen adjourned the meeting at 8:22 p.m.

Respectfully Submitted,

Denise L. Gilliam  
Secretary, RAB

DG/dg

