

**Ravenna Army Ammunition Plant
Restoration Advisory Board (RAB)
Meeting Minutes
November 14, 2001**

1. Call to Order and Reading of the Minutes

The meeting was called to order by Lt. Col. Tom Tadsen at the Windham Town Hall, Paris, Ohio at 6:10 p.m. Secretary Denise Gilliam took attendance with 16 present, 6 excused and 2 absent (Mr. Edward Boles and Mr. Milan Markov). Lt. Col. Tadsen made the motion to suspend with the reading of the minutes, so moved by Mr. Walter Landor and seconded by Ms. Nina Miller. There were no changes to the minutes.

2. Presentation on RVAAP Chromium Data and Information

Lt. Col. Tadsen introduced Mr. Paul Zorko and Dr. David Brancato of the U.S. Army Corps of Engineers, Louisville District. Mr. Zorko began the presentation by passing out, to the members, a spread sheet entitled Summary of Chromium Analytical Results for RVAAP. The handout shows various areas of concern (AOCs), on the arsenal, that had been tested for the presence of Chromium. He stated that a memo dated 1950 was found that details various testing performed with the Chromium +6 (Cr+6). Mr. Zorko stated that before the Chromium was disposed of it was first diluted with water until it reached EPA standards for release and was then deposited at the C-Block Quarry. He said that dye was added to the Cr+6 to track its movements through the groundwater system. On and off-site wells were tested and found to be free of contamination. Chromic acids were used at Load Lines 2 and 12. It was initially used at Load Line 2 then it was transferred to Load Line 12. Chromium issues have been looked at more closely due to the interest it has generated from the public. Remedial investigations that were performed on Load Lines 2, 3, and 4 included testing for Chromium. The information is still coming in and the data is being validated. From the Load Line 12 data we see that chromium here would have been released into Cobbs Pond and then traveled on to Sand Creek. A large detection of 327 ppm (total chromium) was found at Load Line 12. The preliminary testing was done in the C-block Quarry seeing as historically this was a disposal site. Healthy detections of Chromium have been present at this location. The detections were found in the surface soil, so initial thoughts regarding the site as a disposal area are confirmed. Other than these two locations there is not wide spread pervasive contamination that is leaving the site. When the data from Load Line 2 has been validated there be more information. Mr. Zorko expressed hope that the C-Block quarry will be remediated at some point in the up coming year.

At this point Dr. Brancato took the floor. Dr. Brancato stated that he would be discussing Chromium and it's health effects. He said that the movie Erin Brokovitch raised a lot of fears with regards to the negative impact on human health from Cr+6. Dr. Brancato stated that people think Chromium and

automatically think of cancer. He stated that Cr+6 is indeed a carcinogen, but there is no release of the chemical that could cause harm to individuals residing around the arsenal.

Dr. Brancato stated that Chromium is an element, it is an atom. Chromium likes to exist in the +3 valance state. And whereas Cr+6 is dangerous to health, its counterpart trivalent chromium is good for humans. It aids the body in processing insulin. Broncogenic carcinoma is caused by the inhalation of Cr+6. Inhalation is the major pathway for Cr+6. The Doctor stated that Cr+6 causes genetic damage.

Trivalent chromium occurs naturally in the environment. It is an essential nutrient used to promote the action of insulin in the body so sugars, proteins, and fats can be utilized for energy. Cr+6, on the other hand, is produced by industry and is used as a rust and corrosion inhibitor. When it is used in these industries it can and is released into the environment. Many think that when Cr+6 enters the environment it immediately gets into our systems, however when it reaches the environment there are naturally occurring substances in the water and soil that prohibit it from being mobile. Chemicals such as sulfur and barium bind it so that its mobility is severely restricted. For example, when Cr+6 is released into soil that is rich in iron it reverts back to its harmless form of trivalent chromium. He stated, however, that the only confirmed cancer resulting from exposure with Cr+6 is lung cancer and only after long-term exposure.

When ingested Cr+6 is absorbed better than trivalent chromium, and leaves the body via feces. A small amount will pass through the intestines and enter the blood stream. The most damaging contact or absorption of Cr+6 is through inhalation. When it gets into the upper lung many particles are coughed up or swallowed. When it reaches the lower lung, it passes through the lining of the lungs and gets into the blood being filtered by the kidneys. It can only be absorbed through the skin if the skin is broken. Exposure to Cr+6 can be rather obvious as it causes severe irritation of the nose and holes in the nasal septum.

Dr. Brancato showed a slide depicting a strand of DNA. He explained that the "rails" of the DNA are primarily composed of sugar. 4 molecules hold the steps in place, these are called "bases". Mutagens, such as Cr+6, effect these steps. However simply because you have been exposed does not mean that you will contract cancer. The body produces enzymes to help fight the damage caused by exposures. Events that lead up to contracting cancer are numerous. Dr. Brancato asked the RAB to please recognize, from a proactive standpoint, that individuals have background occurrences of cancers. These backgrounds are triggered by variations in lifestyle, heredity, and exposure. When these triggers are looked at only 18% relates to exposure from the environment. If people learn to correct diet and lifestyle they can circumvent the background occurrences.

Dr. Brancato stated that the RVAAP's release of spent acid to the ditch ended the fall of 1949. He reminded the RAB that release doesn't always lead to exposure.

He also reminded them that the Cr+6 that was released was diluted to achieve a concentration level of .05ppm. He stated that 500 ppm of Cr+6 requires a dilution factor of 10,000. So this means that large amounts of water was needed to meet these standards. He stated that the standards were very good considering the time frame. Dr. Brancato stated that he doesn't believe that the amount of Cr+6 released was enough to cause physical changes to employees or individuals living off-site in the surrounding areas. He stated that Cr+6 is noticeable when you are exposed to it. As he stated earlier it burns your nostrils to such a degree that you would know something was amiss and leave the area. Drinking water standards are on a slide. There can be an exposure without having a negative effect. Industries that manufacture rubber, cement, and batteries release Cr+6, but OSHA regulates those levels and sets the standards. NIOSH wants OSHA standards to be lowered. RVAAP had a release but Dr. Brancato stated that he doesn't feel that if the substance escaped, there is enough to harm anyone. He stated that more data is being collected and reviewed but the findings so far lead him to believe in the sample results that have already been taken.

Lt. Col. Tom Tadsen asked Ms. Eileen Mohr to explain some of the sampling methods that were utilized. Ms. Mohr explained to the board that they took split samples for sediment, ground water, and soil. The samples were then sent to a different lab than the subcontractor's. That information is in the process of being validated. The numbers aren't back as of yet, but there appears to be little to no known detections. Lt. Col. Tadsen told the board that there are a number of contingency samples taken to provide very good solid data. Ms. Marti Long asked if they had any idea of the distribution of the contaminant. Mr. Zorko stated that currently we know about the C-Block Quarry and a little was found in a drainage ditch on Load Line 12. Other Chromium was found but it is probably not related to the release but from other sources such as paint, etc. Mr. Mark Patterson added that if you look at the spreadsheet presented by Mr. Zorko you will see that a lot of the detections are for the benign Trivalent chromium as well. Dr. Brancato added that if you had a tool to measure chromium, you still would not be able to determine how long an individual had been exposed. Mr. Daugherty stated that if there is enough metal in the soil to take the punch out of the Chromium, it is, in essence, rusting. If you have iron in the ground you are creating rust by reverting the Cr+6 to Trivalent chromium. However the brass and the other metals in the soil do not rust. All of this is at C-Block Quarry. Mr. Patterson replied that the liquid form of the substance was dumped there. Mr. Daugherty asked for clarification that Cr+6 had actually been found at the site. Mr. Zorko confirmed that it had. He added that they only recently decided to look for Cr+6 and that was due to the public interest in it. Mr. Patterson stated that the locations that were selected for sampling were selected based upon information found in historical records. Mr. Daugherty asked when did they stop dumping. Mr. Zorko stated that the operations ceased in 1954. Mr. Daugherty asked, so basically it has been almost 50 years and it is still out there? Mr. Zorko confirmed that yes it was still there. Dr. Brancato added that fact alone is proof that it doesn't move. Ms. Miller asked how the Cr+6 could be gotten rid of. Mr.

John Jent, of the U.S. Army Corps of Engineers, interjected that under the interim removal of the site the contaminated soil will be removed. Mr. Daugherty asked if Cr+6 was all around us. Dr. Brancato replied in the affirmative, stating yes, it was even in copier toner. Ms. Miller stated that according to the spreadsheet it doesn't look as if water was tested. Mr. Zorko replied that it wasn't on the list to be tested because there is no real water source at C Block Quarry. They went in search of surface water, and unable to find any, looked to see if it had infiltrated the soil, that is why we are concentrating on that area. Mr. Patterson stated that initially the C-Block Quarry rated a medium rating, so the larger sites that rated high have been worked on first. He stated that the Army was now going to use this data that has been obtained and take some additional sampling and then get that dirt out of there and follow up with some confirmation studies. He stressed that there was groundwater monitoring included in the plan. The quarry does not have any water in it, which is surprising. It is the driest of the quarries and does not include a wetland, which is also surprising. Lt. Col. Tadsen stated that is probably due to the fact that the quarry is situated on high ground. Ms. Marti Long asked whether or not composting techniques could be used to treat the contaminated soil. Mr. Zorko replied that there are some new cutting-edge technologies coming out in that direction. Ms. Mohr stated that MKM Engineers, Inc. had done a bioremediation project utilizing composting methods. She stated that the soil was tested before and after the amendments and as far as metals were concerned there were no real changes. Mr. Richard Callahan (MKM) added that composting would only be useful for speeding up the natural transformation of Cr+6 to Trivalent chromium. Ms. Long asked if the contaminated soil would be considered hazardous waste. Mr. Patterson answered that TCLP testing would have to be done. He stated that simply because Cr+6 is present doesn't necessarily categorize it as a hazardous material. An audience member asked about the ammo boxes that have been chipped up and whether or not they were tested. Mr. Patterson answered that several thousand boxes were destroyed but there was no evidence of contamination in them. An audience member asked Dr. Brancato about the standard deviation he referred to and suggested that it was rather skewed. Dr. Brancato stated that there is a range around the mean that is a little higher than you would like to have, but that is consequent to any bias sampling effort. He stated that the upper confidence limit does balance out the equation. Mr. Jent told the board that when the Ramsdell Quarry was dry that they looked at the area again and took more sediment samples. Non-detects for Cr+6 was a good sign. He stated that from that finding we can assume that the liquid acid form of Cr+6 was taken to C-Block Quarry and not just dumped all over the plant. Lt. Col. Tadsen asked Ms. Mohr her opinion on the fact that ferrous content in moist soil can return Cr+6 to its trivalent chromium state. Ms. Mohr stated that a higher moisture content could be helpful. She stated that they should look at Chromium found in background locations seeing as it is naturally occurring. Lt. Col. Tadsen stated that every year there is a review of the Portage County Conservation Society. They look at iron in the soil. A lot of the wetlands in the area might help to expedite the process of turning Cr+6 back to trivalent chromium. Mr. Floyd Banks asked for confirmation that the Cr+6 was fairly

inert. It doesn't seem to migrate easily. Dr. Brancato concurred. He stated that Chromium combines into insoluble salts and stay as these salts. An audience member asked if these substances would be flying through the air when the excavation of the site commences. Dr. Brancato stated that the vegetation prevents that and the facility has procedures in place to manage dust. Perimeter monitoring of the site would be conducted according to OSHA and EPA standards. Another audience member asked what would happen if a tornado hit the area. Dr. Brancato stated that he doesn't think that dispersion patterns would uplift the material and transport them. At this point Mr. Zorko brought the board's attention to the handout and on page 3 the rate should read 17.4 instead of 27.4. Lt. Col. Tadsen asked what is ferrochrome and how is it relative to both forms of Chromium. Specifically the DLA stockpiles. Dr. Brancato stated that Chromium and Iron and the like are part of the hydroxyl group. Other than that he has no additional information regarding the DLA stockpiles. Mr. Patterson stated that there is some ferrochrome that sits on concrete slabs, it is not Cr+6 and is probably more metallic chrome than anything else. He stated that testing has been performed by the DLA and they confirm that there is no sign of leaching at the site.

The U.S. Army Corps of Engineers concluded their presentation at 7:37 p.m. Lt. Col. Tadsen thanked the speakers.

3. Additional Business

Ms. Nina Miller informed the board that there was still the issue of voting on new members, however there were not enough board members in attendance for a quorum. It was decided that the vote would be taken at the next meeting. All members were invited to tell people about possible openings on the board as well. January 16, 2002 was named as the date for the next RAB meeting. It will be held at the Paris Town Hall. There being no further business Lt. Col. Tadsen adjourned the meeting at 7:38 p.m..

Please Note: The date of the next RAB meeting has been changed from 1/16/02 to 3/20/02.

Respectfully Submitted,

HOPE YOUR HOLIDAYS WERE WONDERFUL!

Denise L. Gilliam
Secretary, RAB

DG/dg