

# MINUTES

**INSTALLATION RESTORATION PROGRAM  
RESTORATION ADVISORY BOARD MEETING  
ABERDEEN PROVING GROUND, MARYLAND**

**THURSDAY, 26 FEBRUARY 2004**

**7:00 p.m. – 9:35 p.m.**

**EDGEWOOD SENIOR CENTER**

**RESTORATION ADVISORY BOARD MEMBERS PRESENT AT THIS MEETING:**

Mr. Kevin Barnaba  
Ms. Glenda Bowling  
Mr. Arlen Crabb  
Mr. Roy Dietz  
Mr. Butch Dye (Maryland  
Department of the Environment)

Mr. Doug Richmond (Harford County  
Emergency Operations Center)  
Mr. Ken Stachiw (Army Co-Chair)  
Mr. Frank Vavra (U.S. Environmental  
Protection Agency)  
Ms. Ruth Ann Young  
Mr. Thomas G. McWilliams

**RESTORATION ADVISORY BOARD MEMBERS NOT PRESENT AT THIS MEETING:**

Ms. Mandi Elliott-Bird  
Ms. Christine Grochowski (Community  
Co-Chair)  
Mr. Ted Henry

Mr. Greg Kappler  
Mr. Dan Pazdersky  
Mr. Dennis Warwick

**ENCLOSURES TO THESE MINUTES:**

- 1: Roster of Meeting Attendees
- 2: Agenda
- 3: March 2004 Calendar of Events
- 4: Canal Creek Study Area Presentation Materials

## **I. EXECUTIVE SUMMARY**

### **Administrative Comments**

Mr. Ken Stachiw (Chief, Directorate of Safety, Health and Environment (DSHE) Environmental Conservation and Restoration Division (ECRD)) reported a meeting may be scheduled to discuss outstanding issues with regard to Operations Security (OPSEC) procedures. Mr. Stachiw stated that Mr. Ted Henry (RAB Member) expressed interest in being involved in the annual IRP workshop. The workshop is conducted to establish cost estimates for all sites within the IRP cleanup programs. Mr. Stachiw stated that Ms. Katrina Harris (General Physics Corporation) will poll RAB members to determine who would be interested in attending the workshop.

### **Perchlorate Detections Update**

Mr. Ken Stachiw (Chief, Directorate of Safety, Health and Environment (DSHE) Environmental Conservation and Restoration Division (ECRD)) reported that a request was denied to use environmental cleanup monies to fund the removal of soils contaminated with perchlorate. An effort is being made to possibly obtain research and development funds to complete a research project for perchlorate. Mr. Stachiw displayed slides depicting results from the latest round of perchlorate sampling. The perchlorate detections reported from the City of Aberdeen 3 February 2004 sampling event ranged from non-detect to 2.4 parts per billion (ppb). A result of 0.34 J ppb was reported for the finished water. The 17 February 2004 results ranged from non-detect to 1.5 ppb. The finished water had perchlorate detections of non-detect for 17 February 2004, and 0.44 J ppb for the 24 February 2004 sampling event.

### **Performance-Based Contracts**

Mr. Stachiw provided the RAB members with sample language from a Performance-Based Contract (PBC) that was developed for the Aberdeen Area of APG. A lengthy question and answer discussion was held with Mr. Stachiw, Mr. Randy Cerar (Army Environmental Center (AEC)), RAB Members and other meeting attendees regarding the possible implementation of PBCs at APG. Full documentation of the discussion will be provided in the 26 February 2004 RAB Meeting Minutes.

### **Canal Creek Study Area**

Mr. John Wrobel (DSHE ECRD Project Officer) provided an update on the Canal Creek Study Area. He provided updates on the East Branch Canal Creek Study Area, the West Branch Canal Creek Study Area, and the Canal Creek Study Area Operable Units.

#### **East Branch Canal Creek Study Area**

The Groundwater Treatment Plant (GWTP) for the East Branch of Canal Creek has been operating since April 2003. Currently the plant has been shut down since 6 February 2004 to allow for the replacement of the gearbox associated with the lime mixer, and the replacement of the Amborsorb vessels. Approximately 70 million gallons of groundwater has been treated, with all effluent meeting NPDES equivalency permit requirements. The capture zone of the plume has been developed in accordance with the Record of Decision (ROD) requirements. A number of process changes were completed including the lime reaction tank mixer, methane detections, alum addition, sludge recirculation, lime addition, and replacement of the Amborsorb vessels.

#### **West Branch Canal Creek Study Area**

Current activities are being focused on the upland delineation of the groundwater plume and the wetland investigation and pilot study. Both the upland and wetland investigations will lead to the Remedial Investigation/Feasibility Study (RI/FS), Proposed Plan (PP), and ROD.

The upland groundwater plume contains multiple source areas of chlorinated volatile organic compounds (VOCs) resulting from historical site activities. The site geology is comprised of unconsolidated sediments defining a surficial aquifer, upper confining unit, and the Canal Creek aquifer. The site hydrogeology shows that the VOC plumes are flowing west toward the wetlands. The scope of the RI for the upland site involves Cone Penetrometer Testing/Direct Push Technology (CPT/DPT) hotspot plume delineation, surface media sampling for Building E5188, monitoring well installation, groundwater sampling, well assessment and abandonment, updated plume delineation assessment, and natural processes assessment.

A shallow groundwater seep investigation was completed using Thermal Infrared (TIR) technology. The seep locations were initially identified during the winter 2002. Another TIR flight was completed in 2003, and the 2004 flight took place on 26 February 2004. The shallow groundwater was sampled using passive diffusion samplers, along with corresponding surface water samples. All samples were analyzed for VOCs and methane. The 2003 VOC detections were similar to previous sampling results.

A number of tests and studies are being completed in the West Branch of Canal Creek in an attempt to determine a technology that closely mimics the natural processes currently degrading target compounds in the wetland areas. Studies include bacterial consortium testing, development of biomats, column testing, and an enhanced bioremediation study.

Planned Fiscal Year 2004 (FY04) activities for the West Branch Canal Creek Study Area include: phased approach to pilot test technologies, geotechnical characterization, field readiness testing, monitoring system design and installation, and direct injection and reactive biomat pilot-test installation and monitoring.

#### Canal Creek Study Area Operable Units

An investigation is being completed in the Canal Creek Study Area to identify potential sources of contamination and to develop remedial alternatives for the identified sources. Planned activities include media sampling, surveys, reporting, and treatability studies as needed. The schedule includes: Draft Work Plan for review by the Project Team in March 2004; surveys and media sampling conducted from June through September 2004; and submittal of the Draft RI in December 2004.

A final RI was issued in January 2004 for three sites including: Salvage Yard, DM Filling Plant, and the World War II (WWII) Railroad Yard. The Feasibility Study is currently being prepared. Based on RI conclusions, the FS alternatives under consideration for the soil in the Salvage Yard include: no action, institutional controls, low permeability cover, Resource Conservation and Recovery Act (RCRA) cap, and excavation and off-site disposal. Alternatives under consideration for the Burn Residue Disposal Area include: no action, improve and extend existing cover, and excavation and off-site disposal. Alternatives being considered for DM Filling Plant surface soil include no action, excavation and off-site disposal, and phytoremediation. Alternatives for the WWII Railroad Yard soil and sediment include no action, and excavation and off-site disposal. The schedule for the three sites involves completion of the FS in Spring 2004, completion of the Proposed Plan in Summer 2004, Draft ROD completion in Fall 2004, and Remedial Action completion in 2005.

## **II. OPENING REMARKS AND ADMINISTRATIVE COMMENTS**

The December 2003 U.S. Army Garrison Aberdeen Proving Ground (APG) Installation Restoration Program (IRP) Restoration Advisory Board (RAB) meeting was called to order by Mr. Kenneth Stachiw (Chief, Directorate of Safety, Health and Environment (DSHE) Environmental Conservation and Restoration Division (ECD); Army Co-Chair) at 7:00 p.m. on Thursday, 26 February 2004. The meeting took place at the Edgewood Senior Center located at 1000 Gateway Road in Edgewood, Maryland.

Enclosure 1 to these minutes is a meeting attendance list. RAB Members in attendance received an agenda (Enclosure 2), a RAB calendar of events for March 2004 (Enclosure 3), and a copy of the Canal Creek Study Area presentation (Enclosure 4).

Mr. Stachiw reported that, due to a delay in reviewing the document, the Minutes from the 29 January 2004 RAB meeting have been included in the RAB Member packets for the March 2004 meeting. Mr. Stachiw encouraged the RAB members to review the minutes and let him know of any comments.

Ms. Ruth Ann Young (RAB Community Co-Chair) welcomed and introduced Mr. Fred Silva from Senator Hooper's office, Ms. Bridget Smith from Senator Paul Sarbane's office, Ms. Margaret Scruggs from Representative Dutch Ruppersberger's office, and Mr. Bob Mills from Delegate Chuck Boutin's office.

Mr. Stachiw stated that a copy of the agreement reached between Operations Security (OPSEC) Division, the Army and the Aberdeen Proving Ground Superfund Citizens Coalition (APGSCC) should have been distributed to the RAB Members. Ms. Glenda Bowling (APGSCC, RAB Member) stated that a copy of the agreement was e-mailed to all RAB Members. Mr. Tom McWilliams (RAB Member) stated that he did not receive a copy of the agreement. Mr. Arlen Crabb (RAB Member) agreed to fax a copy of the agreement to Mr. McWilliams.

Mr. Stachiw stated that no presentation would be given regarding the OPSEC agreement. Mr. Stachiw encouraged all RAB members to review the document. If necessary, a time will be scheduled during a future RAB meeting to discuss any comments or concerns regarding the agreement. Mr. Stachiw added that a meeting might be scheduled to further discuss the 3-Tiered Approach for OPSEC issues designed by Mr. Ted Henry (RAB Member). There is some question as to whether APG's agreement to the approach was formal or not. Mr. Stachiw stated that he would further investigate the issue. RAB Members should email any further concerns with regard to the OPSEC issue to Mr. Stachiw.

After confirming RAB Members had no further comments, Mr. Stachiw provided an update on the perchlorate detections in the Aberdeen Area of APG.

### **III. PERCHLORATE DETECTIONS UPDATE**

Mr. Stachiw displayed slides depicting results from the latest round of perchlorate sampling. The perchlorate detections reported from the City of Aberdeen 3 February 2004 sampling event ranged from non-detect to 2.4 parts per billion (ppb). A result of 0.34 J ppb was reported for the finished water. The 17 February 2004 results ranged from non-detect to 1.5 ppb. The finished water had perchlorate detections of non-detect for 17 February 2004, and 0.44 J ppb for the 24 February 2004 sampling event.

Mr. Stachiw reported that a request was submitted to obtain funds for the removal of contaminated soil in the Aberdeen Area. Guidance was received denying the use of environmental funds for the removal of

soils contaminated with perchlorate. An effort is being made to possibly obtain research and development funds to complete a research project for perchlorate.

Ms. Bowling asked if the monies would be used for the removal of soil. Mr. Stachiw confirmed that the proposed project would involve the removal of soils. Ms. Young asked for the location of the proposed removal. Mr. Stachiw stated that the soil removal would take place in the Aberdeen Area at locations where drums related to perchlorate concentration were previously removed.

Mr. Crabb questioned why the request for environmental funds was denied. Mr. Stachiw stated that he would have to refer to the memo for the exact reasoning behind the denial. A copy of the response will be forwarded to Mr. Crabb. The initial reasoning for the denial was based on the fact that no standard has been established for perchlorate cleanup. Therefore, cleanup requirements for the perchlorate contamination cannot be defined fully.

Mr. Stachiw stated that the City of Aberdeen completed a Proposed Plan for Well 9 to install an ion-exchange treatment unit to capture contaminants. The system would be installed at the expense of the City of Aberdeen. If the system is successful, the treatment system may be installed on more wells in the future. Mr. Stachiw stated that he met with the City of Aberdeen during February to pass on his knowledge of the ion-exchange treatment system.

Ms. Young stated that the City of Aberdeen told the citizens that the project is a study and that the system will cost approximately \$33,000. The City was then supposed to forward the results of the study to the residents.

Mr. Stachiw stated that Mr. Henry had proposed, based on past funding issues, that the annual Installation Action Plan (IAP) workshop take place in the evenings to allow RAB Members to attend. In the past, the workshop took place over several days during one week. If the requested change in schedule were suitable for RAB Members and regulators, Mr. Stachiw indicated that the Army Environmental Center (AEC) would be contacted to try to arrange the IAP workshops for evening hours. Due to the large investment of time required to attend the workshop, Mr. Stachiw RAB Members to provide feedback regarding interest in attending the workshops.

Mr. McWilliams asked for a detailed explanation of the IAP workshop. Mr. Stachiw explained that the workshop evaluates all 250 sites at APG one by one. Each site is evaluated based on what is known about the site to determine the best course of action for cleanup and the associated cost estimates. A plan is developed as to how to move forward for each site. The costs are estimates derived from RACER, an Army program that estimates cleanup costs based on different types of actions that would be implemented. The actions and costs are projected for the current fiscal year out into future years. Mr. Stachiw explained that the workshop is held once each year, and has been an annual event for the past four years.

Mr. Roy Dietz (RAB Member) asked who generally attends the IAP workshop, and expressed concern that the RAB was not involved until after the workshop was completed and a budget was set. Mr. Stachiw explained that, in the past, RAB Members and APGSCC members have been invited to the meetings. During the past several workshops, Dr. Cal Baier-Anderson (University of Maryland, former Technical Assistance Grant consultant) attended on behalf of the RAB. Representatives from the Environmental Protection Agency (EPA) and Maryland Department of the Environment (MDE) also attend the workshop. Mr. Rich Isaac (AEC) explained that the IAP workshop is an intense two-to-four day meeting with a large workload. Mr. Stachiw agreed with the intensity of the workshop due to the large number of sites evaluated.

Mr. McWilliams asked when the workshop would take place. Mr. Stachiw replied that the workshop is usually held during the first week of April. During the RAB budget meeting in December 2003, Mr. Henry had expressed his desire to be in attendance for the 2004 IAP workshop. Mr. Stachiw stated that the RAB Members will be polled to determine how many members would be interested in attending the workshop. Based on the interest level, the workshop may be scheduled for several evenings in a row. Mr. Stachiw stated that additional alternatives for the meeting may be identified, but a minimum of 16 working hours would be required. Mr. Stachiw explained that Mr. Henry had expressed concern because most RAB Members work during the day and would be unable to attend the workshop if it was held in the same manner as in the past.

Mr. McWilliams stated his interest in attending the meeting, but stated that his attendance would be dependant upon the scheduling of the workshop. Mr. Stachiw stated that a write-up will be prepared detailing the exact workshop schedule, and then each RAB Member can decide whether or not to participate.

Mr. Crabb asked how far into the future planning is carried for each site. Mr. Stachiw explained that planning is carried far out into the future. However, planning for the “out-years” is not as intensive. Certain formulas are used to provide cost estimates for actions such as long-term monitoring and operations and maintenance. For example, if you know when a certain machine will start operating and you know it is going to take 20 years, a cost can be estimated for operations. Another example would be prorating costs associated with monitoring every two years for 30 years. Those calculations are not labor intensive. What is labor intensive in the workshop is evaluating each site and determining what actions need to be implemented.

#### **IV. PERFORMANCE-BASED CONTRACTS DISCUSSION**

Mr. Stachiw stated documentation has been provided to the RAB Members containing information about different elements that would be included in a Performance-Based Contract (PBC) for the Other Aberdeen Areas (OAA) Study Area at APG. The OAA is comprised of a number of sites with soil contamination, and six or seven plumes of groundwater contamination.

Mr. Stachiw stated that the information provided is not the entire contract; some items are restricted due to the procurement process. Included in the package are the elements of concern, and other extracted information that the RAB members may review. The draft contract is pre-decisional. Mr. Stachiw reminded RAB Members that two types of PBCs have been discussed at RAB Meetings thus far; a PBC where a ROD is already in place, or about to be in place, and a PBC where a ROD has not been made, and only a Draft Feasibility Study is in place. The draft contract provided to RAB Members is similar to the implementation of a PBC when a Draft Feasibility Study is in place.

Mr. Stachiw introduced Mr. Isaac and Mr. Randy Cerar (AEC) to answer any questions regarding the draft PBC. Mr. Stachiw explained that Mr. Isaac prepared the draft contract with the assistance of Mr. Naren Desai (DSHE ECRD Project Officer for OAA). Mr. Stachiw stated that he would like the RAB Members to provide feedback on the proposed PBC.

Mr. Stachiw pointed out highlights of the proposed PBC. The contract sets the goal for the contractor to cleanup the sites to Response Complete. The contract also states that, in order for the contractor to receive payment, they must receive concurrence from the Army, EPA, and MDE. The contract also requires the contractor to obtain and address comments from the general public, RAB members, and the APGSCC. The contractor requirements are the same as the requirements under current IAG contracts.

Mr. Stachiw explained that in order to move ahead with the contract, it is necessary to get concurrence from the regulators and to address citizen concerns.

Mr. McWilliams asked for clarification for Item 7 of the contract, with regard to outreach and the Administrative Record. Mr. Stachiw explained that, in general for current contracts, GP has provided oversight for the majority of outreach projects such as the RAB meetings and public meetings associated with RODs. GP handles the outreach even if another contractor is preparing the ROD. For example, assume EA Engineering is completing a ROD or Proposed Plan. In general, because GP has the community relations contract, GP would handle the meeting setup and public notifications. Under the proposed PBC, the contractor doing the cleanup will be responsible for the community relations and outreach under the guidance provided in the contract.

Mr. Stachiw stressed that the RAB structure would be unchanged, but the contractor would have to provide support to the RAB meeting. Mr. Stachiw stated that currently, many contractors attend the RAB meetings to provide support to the Project Officers by answering questions or providing additional information about site activities. Mr. Stachiw stated that the IRP is coordinating with AEC to determine the exact responsibilities for the contractor under the proposed PBCs.

Mr. Dietz asked when the document was distributed to the RAB members. Mr. Stachiw explained that the draft PBC should have been sent out several weeks prior to the February 2004 RAB meeting. Mr. Stachiw spoke to Ms. Christine Grochowski (RAB community co-chair, Foster Branch homeowners association), who was unsure if she distributed a copy. Mr. Stachiw indicated that a copy of the PBC could be e-mailed to all RAB members. Mr. Dietz stated that he never received a copy of the document. Ms. Young offered to let Mr. Dietz review her copy of the proposed contract.

Ms. Young asked for Mr. Frank Vavra's (EPA) position with regard to the possible implementation of PBCs at APG. Mr. Vavra explained that the EPA is waiting to review the specifics of the PBC for the OAA. The finalized proposed contract has not been submitted to EPA for review. Several other issues are also tied into the PBC including groundwater policy for the seven plume areas within OAA. It will be important to evaluate how the groundwater plumes will be remediated under a proposed PBC for the OAA. Mr. Vavra stated that earlier concerns emerged due to possibly having a large number of Guaranteed Fixed Price Remediation (GFPR) contracts for many sites in the Edgewood Area. With the implementation of PBCs, the process is becoming more targeted. The EPA's general concern is that adequate oversight is in place, regardless of the contract mechanism used. The proposed PBCs appear to require adequate oversight. Mr. Vavra stressed the importance that the EPA has to have a line of direct communication with the Army, without the EPA going directly to the contractor.

Ms. Young asked for MDE's opinion on the implementation of PBCs. Mr. Butch Dye (MDE) stated that a meeting was held with Mr. Cerar to discuss MDE's concerns that were outlined in a letter submitted to the Army from MDE's acting Secretary Philbrick. The biggest concern related to not having a remedy in place, therefore leaving some uncertainty with the contract. Mr. Dye explained that underlying concerns exist at the State level with regard to staffing and workload in the context of the timeline of the contracts. Mr. Dye stated that the MDE's resources may be a little insufficient, but the Agency is investigating possible alternatives to deal with the staffing issue.

Ms. Young stated that Mr. Dye touched upon one of her concerns when speaking about the lack of resources. She expressed her concern that there will not be enough money to allow for adequate staffing to provide sufficient oversight for the projects. Ms. Young stated that the EPA and MDE want to do their jobs well, but if they are overloaded with work, it becomes too demanding to keep up with what is

expected of them, therefore putting the Agencies in bad light and making the process unproductive. Ms. Young stated that this issue is an overwhelming concern with the implementation of the PBCs.

Mr. Vavra stressed that the process is ongoing and all problems and concerns of the Agencies must still be worked out. Mr. Vavra recently met with Mr. John Paul (DHSE ECRD Project Officer) to discuss the approach to OAA. The approach has changed recently from an all-encompassing ROD to five documents and five FSs, thus creating 10 documents to be reviewed by EPA and MDE. Mr. Vavra agreed with Ms. Young that resource issues exist and need to be addressed. Mr. Vavra stated that the process is moving forward and working toward a solution, but that does not ensure that the Army will be completely happy with how the process works out on the EPA side. The EPA does not currently have any more resources to devote to the Army contracts. Mr. Vavra explained that he will be getting help because the EPA is hiring a new employee, but at the same time, Federal Facilities activities have been taking up two-thirds of the technical resources of EPA including hydrogeologists and toxicologists. The Federal Facilities group is under directive to cut their resources almost in half because of workload pressures from the private sector. Mr. Vavra explained that there are clearly resource issues, but the EPA will do its best to resolve any issues. Mr. Vavra stated that the EPA has not been able to keep up with the document review in the past. He stated that he has documents in his office that are year and a half old that he hasn't had a chance to review due to his efforts being focused on issues such as security and perchlorate contamination. In addition to the OAA documents, Mr. Don Green (DSHE ECRD Project Officer) notified Mr. Vavra of seven to nine documents that will be submitted to EPA for review in the near future. Also, a No Further Action document is being submitted for review that addresses 53 Defense Site Environmental Restoration Tracking System (DSERTS) sites.

Ms. Young reiterated her deep concern regarding the available resources of EPA and MDE. She stated that, under the proposed PBC, she does not see opportunity for an adequate amount of oversight. Ms. Young cited several examples of past companies and situations where inadequate oversight has led to major problems. Examples included: Enron, WorldCom, Anderson, Baltimore City Community College construction, and the Baltimore City school system. Ms. Young stated her opinion that, by implementing PBCs, another glaring situation will arise. Ms. Young added that, as a result of the previous examples of inadequate oversight, an enormous amount of public trust has been lost. Ms. Young stated that additional alternatives should be identified that would allow for the appropriate amount of oversight.

Mr. Dietz agreed with Ms. Young. He stated that the Army claims a cost savings from switching the contract mechanism to a PBC, which will in turn make it easier to get work completed. This cost savings will be completed at the expense of the agencies having to review more documents. Mr. Dietz stated that, if in fact the document review will be holding up the process, the work will not be completed any sooner and the costs will get shifted from the Army to another Agency. Mr. Dietz reiterated his concern, suggesting that a review of the balance of costs be completed, not just from Army and contractor standpoints, but also from the standpoint of other agencies that will be affected.

Mr. Cerar stated that AEC strives to reduce the amount of documentation. The number one goal for the implementation of PBCs was to effectively package the sites to reduce the amount of primary documents that would have to go through review. Unless something has changed compared to what was originally proposed, the number of documents for review should be less than the original plan. Mr. Stachiw stated that he would review the proposed PBC to check on the amount of documentation required and compare it to the original plan.

Mr. Cerar stated that, if the amount of documentation has not been reduced, AEC has not completed their due diligence to effectively package the schedule. Mr. Cerar explained that when AEC met with the IRP, one of the primary goals was to create one document that would cover similar situations for "like" sites.

The combining of documentation would lessen the burden on all parties involved, both internally and external to the Army. Mr. Stachiw stated that a great amount of material must be included in documents, and the only difference between having one document or five documents would be the number of pages that comprise the document(s). The time required to review the information would not change. Mr. Stachiw stated that he would further investigate whether there is an efficiency, or lack of it, to condensing several reports into one document.

Ms. Bowling expressed her concern that there are no “like” sites within APG; all sites are unique with regard to cleanup issues. Mr. Isaac explained that actions are being expedited by the implementation of a PBC; additional actions are not being added. The actions and documentation listed in the PBC for Graces Quarters and OAA are the same as those actions that are currently scheduled. Actions were chosen that were already planned for and that AEC believed would work well under a PBC. Mr. Isaac stated his belief that using a PBC creates no additional work; the only difference is that a different method is being used to complete the work.

Mr. Vavra stated that the PBC itself is not the only outstanding issue. Several issues impact on the PBC, for instance for a long time a lot of the Aberdeen areas weren’t studied as specific study areas, and there are a large number of DSERTS sites. When risk assessors look at risk, they have to look at each DSERTS site individually, and regardless of whether the information is in one document or many, the same amount of information still has to be reviewed. Mr. Vavra stated that, if the number of documents is accelerating, it is a good thing for the Army in one way because it is reaching a point of closing out Remedial Investigations (RI), Feasibility Studies (FS), and completing proposed plans and RODs. Currently the EPA is in the process of commenting on two proposed plans and one ROD. The sheer volume of work for a study area is a result of schedules being shortened to a point to complete study phases and documentation, thus increasing the work for the Agency. In reviewing a document, the Agency must go through a cumbersome process to make sure all data are accurate and that the risks have been properly assessed.

Mr. Cerar stated that he was not advocating taking a document with 100 pages down to 10 pages, or taking 10 documents down to one document. But there are several Work Plans, FSs, RIs, and RODs that have a certain amount of boilerplate language repeated. Mr. Cerar agreed that, when dealing with risk assessments, it is understood that each site has to have its own risk assessment. Mr. Cerar agreed that every site is somewhat unique to itself, but there are several sites that have a solvent problem as the major theme for those sites. While each site has a unique background, they all share a common issue, providing a certain economy of scale to consider those sites together.

Mr. Stachiw stated his belief that some of the “like” sites were grouped together, but he pointed out that other sites have different issues such as plumes contaminated with explosives, and soils contaminated with lead. Mr. Stachiw stated that the amount of documentation would be dependant upon what is dictated within the PBC. The contractors may decide how many documents are produced, although they may be encouraged to produce fewer documents at a faster pace to receive their payment. Mr. Cerar agreed and stated that a tradeoff will have to be made between wanting to close out sites and having the ability to get the documentation completed in a timely manner.

Mr. Vavra added that the EPA is currently investigating internal ways to expedite the document review process. Mr. Vavra added that the Army is part of the Federal Government also and recognition should be given to all the hard work done by the Army personnel. One of the EPA’s concerns in early discussion of PBCs involved the possibility that the projects would be solely handed off to the contractor, thus resulting in the loss of expertise of the Army oversight personnel.

Mr. McWilliams stated that his concern exists that, by switching to the PBC mechanism, one or two big contracts would be generated for APG. In the past the Army has been operating with several different contractors, and if something goes wrong with the contract, not everything is lost. Mr. McWilliams explained that, for example, if there are two PBCs for APG, one covering all of Aberdeen Area and one covering all of Edgewood Area, the Army is taking a great risk. If something were to go wrong similar to what has been observed at other corporations in America, it would be a great loss. Mr. McWilliams added that his concern focuses on who is ultimately in charge of the contract and oversight of the projects.

Mr. Isaac explained that, currently, the IRP receives between \$19 and \$27 million in annual funding. The project officers are aggressive in generating documents, sometimes resulting in difficulty for the regulatory agencies to review the documents in a timely manor. Mr. Isaac explained that the IRP budget is unlikely to change, and the funding has been previously allocated to different projects. If the funding comes in under a PBC, funding will then be given to certain areas of the contract. Mr. Isaac stated that the amount of funding received for the IRP programs is the driver for the amount of documents that are produced. Therefore, if there is no increase in funding, there will be little to no change in the amount of documents generated. Mr. Isaac added that the IRP will work to reduce the number of documents generated, but a large number will still be produced and will need to be reviewed by the regulatory agencies. Mr. Stachiw agreed that the budget is stable and stated that he has been informed that the budget for project oversights is stable for the next Fiscal Year.

Mr. Stachiw stated that establishing different efficiencies of scale to make documents easier to review is a difficult task. The program currently has several generic health and safety plans to allow for easy review so that the safety officers can look at them to make sure things get done in the correct manner each time without having to read the same document multiple times. Mr. Stachiw explained that there might be ways of doing more generic documents for the Installation when certain issues are similar. The generic documents would make things easier for the Army and regulators to review, for the EPA oversight, and for the contractor to finish the project. Combining documents in such a way may result in overall cost savings on the contracts. Mr. Vavra stated that the EPA is working with the Army to come up with a solution to the problem of document review.

Mr. Stachiw agreed, stating that both EPA and MDE are working with the Army to increase the efficiency of document review. No one wants oversight to be lacking; everyone wants the projects to be correctly completed. Mr. Stachiw stated that the Army is relying on the regulators and the RAB to assist in determining what needs to be done, and to ensure that all actions are correctly completed, so that the actions will not have to be repeated. The IRP will have to work at prioritization with MDE and EPA to keep the process moving along.

Mr. Stachiw, while referring to the proposed PBC, stated that the contract implies that the contractor does not proceed without first receiving concurrence from the regulators. Nothing is stated that requires the regulators to sign "x" number of documents each year, therefore the regulators are not forced into signing off on a document without thorough review. Mr. Stachiw stated that the regulators will receive documents, and they can perform their due diligence in their review, and approve the document upon concurrence.

Ms. Young asked Mr. Stachiw what immediate issues must be resolved with regard to the PBC process. Mr. Stachiw stated that he does not see any particular hurdle to overcome. Mr. Stachiw explained that a legal review of the document would be completed to ensure that the PBC would reach the desired outcome. Mr. Stachiw stated that, if the PBC is legally sufficient, and the Army and regulators concur, then the process can move forward. For the project to be successful it is critical to ensure that sufficient oversight of all actions occurs. Mr. Stachiw expressed concern that it is important for the contract to be

written in such a way that a situation does not arise in which the contractor fulfills the contract and is paid; yet the job was not done satisfactorily and the Army has to complete the work themselves. Mr. Cerar stressed the importance of an effective contract. The work should get completed and be correct. The schedule and efficiency are secondary issues. The contract has to be effective to be able to hold the contractor responsible for creating effective documentation and completing the work at the site.

Mr. Crabb asked what the assurance is that the contractor will not get bought out or sold, or file bankruptcy. Mr. Cerar stated that the risk under a PBC is similar to the risk that exists under any current contract. Mr. Cerar reported that several companies have been bought out in the past even on non-PBCs. When researching a contractor it is important to look at issues such as financial solvency, strength, the company's ability to get bonded, and their past performance record. Mr. Cerar explained that under an insurance policy, if the Army elects to use one, the contractor and an underwriter can be held accountable for any failure. No contract carries a 100% guarantee, PBC or non-PBC, that the contractor will not have financial complications in the future. The Army has not observed any financial problems with the 14 PBCs that are currently in place.

Mr. Vavra asked if the contractor gets paid upon completion of milestones. Mr. Cerar agreed, stating that the PBC promotes progress for the contractor to reach milestones so they can receive payment. Mr. Cerar explained that not all of the money for the contract is funded up front. The monies are obligated against the contract, but it is only paid as progress is made. Mr. Cerar explained, that in a worse case scenario, if some type of problem occurs with a contract in the future, the Army would not lose all the revenue associated with the contractor. Mr. Cerar does not anticipate any future problems with the PBCs. The Army has observed great success with the existing PBCs.

Mr. Stachiw stated that the proposed PBC mechanism is not very different from the existing Fixed Price contracts that are in place at APG. For example, with one contract, one of the pieces of equipment failed and the contractor is replacing the equipment at their own cost. Mr. Stachiw reiterated that, under a PBC, the contractor has an incentive to get done, because no payment will be made until the contract obligations are met. Under the proposed PBC, the Army and regulators still have a great deal of control over the process. Mr. Stachiw stated that the regulators have expressed to him that, if a problem occurs with a project, the regulators will deal directly with Army personnel and hold them responsible for the site being completed, as opposed to going through the contractor.

Ms. Young asked if there has been any discussion regarding completing a two-year roundtable to evaluate sites and scenarios. Mr. Stachiw stated that the request for a roundtable was noted as an action item, and he would check into the status of the item. Mr. Stachiw reiterated that the proposed PBCs would not be very different than current Fixed Price contracts used at APG. For example, certain projects (i.e., Carroll Island, New O-Field) in theory would not have been a good fit, but APG has made them work under Fixed Price contracts. No cost overruns were observed, and in some cases the contractor completed additional work at no extra cost to the Army. One difference with PBCs is the implementation of milestones, but overall, the incentives are generally still the same for the contractor to complete the work.

Mr. Cerar passed out a handout containing answers to questions that were raised with regard to PBCs. As requested at the 5 December 2003 RAB Meeting, Mr. Cerar also distributed an organizational chart, complete with a list defining all acronyms listed on the chart. Mr. Cerar encouraged the RAB Members to look over the document and contact him or Ms. Janet Kim (AEC) with any further questions or concerns. Ms. Kim has been working on the PBCs guidance for the Army.

Mr. Cerar stated that, while moving forward with the PBCs, outstanding issues still need to be addressed. He reiterated his concern over documentation. Mr. Cerar explained that documentation is the "throttle" of

the process because the process becomes stalled if the documents do not get reviewed in a timely manner. Moving forward, an adjustment needs to be made, either to match the resources to the “throttle” size or figure out a way to make the “throttle” bigger. Mr. Cerar stated that it is not beneficial for a backlog of documents to be created, thus preventing the Army from moving forward on projects. The backlog could result in the documents becoming antiquated over time. Mr. Cerar stated that, while evaluating Installations across the Army, feedback is being received that an improvement can be made in effectively packaging documentation. There are certain opportunities to condensed documentation, although it is unrealistic to think that two reports can be combined, resulting in only half of the data being needed. Certain portions of reports are site-specific and will be unique, but many portions include boilerplate language and contain commonalities between documents. A balance must be established as the process moves forward.

Mr. Stachiw stated that, based on his discussion with Mr. Paul, the risk assessment for OAA was already in the form of a large document. The document is now being divided into smaller documents to facilitate completion of the review process. Mr. Cerar agreed, stating that a discussion should be held to determine how the documents could be packaged effectively so that the Army, regulators, and RAB members can process the documents and complete as much work as possible within the schedule outlined for the site.

Mr. Cerar requested that the RAB members review the distributed documentation, and encouraged anyone with further questions to contact him or submit the questions in writing. Mr. Cerar reported that information regarding PBCs can be found on the AEC website, and additional information is listed on the National Aeronautics and Space Administration’s (NASA) website. Ms. Kim explained the steps needed to access the PBC information on AEC’s website: choose divisions, choose cleanup divisions, and then choose PBC hot topics. Under the PBC information, the site includes links to other agencies within the Federal Government that use PBCs.

## **V. INTERMISSION**

At 8:10 p.m., after confirming that no one present had further questions, Mr. Stachiw requested a 15-minute break. At 8:25 p.m. the meeting resumed and Mr. Stachiw introduced Mr. John Wrobel (DSHE ECRD Project Officer) to provide an update on the Canal Creek Study Area.

## **VI. CANAL CREEK STUDY AREA UPDATE**

Mr. Wrobel thanked RAB members for the opportunity to present an update on the Canal Creek Study Area. Mr. Wrobel displayed a slide containing a photograph of a heron taken by his son that was included in the Harford County Emergency Planning Calendar. Residents of Harford County receive the calendar, which contains wildlife pictures submitted by community members, in the mail.

The Canal Creek Study Area is located in the Edgewood Area of APG. Mr. Wrobel stated that he would be providing an update on specific areas including East Branch Canal Creek, West Branch Canal Creek, Railroad Yard, G-Street Salvage Yard, DM Filling Plant, Building E5185, Building 99, and Building 103.

### **East Branch Canal Creek**

Mr. Wrobel displayed a map depicting a groundwater contaminant plume in the Canal Creek area. A large groundwater plume, oriented from west to east, affects the East Branch of Canal Creek. A ROD called for the installation of a groundwater extraction system to capture and treat contaminated groundwater in the area. As a result, eight extraction wells that bisect the plume have been installed. The original line for groundwater capture was the 100 parts per billion (ppb) line, indicated on the map in red

dashes. Following a year of groundwater extraction, the line has regressed to the location of the black line on the map. Extraction lines are represented in yellow, and treated groundwater is discharged into the East Branch of Canal Creek. Based upon analysis of well monitoring results, containment has been achieved.

Mr. Wrobel displayed a slide depicting a flow diagram of the Groundwater Treatment Plant (GWTP) process for extracted groundwater. Groundwater passes from the East Canal Creek aquifer, through the extraction wells, and into equalization tanks. Water then moves into a metals precipitation step, created due to the amount of iron present in the aquifer. At this step, lime, polymer, and alum are added to induce coagulation and clarification. Remaining particulates pass through sand and bag filtration stages. A bag filter is a fine mesh bag that filters fine particulates out of the water stream. Water then moves into the stage of volatile organic compound (VOC) removal by resin adsorption, followed by surface water discharge into East Branch Canal Creek.

Mr. Wrobel stated that all of the water tanks throughout the treatment plant are covered to prevent the discharge of VOCs into the atmosphere. Granular activated carbon is used to adsorb VOCs in the vapor phase, and resins adsorb VOCs in the liquid phase. However, as VOCs are adsorbed, the resins will reach a point where further adsorption is not possible. A resin cleansing process was added, whereby steam created by the waste management plant is used for onsite resin regeneration. Concentrations of VOCs are then disposed of offsite.

Mr. Dietz asked if the red dashed line on the plume map indicates where the plume originally started. Mr. Wrobel stated that the red dashed line indicates where the plume began, and reiterated that the line has regressed.

Mr. Dietz noted that the plume appears to be stretching toward the west, while the southern line has regressed. Mr. Wrobel introduced Mr. Matt McCaughey (Weston Solutions), who is one of the geologists that designed the extraction system. Mr. McCaughey stated that operation of the extraction system began in April 2003, and the data presented on the plume map is from September 2003, at approximately the six-month mark. Most concentrations observed were comparable to the baseline values, with some concentration increases to the west. It appears that TCE concentrations are increasing slightly in the western area as the aquifer responds to pumping stresses. Additional monitoring data is needed to evaluate the situation.

Mr. Dietz added that, when comparing the initial plume data to the current sampling data, the overall size appears to be the same, only shifted to a different shape. Mr. Dietz speculated that one year of operation may be too soon to see the effects of the pump and treat system. Mr. Wrobel agreed, stating that one of the nice things about the system is that the extraction wells have variable speed pumps that can pump up to 40 gallons per minute for each well. Currently the pumping has been optimized for a certain type of capture, as more data is collected the pumping rates can be adjusted when necessary to allow for optimum capture.

Mr. Crabb asked for the direction of the water flow. Mr. Wrobel explained that the normal gradient allows for water flow in a southeasterly direction. Mr. Wrobel added that, from the 1940s until the 1970s, the Edgewood Area had several production wells that pumped approximately 1 million gallons of water per day for drinking water. As a result the natural groundwater flow was altered; otherwise the plume would flow in a more southerly direction.

Mr. Wrobel reported that the plant was initially designed for a high concentration of iron based on sampling results from the aquifer. When the system was started, sampling results showed that the iron concentrations were lower than originally observed in the aquifer. As a result, the process of optimizing the metals precipitation was difficult. Mr. Wrobel stated it was discovered that the sand filtering step

was not capturing enough particulate matter. Instead, a great amount of material was being captured in the bag filters, resulting in having to change out the bag filters more frequently than anticipated. Mr. Wrobel stated that it was determined that installation of a sludge recycling loop would allow material to be recirculated through the metals precipitation step. The recirculation loop improves precipitation, reducing loading to the bag filters.

Mr. Wrobel stated that the GWTP has been operating since April 2003, but has been shut down since 6 February 2004 due to a failure of the gearbox assembly in the line mixer. A new gearbox had to be ordered and fabricated. Currently, the gearbox assembly is being installed in the GWTP.

Mr. Wrobel stated that while investigating the optimization of the sludge system, the coating on the interior of Ambersorb vessels was observed to have great amount of premature failure. A coating expert was called in to evaluate the vessels, and the result of the evaluation was inconclusive. As a result, a procurement is underway to fabricate more durable stainless steel Ambersorb vessels. The vessels are scheduled for installation during March 2004.

Mr. Crabb questioned the reason for the gearbox failure. Mr. Wrobel stated that an investigation is ongoing to determine why the gearbox prematurely failed. Several mechanical engineers from the Baltimore District Corps of Engineers plan to visit the site to evaluate the failed gearbox. Possible reasons for failure include improper maintenance, wrong application of the equipment, or normal wear and tear. If it is determined that the box is likely to fail after one year of use, extra gearboxes will be ordered to have on hand in case of failure to assist in timely replacement of the equipment.

Mr. Wrobel reported that approximately 70 million gallons of groundwater have been treated. All GWTP effluent has met the National Pollutant Discharge Elimination System (NPDES) equivalency permit requirements. The capture zone of the plume has been developed in accordance with ROD requirements and the extraction system is operating as designed at design flow.

Mr. Wrobel presented several slides listing process changes for the GWTP. As previously reported, the gearbox associated with the lime reaction tank mixer failed on 6 February 2004, resulting in plant shutdown pending replacement. Mr. Wrobel reported that vapor phase methane was detected by routine vapor sampling during start-up operations. A monitoring plan was developed with the assistance of MDE to prevent any releases of methane into the atmosphere. Monitoring is conducted weekly during plant operations. Concentrations have remained essentially constant over the operating period, and are well below the explosive limit.

Mr. Wrobel informed the RAB Members that an alum addition process was added to assist the lime in the settling of solids. Polymer and pH adjustment were specified in the design for solids settling, but after operations began, the process was modified to include alum addition, thus enhancing system performance in settling solids.

Mr. Wrobel reiterated that, during plant operations, the sludge recycling loop was added to increase process efficiency. Mr. Wrobel stated that jar testing was conducted in which different concentrations of lime, alum, and polymer are added to the influent water and mixed. The methodology was used to determine the optimal dosage for maximum solids removal.

Mr. Wrobel displayed a slide detailing the Ambersorb vessel replacement. The design originally specified lined carbon steel Ambersorb vessels for VOC removal. The Ambersorb regeneration process occurs under high pressure and temperature conditions. Mr. Wrobel reiterated that soon after plant operations began, signs of vessel coating failure were observed. Coupon testing was conducted to find an appropriate replacement coating, but all coatings tested were deemed unacceptable. As a result, the

vessels were slated for replacement with stainless steel vessels. Installation of the replacement vessels is anticipated during March 2004.

Mr. Stachiw requested that Mr. Wrobel explain the contract for the GWTP. Mr. Wrobel explained that the contract is a firm fixed price (FFP) contract. Under the FFP, the contractor had the design parameters associated with the plant, and designed it for a firm fixed price. The contractor delivered the design ahead of time and at a cost below the firm fixed price that was specified in the contract. Mr. Wrobel added that all equipment replacement is being completed at the contractor's expense, with no additional cost to the government. Mr. Wrobel stated that the FFP is similar to how a PBC or GFPR would work with the end result being that the plant would be operational and anything that malfunctions would be replaced at the cost of the contractor.

Ms. Young asked how long the GWTP systems were expected to be operational. Mr. Wrobel explained that the steel Ambersorb containers should not have failed, and were anticipated to last approximately 10 to 12 years. The gearbox failure is still under investigation to determine the cause. Possible reasons for failure include possible manufacturer's defect, improper maintenance schedule, or improper application of equipment. Mr. Wrobel reiterated that engineers from the Baltimore District Corps of Engineers would evaluate the gearbox to assist in the investigation.

Mr. McWilliams asked if the contractor was operating the GWTP. Mr. Wrobel stated that the contract involved the design, build, and operation of the plant. The structure of the contract allowed for optimization of money that was spent on the contractor because the contractor had to operate the plant that he designed, giving incentive for an optimal design. Mr. Wrobel added that this extra month that the contractor is working for replacement of equipment is being completed at the cost of the contractor. The contractor must then demonstrate that the equipment replacements will solve the operational failures and ensure optimal plant operations. Mr. Stachiw reiterated the success observed at APG is a result of FFPs that have been implemented during the past decade.

Ms. Young agreed that the FFPs have worked well in situations with specific projects where the actions are well defined. Mr. Wrobel stated that, with regard to the GWTP, the contractor was given the ROD performance standards and a 30 percent design to work with, making the project ideal for a FFP. The design/build/operate structure provided payment to the contractor upon completion of design, construction, and then upon operation of the facility, giving the contractor incentive to complete a good design and build the facility in a timely manner. Under the FFP, the contractor invoices the Army for monthly progress payments. For example, the contractor would invoice for labor for a specific time period. When equipment arrived, the contractor was not paid for the equipment until the equipment was installed and demonstrated to work as intended. This approach provided the contractor incentive to place orders and efficiently schedule installations.

Mr. Stachiw questioned the status of using the Canal Creek GWTP for potable water. Mr. Wrobel stated that the State provided questions regarding the potential use for potable water. The Army provided responses to the questions but has not received any feedback from the State regarding the responses. Mr. Wrobel added that the operational data would be gathered to show that the water is in compliance with drinking water standards.

Mr. Wrobel compared the GWTP to a "cradle to cradle" approach. The goal is to avoid managing waste as "cradle to grave" and producing wastes in the process. The "cradle to cradle" approach would involve managing materials to create a useable end product. In this case, steam from the waste-to-energy plant is used to assist in GWTP processes, with an end product from the plant being potable water. Mr. Wrobel stated that the process is close to "cradle to cradle", but some waste streams are produced from the plant. Mr. Wrobel reported that the GWTP was rated Silver as a sustainable building. By contrast, a Platinum

building, like the Chesapeake Bay House in Annapolis, contains all waste, nothing leaves the building, and all waste in the building is reused.

#### West Branch Canal Creek Study Area

Mr. Wrobel displayed a map of the Canal Creek Study Area, pointing out the location of the West Branch of Canal Creek. A groundwater divide exists and is generally located along Hoadley Road. The West Branch of Canal Creek is a meandering stream that is filled with wetlands and phragmites. Upland areas surround the wetland locations. In marshes where groundwater flows up through the sediments, remediation can occur through natural attenuation.

Mr. Wrobel reported that current activities are being focused on the upland delineation of the groundwater plume. A wetland investigation and pilot study will also be completed including field acclimation testing for a bacterial consortium, geotechnical analysis at a pilot test site, pilot testing of a biomat, and surface water sampling and analysis. Both the upland and wetland investigations will lead to the RI/FS, Proposed Plan (PP), and ROD.

**Upland Groundwater Plume Delineation:** Mr. Wrobel stated that site contaminants included multiple source areas of chlorinated VOCs resulting from historical site activities. Sampling detected chlorinated ethenes and ethanes including 1,1,2,2-tetrachloroethane (TeCA) and 1,1,2-trichloroethene (TCE). Chlorinated methanes such as carbon tetrachloride (CT) and chloroform (CF) were also detected. The site geology is comprised of unconsolidated sediments with a mix of sand, clay, and silt. An upper confining unit is present that separates the surficial aquifer from the Canal Creek aquifer. The site hydrogeology indicates that the VOC plumes are flowing west toward the wetlands and natural attenuation is occurring in the wetlands in areas except at the identified seep locations.

Mr. Wrobel reported that the scope of the RI for the upland site involves Cone Penetrometer Testing/Direct Push Technology (CPT/DPT) hotspot plume delineation. Mr. Wrobel explained that CPT/DPT works like a well except it is faster, less costly, and can be removed upon completion of sampling. The data is then used to install more permanent monitoring wells. The RI scope also involves surface media sampling for Building E5188, monitoring well installation, groundwater sampling, well assessment and abandonment, updated plume delineation assessment, and natural processes assessment.

Mr. Wrobel explained that the CPT/DPT sampling was completed at a total of 45 locations, with 22 locations being taken at depths greater than 60 feet. Vertical profiling was completed at each sampling location by collecting two or three groundwater samples per hole. Samples were taken from the first saturated sand, and two samples were taken in the aquifer. Mr. Wrobel displayed a slide depicting a sample CPT log. As the cone is pushed in, the pressure generated establishes a profile and identifies the sediments as sand, clay, or silt and also identifies the location of the aquifers.

Mr. Wrobel reported that maximum sampling detections in the Canal Creek aquifer include a TeCA concentration of 4,700 ppb at CPT-18, and CT concentrations up to 2,700 ppb at CPT-17. Concentrations detected between Building 99 and Building E5185 included 4,700 ppb of TeCA (CPT-18), 2,700 ppb of CT (CPT-17), and 2,600 ppb of TeCA (CPT-28). A 1,000-ppb VOC hot spot extends to the groundwater divide with detection such as 2,400 ppb TeCA and 1,400 ppb CT at sampling location CPT-31. A 1,000-ppb hot spot also extends south of Building E5185, evident by the TeCA detection of 2,000 ppb at CPT-25. For the east bank of the wetlands, the contamination is greater at depth along the east side of the Creek. No contamination was detected along the west bank of the wetlands.

Mr. Wrobel displayed a plume map showing the areas of TeCA detections and the CPT/DPT sampling locations. Mr. Wrobel pointed out the hot spot areas and the proposed locations chosen for the

installation of monitoring wells. The monitoring well locations were selected based on the CPT/DPT results. The monitoring well locations will provide additional sampling points to further define and treat hot spot locations and to further delineate the location of the groundwater divide.

Mr. McWilliams questioned the TeCA concentrations located on the southwestern portion of the map. Mr. Wrobel explained that the area is a hot spot location close to the West Branch Canal Creek. The area is very close to the location of historical chemical manufacturing plants and could have possibly been used as a disposal location.

Mr. Wrobel displayed maps showing the CT plume detections and the proposed monitoring well locations for the West Branch Canal Creek. Sampling from the monitoring wells will assist in the further delineation of the groundwater plume.

Mr. Wrobel reported that upcoming fieldwork for the upland area includes the installation of six new monitoring wells to further identify the chemicals of concern. New and existing wells will be sampled for Target Compound List (TCL) VOCs, TCL semivolatile organic compounds (SVOCs), TCL pesticides and polychlorinated biphenyls (PCBs), total and dissolved Target Analyte List (TAL) metals, explosives, chemical agent degradation products, gross alpha and gross beta, natural attenuation parameters, and perchlorate.

**Wetland Area Investigation:** Mr. Wrobel displayed a map depicting the West Branch of Canal Creek, noting that the creek extends almost to the Installation boundary. The Creek was divided into four regions for the purposes of seep delineation. After observing natural attenuation occurring in the wetland sediments, a flyover with thermal infrared (TIR) technology was completed to identify any groundwater discharge points into Canal Creek. The flights have been conducted for the past 3 years, with the 2004 flight taking place on 26 February 2004. The 2004 results will then be compared to the 2002 and 2003 results. The first two years had similar identifications of groundwater seep locations.

Mr. Crabb asked for the altitude at which the flyovers are conducted. Ms. Emily Majcher (U.S. Geological Survey (USGS)) stated that the flyovers were conducted at altitudes of 100 to 200 feet. Mr. Wrobel stated that the resolution of the over flights are incredible, giving the ability to see objects such as deer.

Mr. Wrobel displayed a conceptual model showing cross sections of the wetland areas, at the creek bank, and at the middle of the creek. Some seeps are evident along the stream bank and in the Creek, while others are only identifiable at low tide. The models depict the theories as to how the groundwater is flowing and ultimately discharging into the West Branch Canal Creek.

Mr. Wrobel reported that the shallow groundwater sampling was completed using passive diffusion samplers. The technology involves inserting a bag of permeable material into the aquifer and a compound is diffused into the bag at a known rate. The bag is then removed and analyzed after a specified period of time. From a practical standpoint the bags are attractive to rodents. Therefore, mesh screens were placed around the bag to deter rodents and minimize damage.

Mr. Wrobel informed the RAB members that the 2003 sampling effort focused on Regions 2 and 3. The VOC detections were similar to the previous sampling results. Mr. Wrobel displayed a slide showing the seep locations within Regions 2, 3, and 4. The map also detailed the seep sampling results from the Spring 2002 and 2003. Mr. Wrobel stated that a biomat would be installed at seep location 3-4W in an attempt to reproduce the natural attenuation with manufactured material.

Mr. Wrobel displayed a conceptual model of natural processes that are occurring in the wetland areas of the aquifer. The groundwater is coming up through the aquifer through several different mechanisms including sorption, volatilization, and transformation. The processes are treating the VOCs in the groundwater and degrading them to a point where they are not being detected in the surface water.

Mr. Wrobel reported that bacterial consortium testing was conducted in an attempt to recreate the naturally occurring bacteria found in the wetland sediments that is responsible for the degradation of VOCs. The goal of the testing was to establish a stable, sediment-free mixture of organisms capable of rapidly and simultaneously degrading the target compounds. The target compounds included TeCA, TCE, 1,2-dichloroethene, vinyl chloride, and CT. The bench-scale testing has been completed, and based on those results, either consortium WBC1 or WBC2 will be used in the 2004 pilot study. The bacteria making up WBC1 is native to the sediments.

Mr. Wrobel displayed a slide detailing the development of biomats. The general design framework must be evolved and potential materials for use in the mat must be identified. An evaluation was completed of hydraulic, physical, and chemical properties of seep sites and of mat materials. Bench-scale tests will be completed to evaluate the degradation, sorption, and bioaugmentation on select mixtures. Mr. Wrobel displayed a slide showing the bacterial consortium bench testing results, noting that WBC1 appeared to create the most degradation target compounds.

Mr. Wrobel stated that up-flow columns are being created and tested to collect actual data to determine how much flow should come up through the biomat. The testing is completed using different materials such as geotextiles. The testing will establish similar discharge rates and concentrations, with and without culture added, as are exhibited in the wetland areas of Canal Creek. Evaluations will be completed on sediment only, bion mix overlying sediment, and an iron and bion mix. Measurements will be made for VOC concentrations, redox, culture behavior, and hydraulic properties. Mr. Wrobel passed around a mason jar filled with a sample of the biomat component material without the bacteria.

Mr. Wrobel reported that the enhanced bioremediation study involved the completion of bench tests to determine the best combination of biostimulation and bioaugmentation techniques for the degradation of VOCs. Potential bioaugmentation options include planned installation of thin, enhanced peat anchored on the surface (biomats), and subsurface injections into existing peat. Three sites were evaluated for pilot study. The sites were selected based on contaminant mixture and concentration, location, hydrologic properties of seep sediments during the tidal cycle (seepage meters), chemical properties of porewater (including VOCs and redox) in the vertical profile (peepers), microbial properties of sediment (community comparison), and surface water synoptic of VOCs and major ions. Ultimately seep location 3-4W was selected for pilot study.

Mr. Wrobel displayed a slide showing a conceptual model for the enhanced bioremediation study. The field testing of potential seep treatments is planned for fiscal year 2004 to 2005. The conceptual model compared the degradation of parent VOCs to daughter VOCs for both biomats and subsurface injections into the existing peat.

Mr. Wrobel displayed several slides detailing the planned Fiscal Year 2004 (FY04) activities for the West Branch Canal Creek Study Area. A phased approach to pilot test technologies will be completed. A geotechnical characterization will be completed including grab core samples, UXO clearance, and monitoring well installation. Field readiness testing will be conducted including leach tests on mat materials, pathogen analysis on cultures, and WBC1 deployment in wetland sediments. The monitoring system design and installation will include the determination of monitoring system requirements, UXO clearance, installation, development, and testing of monitoring devices, and determination of hydraulic

integrity of the pilot-test area. Direct injection and reactive biomat pilot test installation and monitoring will be completed.

#### Canal Creek Study Area Operable Units

Mr. Wrobel displayed a map depicting the locations of selected Canal Creek Study Area Operable Units (OUs). The World War II (WWII) Railroad Yard, G-Street Salvage Yard, and DM Filling Plant were grouped together for study, as they were located along the northern boundary of the Canal Creek Study Area, and close to the Installation boundary. The Final RI for that study area was issued in January 2004, and the FS is currently being prepared. The information from the Final RI will be used to create remedial alternatives, which will be incorporated into a Proposed Plan.

Mr. Wrobel displayed a slide providing a brief site history for the G-Street Salvage Yard. The site served as a railroad siding area during WWI, a salvage yard from WWII to the late 1960s, a disposal site for scrap metal recovered from open burning pit disposal operations at O-Field and J-Field, a burn residue disposal area (BRDA) for burning pit residue, former fire training area for fire departments from 1972 to 1978, and a site for some smelting operations for lead recovery.

Mr. Wrobel displayed a slide that contained photographs of the salvage yard, and continued a description of the site history. The salvage yard Removal Action was conducted in 1990, and involved the removal of surface items, and the excavation of partially buried items. Following the Removal Action, concentrations of chemical warfare materiel (CWM) were detected. GB bomblets, and mustard blast containers were recovered. In 1991, a fence was installed around the area for security. During 1991, erosion to the site occurred, and items rose to the surface. The items were removed, and in 1996 under the Emergency Measures Action, a temporary sand cover was placed over the BRDA until a permanent remedial alternative could be devised.

Mr. Stachiw noted that coordination with OPSEC was a large concern at that time. Mr. Wrobel stated that OPSEC felt that the erosion condition coupled with the surfacing of items presented too great a security issue. A temporary emergency measure was devised for the interim, until a final remedial action was prepared for the site. Mr. Stachiw noted that the interim solution was not environmentally protective, but intended for minimal human protection, as well as to address OPSEC concerns.

Mr. Wrobel displayed a slide providing a brief site history of the DM Filling Plant. The plant was used in the late 1940s for DM (Adamsite) manufacturing and filling activities. The plant was used to manufacture and mix irritant or colored smokes, loading bombs, Napalm B, and charcoal impregnation and blending following the end of DM production. Pre-1970s, wastewater from the plant was drained to sewers with outfalls and ditches leading to the Western Branch of Canal Creek. Arsenic was a major component of DM, and is still detected at the site.

Mr. Wrobel displayed a slide providing a brief site history of the WWII Railroad Yard. The site was a staging and maintenance area for railroad equipment from WWII to the 1960s. Waste practices at that time involved the discharge of waste and cleaning chemicals into adjacent low-lying areas and drainages that feed into the West Branch of Canal Creek.

Ms. Ruth Ann Young (RAB Member) asked for an explanation of charcoal impregnation and blending. Mr. Wrobel explained that in WWI peach pits were ground up and used in gas masks as a filter media. However, ground peach pits did not protect soldiers well once chemical weapons began to improve. It was discovered that charcoal could better adsorb organic vapors, and it was then used in gas masks. Further improvements yielded vapors that could penetrate the charcoal. Charcoal in gas masks was then

ventilated and impregnated with chromium, which better adsorb organics that would penetrate into the mask.

Mr. Wrobel displayed a slide listing RI conclusions at the Salvage Yard. Soils at the Salvage Yard contain concentrations of metals, PCBs, and other chemicals at the surface and at depths, and show some level of human health and ecological risk. The BRDA area still contains some unexploded ordnance (UXO), and CWM in disposal pits. The groundwater, as shown on previous charts, flows into the West Branch of Canal Creek. The presence of a chlorinated solvent in the groundwater will be addressed as part of the West Canal Creek Area Plume RI/FS.

Mr. Wrobel displayed a slide listing RI conclusions at the DM Filling Plant. Arsenic has been detected in and adjacent to drainage ditches. Groundwater in this area will also be addressed as part of the West Canal Creek Area Plume RI/FS.

Mr. Wrobel displayed a slide listing RI conclusions at the WWII Railroad Yard. Surface soils were found to contain metal and polyaromatic hydrocarbons (PAH) around the former maintenance shop. Detections of DDT, DDD, and DDE were found in sediments, and exceeded preliminary remediation goals (PRGs). Groundwater in the Railroad Yard will be addressed as part of the West Canal Creek Area Plume RI/FS.

Mr. Wrobel displayed a slide listing FS alternatives for the Salvage Yard. Current alternatives for the soil include no action, institutional controls, installation of a low permeability cover, installation of a Resource Conservation and Recovery Act (RCRA) specified cap, and excavation and off-site disposal. A preferred alternative has not been identified. Possible alternatives for the BRDA area include no action, improving and extending the existing cover, and excavation and off-site disposal.

Mr. Tom McWilliams asked if manganese contamination resulted from steel corrosion. Mr. Wrobel stated that the contamination most likely was the result of steel corrosion. Mr. Mike Ervine (Shaw Environmental) stated only one detection of manganese was reported above PRGs.

Mr. Wrobel displayed a slide listing FS alternatives for the DM Filling Plant. Possible alternatives include no action, excavation and off-site disposal, and phytoremediation. Arsenic is a chemical that can be phytoremediated. Plants exist that will thrive in an area of high arsenic concentrations. Evaluations of how long clean up would take must be made. Phytoremediation is a personal favorite alternative to Mr. Wrobel, as it does not entail simply covering over the site.

Mr. Wrobel displayed a slide listing FS alternatives for the WWII Railroad Yard. Possible alternatives for the soil and sediment include no action, and excavation and off-site disposal. Phytoremediation is not a possible alternative at this site. Another possible alternative in the FS pertains to the habitat enhancement. Following excavation, the resulting hole can either be left to fill up with water, or be filled in. Instead of bringing in clean fill for the hole, the opportunity exists to enhance the habitat. Adjacent to the area where a driving track was installed, a sediment pond was created. The sediment pond catches runoff, and provides a wonderful habitat for frogs and salamanders. This concept could be incorporated as an alternative use for excavated areas.

Mr. Wrobel displayed a slide detailing the projected schedule of activities for the three sites. Scheduled are a Final FS for Spring 2004, Proposed Plan for Summer 2004, Draft ROD for Fall 2004, and Remedial Action for 2005.

#### Mercury Detections

Mr. Wrobel displayed a slide presenting information on the detection of mercury in the West Branch area of Canal Creek. Available mercury data was summarized from 1993 to 2000 for evaluation of Canal Creek habitats. Analytical and bioassessment evaluations, including surface water, sediment, fish tissue, benthic invertebrate tissue, and plant tissue concentrations were conducted to determine if mercury had begun to bioaccumulate, and move up the food chain. Clam and submerged aquatic vegetation (SAV) tissue data were inconclusive, and do not seem to present a current issue. Bioassays were performed on sediment samples with the crustacean *L. plimulosus*, and on surface water samples with the fathead minnow *Pimephales promelas*, to evaluate the potential for bioaccumulation in those areas. Study efforts with regard to mercury will continue.

Mr. Wrobel displayed a slide presenting information on mercury in Canal Creek surface water. Studies have shown that total mercury concentrations in surface water were comparable to reference site concentrations, and no apparent temporal or spatial relationships were observed. All mercury concentrations in surface waters were less than the USEPA's and MDE's current acute and chronic ambient water quality criteria for dissolved mercury, and do not appear to present a problem.

Mr. Wrobel displayed a slide presenting information on mercury in Canal Creek sediment. Sediments of the West Branch Canal Creek are contaminated with total mercury concentrations greater than or equal to 1 mg/kg in some areas, with a maximum mercury concentration detected at 149 mg/kg. Total mercury sediment concentrations were greater than reference site sediments in 75 percent of the samples collected. Ten sediment samples from the West Branch of Canal Creek had detections greater than 10 mg/kg of total mercury. The average of sediment concentrations has remained relatively constant, suggesting a localized historical upstream point source of mercury, and marginal downstream conveyance. The sediment issue needs to be evaluated, and work will be ongoing.

Mr. Wrobel displayed a slide presenting information on mercury in Canal Creek fish tissues. Total and methyl mercury concentrations in fish tissues were detected at higher concentrations than in fish tissues collected at reference sites, but were less than the USEPA's criterion for human fish consumption.

Mr. Wrobel displayed a slide presenting information on mercury in Canal Creek bioassays. Studies found that fathead minnow exposed to Canal Creek surface water had a 94 to 100 percent chance of surviving. At this point, surface water does not present a concern. Sediment studies yielded the same effect to crustaceans, whether they were exposed to locations of 149 parts per million (ppm) of mercury, or 0.4 ppm of mercury. The problem may be with the state that mercury is in, as some forms of rough mercury are more bioavailable than others, and other contaminants, which could contribute to toxicity, may be present. The impact of sediments on this particular bioassay is unclear. More data and interpretations are needed to determine the impact.

Mr. Wrobel stated that it must be determined if mercury is the sole source of contamination, or if co-contaminants are present. PCBs have also been detected in sediment samples. A chemical contaminant map should be constructed and overlain with toxicity results from bioassay studies, to evaluate tendencies and problem areas. Catfish and large mouth bass sampling results from the Fall 2003 sampling event still need to be interpreted to determine impacts on the food chain, and consumption issues. The problem must be defined before alternatives can be identified.

#### **IV. CLOSING REMARKS**

Mr. Stachiw stated that RAB member presentation packages should contain information, with regard to the RAB and RAB policy, from Department of the Army. He asked members to review it, and send in any comments.

At 9:35 p.m., after confirming that no one present had further questions, Mr. Stachiw adjourned the meeting. The next APG IRP RAB Meeting will be held on Thursday, 25 March 2004 at 7:00 pm in the Edgewood Senior Center. The topics of discussion will be a conclusion of the Canal Creek Study Area update, the J-Field Study Area update, and an update on Munitions Assessment Processing Systems (MAPS).