

MINUTES

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

THURSDAY, 29 APRIL 2004

7:00 p.m. – 9:30 p.m.

EDGEWOOD SENIOR CENTER

RESTORATION ADVISORY BOARD MEMBERS PRESENT AT THIS MEETING:

Ms. Mandi Elliott-Bird	Mr. Greg Kappler
Ms. Glenda Bowling	Mr. Ted Henry
Mr. Gary Browning (Alternate for Mr. Kevin Barnaba)	Mr. Thomas G. McWilliams
Mr. Arlen Crabb	Ms. Mary Moses (Harford County Emergency Operations Center)
Mr. Roy Dietz	Mr. Ken Stachiw (Army Co-Chair)
Mr. Butch Dye (Maryland Department of the Environment)	Mr. Frank Vavra (U.S. Environmental Protection Agency)
Ms. Christine Grochowski (Community Co-Chair)	Ms. Ruth Ann Young

RESTORATION ADVISORY BOARD MEMBERS NOT PRESENT AT THIS MEETING:

Mr. Dan Pazdersky	Mr. Dennis Warwick
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ENCLOSURES TO THESE MINUTES:

- 1: Roster of Meeting Attendees
- 2: Agenda
- 3: May 2004 Calendar of Events
- 4: Bush River 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 public meeting for Cluster 3 in the Bush River Study Area has been scheduled for 4 May 2004. Mr. Stachiw stated that a meeting for the Performanced-Based Contracting (PBC) board will be scheduled for sometime within the first two weeks of May 2004.

Perchlorate Detections Update

Mr. Stachiw displayed a slide depicting results from the latest round of perchlorate sampling. The perchlorate detections reported from the City of Aberdeen 20 April 2004 sampling event ranged from non-detect to 1.7 parts per billion (ppb). A result of 0.19J ppb was reported for the finished water. Sampling completed on the 27 April 2004 detected 0.78J ppb of perchlorate in the finished water. Mr. Stachiw reported that the City of Aberdeen Production (CAP) Well 9 is currently shut down. The well will be back in service pending the completion of the installation of the ion-exchange treatment system.

Bush River Study Area

Mr. Don Green (DSHE ECRD Project Officer) provided an update on the Bush River Study Area. Mr. Green provided updates on the Southern Bush River Operable Unit (OU) 2A (26th Street), Southern Bush River OU2B (Kings Creek Chemical Disposal Site and 30th Street Landfill), and the Southern Bush River OU3 (Bush River Radioactive Material Disposal Facility and 22nd Street Landfill).

26th Street Disposal Site

Mr. Green reported that the 26th Street Disposal Site was divided into two areas: the West Side, measuring approximately 0.7 acres, and the East Side measuring approximately 0.5 acres. The West Side contains burned and buried gas mask remnants lying on wooden railroad ties up to 6 feet deep. Test pit samples found metals concentrations above Risk Based Concentrations (RBCs). Marsh sediments located downgradient of the East side detected DDT_r at concentrations in exceedance of ecological risk screening levels. The Disposal Site was identified as a potential source of metals contamination in groundwater.

The Remedial Action objectives for the 26th Street Disposal site include protection of human and ecological receptors from risks associated with buried wastes and transport of metals into the adjacent wetlands, protection of groundwater quality, and management of wastes consistent with applicable or relevant and appropriate requirements (ARARs). The preferred alternative being proposed for the 26th Street Disposal site is waste excavation and on-site disposal of non-hazardous wastes.

Kings Creek Chemical Disposal Site/30th Street Landfill

Mr. Green reported that a pilot-scale treatability study is planned to build a constructed wetland along the banks of Kings Creek. The preliminary schedule involves ongoing site characterization and data collection, and the implementation of a constructed wetland and shoreline stabilization. The design and bench-scale treatability study will take place from May 2004 through August 2004. Mobilization of the pilot scale study will take place between October and December 2004. Construction of the wetland will take place from December 2004 through March 2005. Vegetation will be planted in the Spring 2005. Monitoring and evaluation will continue throughout the design, construction and implementation of the project.

Dr. Dennis Burton (University of Maryland Wye Research and Education Center) reported on the Kings Creek Chemical Disposal Site and 30th Street Landfill sediment toxicity evaluation. The toxicity evaluation involved 28-day survival, growth and reproduction tests conducted with *Hyaella azteca* and *Leptocheirus plumulosus*. Comprehensive chemical analyses of the sediments were completed. Results included toxicity observed through reproductive effects on *Hyaella* at one site and two sites for *Leptocheirus*.

Bush River Radioactive Material Disposal Facility

Mr. Green reported that the objective of the non time-critical removal action at the RAD Yard is to excavate and remove soils contaminated with radioactive materials and arsenic so that residual soil concentrations are below cleanup goals. The removal action also includes the demolition and removal of five buildings, concrete slabs, and the wastewater system associated with the RAD Yard. The contaminants of concern identified for the RAD Yard include Cesium-137, Cobalt-60, and arsenic. The sequence of work for the removal action will include building assessments, Level B chemical warfare materiel (CWM) screening under the concrete slabs and around the wastewater system, building demolition, excavation of radiological and arsenic contaminated soils, wastewater system removal, slab removal, soil verification sampling, and site restoration.

22nd Street Landfill

Dr. Burton provided an update on the 22nd Street Landfill sediment toxicity study. The toxicity study involved 28-day sediment toxicity bioassays conducted with *Hyaella azteca* and *Leptocheirus plumulosus*. Comprehensive chemical analyses of the sediments were completed. Toxicity was observed for *Leptocheirus* at one location during the Fall 2000 study, and at three locations during the Summer 2001 study. Study results indicated a reduction in *Leptocheirus* reproduction in four of 14 samples was not related to any single known priority pollutant with an established sediment benchmark. It did not appear that the interaction of multiple known contaminants caused a reduction of neonate production.

An additional identical sediment toxicity study was completed during the Summer 2003. Results indicated that none of the sediments at the seven stations effected the survival, growth, or reproduction in *Hyaella* or *Leptocheirus*. Four pesticides (DDD, DDE, DDT, and dieldrin) were found to exceed the Biological Technical Assistance Group (BTAG) or National Oceanic and Atmospheric Administration's (NOAA) Effects Range Low (ER-L) sediment screening levels at two stations. Two pesticides (DDT and DDE), were also found in exceedance of screening levels at one station. Six heavy metals (arsenic, copper, lead, mercury, nickel, and zinc) were found at concentrations exceeding BTAG's or NOAA's ER-L screening levels. Results indicated that the metals were bound, and thus not available to cause toxicity. The lack of toxicity indicates that the ER-L is very conservative as a screening value for the two test amphipods exposed to arsenic in sediments that have high total organic compound concentrations and high silt/clay content.

Southern Bush River Schedule

Mr. Green reported that the schedule for the OU1 includes completion of a Draft Feasibility Study (FS) report in October 2004, Draft Proposed Plan (PP) in April 2005, and a Draft Record of Decision (ROD) in July 2005. The schedule for OU2A includes completion of a Draft PP in February 2004, and Draft ROD in June 2004. The schedule for OU2B includes completion of a Draft FS in June 2004, Draft PP in July 2004, and Draft ROD in September 2004. The OU3 schedule includes completion of the Draft FS report in May 2004, Draft PP in July 2004, and a Draft ROD in October 2004.

II. OPENING REMARKS AND ADMINISTRATIVE COMMENTS

The April 2004 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 (ECDR); Army Co-Chair) at 7:00 p.m. on Thursday, 27 April 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 May 2004 (Enclosure 3), and a copy of the Bush River Study Area presentation (Enclosure 4).

Mr. Stachiw reported a public meeting for the Graces Quarters Proposed Plan (PP) was held on 27 April 2004. The PP will address the groundwater for the Graces Quarters Study Area. The meeting was very well attended. Mr. Stachiw stated that a public meeting to discuss the lead contamination in Bush River Cluster 3 has been scheduled for Tuesday, 4 May 2004.

Mr. Stachiw informed the RAB Members that a meeting for the Performance-Based Contracting (PBC) board will be scheduled for sometime within the first two weeks of May 2004. The meeting will provide an opportunity to analyze and discuss one of the PBCs that has been disseminated. Mr. Don Green (DSHE ECRD Project Officer) added that the Graces Quarters PBC will be sent out during the first week of May 2004.

Mr. Ted Henry (RAB Member) requested, if the PBC board meeting will be held during the week of 10 May 2004, that the meeting not be scheduled for Tuesday evening. Mr. Stachiw stated that a consensus of all members of the committee will be obtained to determine the most agreeable date and time for the meeting.

Mr. Stachiw reported that a discussion of the Installation Action Plan (IAP) workshop will be held after the break. Due to the need to discuss cost-sensitive information, the discussion will be held with RAB Members only. All contractors and other meeting attendees will be asked to leave the room.

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 a slide depicting results from the latest round of perchlorate sampling. The perchlorate detections reported from the City of Aberdeen 20 April 2004 sampling event ranged from non-detect to 1.7 parts per billion (ppb). A result of 0.19J ppb was reported for the finished water. Sampling completed on the 27 April 2004 detected 0.78J ppb of perchlorate in the finished water.

Mr. Stachiw reported that the City of Aberdeen Production (CAP) Well 9 is currently shut down. The well will be back in service pending the completion of the installation of the ion-exchange treatment system. Ms. Glenda Bowling (RAB Member, Aberdeen Proving Ground Superfund Citizen's Coalition (APGSCC)) stated that the filter has been installed on CAP well 9, and the City is waiting for the resin to arrive to complete the installation of the system. The resin is expected to arrive in approximately two weeks, and testing will be completed on the well before pumping is resumed.

After confirming RAB Members had no further comments, Mr. Stachiw introduced Mr. Green to provide an update on the Bush River Study Area.

IV. BUSH RIVER STUDY AREA UPDATE

Mr. Green informed the RAB Members that the Bush River Study Area (BRSA) is a 500-acre peninsula that extends into the Bush River. Mr. Green stated that he will provide an update on the Southern Bush River Operable Unit (OU) 2A including the 26th Street Proposed Plan (PP); Southern Bush River OU2B including the Kings Creek Chemical Disposal Site and 30th Street Landfill; and Southern Bush River OU3 including the Bush River Radioactive Material Disposal Facility Removal Action and 22nd Street Landfill Characterization.

Mr. Green displayed a map of the BRSA and reminded the RAB Members that the area has been divided into three areas including Cluster 3, Northern Bush River Area, and the Southern Bush River Area. The Northern Bush River Area Remedial Investigation (RI) did not identify any environmental problems with the exception of above ground septic tanks that are recommended for abandonment. A PP has been published for the Cluster 3 area to excavate lead-contaminated soil. The proposed action will be covered in more detail at the public meeting scheduled for 4 May 2004.

26th Street Disposal Area Proposed Plan

Mr. Green stated that the Draft PP for the 26th Street Disposal Area has been distributed for review. Mr. Green displayed a map and informed the RAB Members that the area is divided into the West Side, measuring approximately 0.7 acres, and the East Side, measuring approximately 0.5 acres. The East Side was used historically as a drum disposal site and was discovered to contain radiological contamination. Previously, the area was excavated to Nuclear Regulatory Commission (NRC) standards.

Mr. Green reported that the West Side contains burned and buried gas mask remnants up to a depth of six feet, and lying on wooden railroad ties. Test pit samples contained metals (lead, chromium, and silver) above Risk Based Concentrations (RBCs). Marsh sediments downgradient of the East Side were found to contain DDT at a concentration of 9,370 ppb, exceeding the ecological risk levels.

Mr. John Fairbank (Maryland Department of the Environment (MDE)) asked if samples were taken from beneath the railroad ties. Mr. Green explained that no samples were taken from beneath the railroad ties. Mr. Tom DeReamer (General Physics Corporation) added that the railroad ties were located only a few feet above the groundwater level.

Mr. Green explained that one of the concerns of the 26th Street Disposal Site is that the site has no vegetative cover, thus allowing for potential leaching of contaminants into the groundwater.

Mr. Henry asked for the reason why the railroad ties were in the 26th Street Disposal Site area and asked if the ties were laid out evenly. Mr. Green explained no determination has been made as to why the railroad ties are located in the area, and stated that the ties were laid out evenly. Mr. Green stated that it is unclear whether the material was burnt in the pit or if the ties were used as a pit lining with other materials piled on top of the ties.

Mr. Green reported that the Remedial Action objectives for the 26th Street Disposal site include protection of human and ecological receptors from risks associated with buried wastes and transport of metals into the adjacent wetlands, protection of groundwater quality, and management of wastes consistent with Applicable or Relevant and Appropriate Requirements (ARARs). The preferred alternative being proposed for the 26th Street Disposal site is waste excavation and on-site disposal of non-hazardous wastes.

Mr. Green stated that several remedial alternatives were considered for the 26th Street Disposal Site. The first alternative would involve No Action costing \$80,000 and is comprised of long-term monitoring and site closeout with applicable documentation. Alternative 2 would involve waste excavation and off-site disposal of wastes at a cost of \$2,961,000. Alternative 3 considered waste excavation and on-site disposal of non-hazardous wastes, costing \$1,883,000. The on-site disposal could be included as fill material underneath a landfill cap. The last alternative considered, Alternative 4, would involve capping the site with continuing groundwater monitoring and land use controls, costing \$2,321,000. Mr. Green stated that the drawbacks for Alternative 4 would be leaving the waste in place, with the possibility that the waste would have to be excavated at a later date if it contributes to groundwater contamination.

Mr. Green reported that, after consulting with the Environmental Protection Agency (EPA) and MDE, the preferred alternative was determined to be Alternative 2: waste excavation and on-site disposal of non-hazardous wastes. The excavated soils and wastes that are deemed non-hazardous based on Toxic Characteristic Leaching Procedure (TCLP) screening and other reuse criteria, would be removed from the 26th Street Disposal Site and reused at APG for approved applications such as structural fill under landfill caps. The hazardous materials would be disposed of at a permitted, off-site, hazardous waste site.

Mr. Fairbank inquired if the masks would be considered non-hazardous wastes and would be used as fill under a landfill cap. Mr. Green clarified that only the non-hazardous soils would be used as structural fill material under landfill caps.

Mr. Green stated that the PP for the 26th Street Landfill has been distributed to the Army, EPA, and MDE. Ms. Christy Donhauser (DSHE ECRD) added that the PP is currently under internal review. Mr. Green stated that the PP will be distributed to the RAB and APGSCC upon completion of the internal review. Mr. Stachiw added that General Physics Corporation will notify the RAB Members when the document becomes available, and will provide copies to anyone wishing to receive a copy. Mr. Frank Vavra (EPA) stated that the EPA is currently prioritizing document review, and has not yet commented on the supporting documentation for the 26th Street Landfill PP.

Mr. Henry asked if the supporting documents or the PP would contain information regarding the depth of the excavation, and what steps will be taken after removing the railroad ties. Mr. Green stated that the information would be included in the PP or in a Record of Decision (ROD). Mr. Henry asked what document would contain information regarding the confirmation sampling plan. Mr. Green stated that an additional sampling plan will be drafted after the completion of the PP.

Kings Creek Chemical Disposal Site/30th Street Landfill

Mr. Green informed the RAB Members that the Kings Creek Chemical Disposal Site is located on the southwestern portion of the Bush River peninsula. During 2003, glassware was exposed as erosion occurred on the shoreline. A time-critical removal action was completed to remove the glassware.

Mr. Green reported that the current plan for the Kings Creek site is to implement a pilot-scale treatability study to further stabilize the site and evaluate several remedial alternatives. The pilot-scale treatability study will be completed in the field and will involve the implementation of a constructed wetland. The wetland would provide containment for any remaining waste and metals contamination. The metals identified at the site include arsenic and mercury. Mr. Green displayed a slide depicting a cross-sectional diagram of the proposed Kings Creek constructed wetland. Mr. Green pointed out several areas on the diagram including the bank of Kings Creek where the glassware was found and 2-inch diameter gravel and sand used for temporary stabilization of the bank. Mr. Green stated that the stabilization is temporary because the gravel and sand will erode under wave action or storm surge.

Mr. Green stated that, APG is completing bench-scale testing with the Engineering Division of Louisiana State University and Dr. John Pardue. Mr. Green explained that Mr. Pardue is an expert in constructed wetlands. The bench-scale treatability study is being completed to determine the appropriate combination of organic and inorganic materials, such as peat and sand, for capturing metals or other contaminants moving out of the site. Mr. Green stated that, for the pilot-scale treatability study, additional sand or fill material will be added to the existing gravel. Coconut fiber logs, used to resist erosion, will then anchor the fill material, and additional gravel will be added to increase stability. More design work will be completed with wave analysis experts to determine the type of offshore barrier that will be necessary. A marsh would be created by planting vegetation to capture any contaminants moving into Kings Creek. Sampling will be completed after the study to determine the amount of contaminants that are being captured by the wetland system.

Mr. Fairbank asked for Mr. Green to point out, on the cross-section, the water level at extreme high tide. Mr. Green explained that during an extreme high tide, such as during a hurricane, the water would overwash the marsh area. A typical high tide would come up to the top of the bank. Mr. Green explained that the contaminants in the groundwater are going to be flowing through the temporary shoreline stabilization and coming up through the wetlands. Modeling will be completed to determine exactly how wide this wetland has to be to capture the contaminants. Mr. Fairbank asked if piezometers have been installed to determine the waterflow beneath the area of the proposed marsh. Mr. Green stated that an evaluation will be completed to evaluate the flow.

Mr. Greg Kappler (RAB Member, various groups) asked how many cubic yards of suitable fill will be used in the constructed wetland. Mr. Green stated that a calculation would have to be made to determine the exact amount of suitable fill needed. Mr. DeReamer stated that the wetland would extend approximately 20 to 30 feet off of the existing temporary shoreline. Mr. Green added that the shoreline is approximately 100 feet in length. Mr. Kappler suggested that Mr. Green investigate the possibility of partnering with the Maryland Port Administration (MPA) for use of dredged materials as suitable fill material. Mr. Green stated his belief that the area would require only a small amount of material and therefore would not justify the cost of placing dredged materials. Mr. Green also pointed out the difficulty in maneuvering a barge into the area to place the material due to the shallow water of Kings Creek.

Ms. Ruth Ann Young (RAB Member) asked for the frequency of sampling for the constructed wetland. Mr. Green stated that the sampling plan has not yet been devised, but speculated that quarterly sampling for several years would be necessary.

Mr. Henry asked if the purpose of implementing a constructed wetland is to prevent further erosion from occurring in the vicinity of the previously identified disposal area at Kings Creek. Mr. Green stated that the constructed wetland will prevent further erosion, but will also capture and treat any organics or metal contamination coming out of the site.

Mr. Crabb asked if there is a possibility that glass vials remain in the water of Kings Creek. Mr. Green stated that offshore sweeps will be conducted to ensure no waste debris remains in the water. During the glassware cleanup that was completed in 2003, operations extended approximately 20 feet into the water to remove any glassware that was observed. As part of the clearance for the wetland location, there is a strong possibility that munitions will be identified. Personnel from U.S. Army Technical Escort Unit (TEU) will be contacted to remove the munitions and take them, most likely to the N-Field bunker for storage and then destruction at the Munitions Assessment and Processing System (MAPS) facility. Mr. Crabb questioned if the wetland construction will extend an additional 30 feet into the Creek past the

temporary shoreline constructed during the time-critical removal action. Mr. DeReamer confirmed that the constructed wetland will extend approximately 20 to 30 feet from the existing temporary shoreline.

Mr. Kappler informed the RAB Members and Mr. Green that a Bill was passed by the Legislature that addressed innovative uses of dredged materials. The State has mandated the MPA to identify potential innovative uses. Mr. Green stated that dredged material could possibly be used as the fill material needed underneath of the bedding material. Mr. Kappler reiterated his suggestion that the constructed wetland fill could serve as a partnering opportunity between the MPA and the Army, possibly reducing costs of the wetland construction. Mr. Kappler stated that, due to shallow water conditions, the material could possibly be brought to the site for placement by truck. Mr. Kappler added that the MPA is under pressure to identify potential innovative use options, even for small quantity placement options. Mr. Henry asked if the dredged material must be sampled before a disposal area is selected. Mr. Kappler clarified that the dredged material he was referring to would be from the Chesapeake Bay channels. Dredged materials from the Inner Harbor must be placed in a containment site due to the potential for contamination of the material.

Mr. Green reported that the preliminary schedule involves ongoing site characterization and data collection, and the implementation of a constructed wetland and shoreline stabilization. The design and bench-scale treatability study will take place from May 2004 through August 2004. Mobilization of the pilot-scale study will take place between October and December 2004. Construction of the wetland will take place from December 2004 through March 2005. Vegetation will be planted in the Spring 2005. Monitoring and evaluation will continue throughout the design, construction, and implementation of the project.

Mr. Green stated that a sediment toxicity evaluation is being completed for the Kings Creek Chemical Disposal Site and 30th Street Landfill area. Mr. Green introduced Dr. Dennis Burton (University of Maryland Wye Research and Education Center) to provide an update on the toxicity evaluation.

Dr. Burton provided a background for the toxicity study. Phases I and II of the Focused Feasibility Study (FFS) concluded that several chemicals of potential concern (COPC) are present in the near shore sediments. The Southern Bush River Remedial Investigation (RI) Report recommended that additional work be carried out to evaluate potential remedial alternatives for the site. The sediments for the evaluation were taken from seven stations along the shoreline of Kings Creek. Reference sediment was taken from Saltpeter Creek.

Mr. Henry asked for the location of Saltpeter Creek. Mr. Stachiw responded that Saltpeter Creek is located between Carroll Island and Graces Quarters. Dr. Burton added that sediments from Saltpeter Creek have been used multiple times in the past, as reference samples for toxicity studies.

Dr. Burton displayed a map depicting the seven soil sampling locations along the Kings Creek shoreline. Sampling locations SD-33 and SD-35 displayed toxic effects during the study. Sampling for the toxicity study was completed several months after the installation of the temporary shoreline at the Kings Creek disposal site location.

Dr. Burton reported that the sediment toxicity evaluation involved 28-day survival, growth and reproduction tests conducted with *Hyaella azteca*, an Epifaunal amphipod and *Leptocheirus plumulosus*, an Infaunal amphipod. Comprehensive chemical analyses of the sediments were completed. Toxicity results for sample location SD-33 showed toxic effects in reproduction for both *Hyaella* and *Leptocheirus*. Sample location SD-35 showed toxic effects for growth and reproduction in the *Leptocheirus*.

Dr. Burton explained the simultaneously extracted metals:acid volatile sulfide (SEM:AVS) ratio. A high volume of AVS will bind the SEM metals, causing the metals to be non-bioavailable, thus preventing toxicity. SEM metals could include copper, lead, mercury, nickel and zinc. If the ratio is less than 1, low toxicity effects result. If the ratio is above 5, toxic effects are observed.

Dr. Burton reported that the SEM:AVS ratio at sample location SD-33 was 2.8, indicating that the SEM fraction was not totally bound and may have contributed to toxicity. An arsenic (not a SEM) concentration of 27.6 parts per million (ppm) was found at SD-33, exceeding the Biological Technical Assistance Group's (BTAG) screening level of 8.2 ppm. This arsenic detection was the highest concentration found in the seven sampling locations. Other sites at Kings Creek had lower arsenic concentrations, but all detections exceeded the BTAG screening level.

Dr. Burton informed the RAB Members that, at sample location SD-35, concentrations of 4,4'-DDD, 4,4'-DDE, arsenic, and copper were found to exceed the BTAG or National Oceanic and Atmospheric Administration's (NOAA) Effects Range Low (ER-L) sediment screening levels. Eight high molecular weight polycyclic aromatic hydrocarbons (PAHs) were also present at SD-35 but concentrations were below screening levels. A white "crusty" material present in the sediment suggests that burned organic material may have been disposed of at the site.

Mr. Green asked if identification had been made of the white "crusty" material. Dr. Burton explained that the material was not identified because the material was ground into the sediment sample during analysis.

Ms. Young questioned if the waste was burned before disposal at the site or if the material was brought to the site and burned on location. Dr. Burton explained that the evidence at the site suggested that the materials were burned at the location and shoved offshore for disposal. Mr. Green clarified that the waste may have been burned on site and eroded off the shoreline of Kings Creek.

Mr. Henry asked if Lewisite was found in any of the containers removed from the Kings Creek Disposal Site. Mr. Green stated that containers were found containing Lewisite, mustard, and other tear gas compounds. Based on historical records, activities at the site included burning of munitions and other wastes; therefore it was not a surprise to uncover such compounds.

Bush River Radioactive Material Disposal Facility

Mr. Green reported that the objective of the non time-critical removal action at the RAD Yard is to excavate and remove soils contaminated with radioactive materials and arsenic so that residual soil concentrations are below cleanup goals. The removal action also includes the demolition and removal of five buildings, concrete slabs, and the wastewater system associated with the RAD Yard.

Mr. Green informed the RAB Members that radiological contamination detected at the RAD Yard included Cesium-137 at concentrations up to 4,620 picoCuries per gram (pCi/g), Cobalt-60 at concentrations up to 4.47 pCi/g, and arsenic at concentrations up to 56.2 ppm. The cleanup criteria agreed upon with EPA and BTAG are for industrial site use. The cleanup criteria for the contaminants of concern are 5 pCi/g for Cesium-137, 0.5 pCi/g for Cobalt-60, and 10 ppb for arsenic. Mr. Green stated that originally the site was going to be cleaned up to unrestricted residential use criteria. The residential use criteria was not used due to the close proximity of the 22nd Street Landfill and the residential use criteria for Cesium-137 and arsenic being almost equivalent to background levels.

Mr. Henry asked if the cleanup criteria were driven by BTAG criteria or human health risk assessment criteria. Mr. Green stated that all cleanup levels are driven by human health risk. Mr. Green added that

by meeting human health standards, all contaminants would also be meeting ecological risk standards. Mr. Henry asked how the cleanup criteria for arsenic was reached. Mr. Green replied that the arsenic criteria was based on the industrial scenario in the risk assessment. Mr. Vavra added that the criteria is close to background level for arsenic which is approximately 4.6 ppm.

The sequence of work for the removal action will include building assessments to ensure no lead paint or asbestos, Level B chemical warfare materiel (CWM) screening under the concrete slabs and around the wastewater system, building demolition, excavation of radiological and arsenic contaminated soils, wastewater system removal, slab removal, soil verification sampling for arsenic, Cesium-137, and Cobalt-60, and site restoration.

Mr. Fairbank asked if the arsenic contamination is in separate areas from the radiological contamination. Mr. Green stated that the radiological contamination is located in several hotspots, while the arsenic contamination is spread throughout the entire RAD Yard site. After removing the radiological contamination, approximately two-thirds of the arsenic contamination will have been removed. Mr. Fairbank questioned if the confirmation sampling would include analyzing for radiological contamination in addition to arsenic contamination. Mr. Green stated that the confirmation sampling will include all contaminants of concern.

Mr. Kappler asked for an explanation of the process and timeline for soil removal and subsequent confirmation sampling. Mr. Green stated that after removal of soils, a sweep of the site is done with a meter to determine if any radiological contamination is present. With regard to arsenic contamination, based on soil profiles that have been collected, the majority of the contamination is located within the top two feet of soil. After removal of the two feet of soil, confirmation sampling will be completed to ensure that cleanup levels have been achieved. Mr. Kappler asked how quickly the results would be received from the analysis of the confirmation sampling. Mr. Green explained that, after excavation is completed and confirmation samples are collected, analysis results can be received within 24 hours.

Mr. Fairbank asked if an x-ray fluorescence (XRF) survey was completed for the area. Mr. Green stated that an XRF survey was not completed because the survey could not detect at a low enough concentration. Mr. Gary Nemeth (General Physics Corporation) agreed that the accuracy of an XRF would be insufficient for identifying contamination in the RAD Yard area.

Mr. Henry asked for reasoning why arsenic contamination would be found in the same area as the radiological contamination. Mr. Green explained that the RAD Yard is located adjacent to the Adamsite vaults that were closed under a previous action. Adamsite is an arsenic-based compound. Also, the site was historically used to store munitions.

Mr. Green displayed a map depicting the RAD Yard footprint where the removal action is planned. Mr. Green pointed out landmarks including sewer lines, pumps, and buildings that will be removed as part of the removal action.

Mr. Green displayed a slide detailing the Health and Safety Plan for the RAD Yard removal action. Building assessments will be completed to determine if any hazardous materials are present (asbestos, lead paint, etc.). If present, the materials will be removed by licensed personnel prior to building demolition. Additional Level B CWM screening will be completed under the building concrete slabs and around the wastewater system to ensure no chemical agents are present. During soil excavation, building demolition, and wastewater system removal, personal air monitoring and real-time air monitors will be used to protect worker safety. Perimeter air monitoring will be conducted to ensure contaminants are not leaving the site. Also, dust suppression will be administered when necessary.

Mr. Green displayed a chart showing the timeline for the RAD Yard non-time critical removal action. After the Work Plan is approved by the EPA, NRC, and MDE, site operations will begin. Coordination has been completed with all agencies to obtain proper licensing, sampling methods, and proper documentation. Cleanup of the site is anticipated to be completed within six months after the Work Plan approval.

Mr. Fairbank asked when MDE would receive a copy of the Work Plan. Mr. Gary Witmer (Weston Solutions, Inc.) stated that the Work Plan would be sent out during May 2004.

Mr. Vavra stated that APGSCC raised an issue several years ago because the aerial gamma survey completed in the past indicated radiological contamination spreading from the RAD Yard into the 22nd Street Landfill. Mr. Vavra explained that, after speaking with Mr. Nemeth, it is suspected that a mislocation occurred, thus resulting in contamination associated with the RAD Yard appearing to be in the 22nd Street Landfill area. Mr. Vavra stated that a walkover of the 22nd Street Landfill will be completed to confirm that no radiological contamination is present.

22nd Street Landfill

Mr. Green informed the RAB Members that the 22nd Street Landfill is the largest landfill at the Edgewood Area of APG, measuring approximately 8.6 acres. The landfill contains hazardous, municipal, military, and industrial wastes, and is located adjacent to the RAD Yard. The RI and risk assessment showed potential for toxicity from metals and organics discharging from the landfill. Mr. Green introduced Dr. Burton to provide an update on the 22nd Street Landfill sediment toxicity study.

Dr. Burton reported that sediment samples were taken from seven locations in the Fall 2000 and Summer 2001 in the tidal area of the Bush River adjacent to the Landfill and northeast of the RAD Yard. One sample was also collected from the control location in Saltpeter Creek. The toxicity study involved 28-day sediment toxicity bioassays conducted with *Hyalella azteca* and *Leptocheirus plumulosus*. Comprehensive chemical analyses of the sediments were completed. Dr. Burton displayed a map depicting the study sampling locations. The locations were placed approximately 100 feet offshore to capture the surficial aquifer plume that flowed in the offshore direction.

Dr. Burton stated that no toxic effects were observed for the *Hyalella* in the Fall 2000 or Summer 2001 sampling events. The Fall 2000 study resulted in toxic effects observed for reproduction in *Leptocheirus* at one study location. The Summer 2001 study resulted in toxic effects on reproduction in *Leptocheirus* at three study locations. Dr. Burton stated that the EPA is reevaluating the study results to determine the minimum significant difference of toxicity that can be detected from a reference soil. Based on the EPA discussions, only one of the toxic effects observed during the toxicity tests would be significantly different from the control.

Dr. Burton explained that the results from the Fall 2000 study found SEM:AVS ratios of less than 1 at all stations including Saltpeter Creek. The low ratios indicate that all SEMs were bound and therefore not bioavailable for toxicity. Phthalate was detected at four of the eight sediment sampling locations. Results from sampling location SD-36 detected a total of five semivolatile compounds.

Mr. Green asked for the location that was deemed significantly different than the control location. Dr. Burton explained that the EPA evaluation is ongoing and no exact determination has been made as to which locations are significantly different. Mr. Henry asked for clarification as to which location is significantly different. Dr. Burton explained that one of the toxic effects observed during the Summer

2001 sampling event has been preliminarily identified as being significantly different. Toxic effects were observed at sample locations SD-37, SD-38, and SD-39.

Dr. Burton reported that the results from the Summer 2001 study found SEM:AVS ratios of less than one at six of the eight stations. A ratio of 1.2 was detected at one of two stations where the *Leptocheirus* reproduction was inhibited. A semivolatile compound (4-methylphenol) was detected at all seven Bush River sampling locations.

Dr. Burton informed the RAB Members that, based on the results from the 2000 and 2001 studies, the reduction in *Leptocheirus* reproduction observed in four of 14 samples was not related to any single known priority pollutant with an established sediment benchmark. Dr. Burton reiterated that, based on EPA discussions regarding significant differences, the reduction in reproduction will only be valid at one of the 14 sample locations. Based on study results, it did not appear that the interaction of multiple known contaminants caused a reduction of neonate production.

Dr. Burton stated that based on remaining uncertainty for reasoning behind toxicity, an additional identical sediment toxicity study was completed during the Summer 2003. Sediment samples were taken from the Northern Drainage Stream (one at mouth, one upstream location), Southern Drainage Stream (one at mouth, one upstream location), three along the Bush River shoreline adjacent to the 22nd Street Landfill, and one at Saltpeter Creek. Dr. Burton displayed a map showing the sampling locations.

Dr. Burton reported that, none of the sediments at the seven stations affected the survival, growth, or reproduction in *Hyalella* or *Leptocheirus*. Four pesticides (DDD, DDE, DDT, and dieldrin) were found to exceed the BTAG or NOAA ER-L sediment screening levels at two stations. Two pesticides (DDT and DDE) were also found in exceedance of screening levels at one station. Pesticides are not bioavailable, and thus not toxic, because of high total organic compounds, high silt and clay content, and aging. Six heavy metals (arsenic, copper, lead, mercury, nickel, and zinc) were found at concentrations exceeding BTAG or NOAA ER-L screening levels. All of the metals except arsenic are SEM that bind with AVS. The ratio was less than 0.7 at all stations, indicating that the metals were bound and thus not available to cause toxicity.

Mr. Roy Dietz (RAB Member) asked if any conditions could exist that would cause the metals to become unbound. Dr. Burton explained that a lower pH, below 6, would cause the metals to unbind. The metals would then convert to the valent cation form, which is the most toxic.

Dr. Burton explained that arsenic is not a SEM, and thus may be bioavailable. Arsenic concentrations at three stations were slightly above (less than 20%) the ER-L of 8.2 ppm. The lack of toxicity indicates that the ER-L is very conservative as a screening value for the two test amphipods exposed to arsenic in sediments that have high total organic compound concentrations and high silt/clay content.

Mr. Henry asked if pore water discharges from the 22nd Street Landfill. Mr. Green stated that studies have indicated that volatile organic compounds (VOCs) are coming out of the Landfill. Mr. Green stated he was unsure as to how well the *Leptocheirus* and *Hyalella* would indicate VOC toxicity. Dr. Burton stated that the toxicity studies involve 28-day tests, and cautioned that all VOCs would be gone within 36 hours.

Mr. Kappler questioned if drought conditions observed in either 2000 or 2001 and a rainy season in 2003 would have affected the results from the toxicity study. Dr. Burton agreed that 2002 was the extreme dry year, and 2003 was very wet. Mr. Green added that the toxicity studies were not evaluating the water column, but rather testing the sediments.

Southern Bush River Schedule

Mr. Green stated that the schedule for the groundwater plume was pushed back due to comments received from the EPA. The EPA believed uncertainty existed with regard to the groundwater discharge locations, and the identification of some of the source areas. Money is being reprogrammed to allow for additional geoprobe sampling to be completed. The schedule for OU1 includes completion of a Draft Feasibility Study (FS) report in October 2004, Draft PP in April 2005, and a Draft ROD in July 2005.

Mr. Green reported that the 26th Street Disposal Site PP was completed in February 2004, and the Draft ROD is expected to be completed in June 2004. The schedule for OU 2B includes completion of a Draft FS in June 2004, Draft PP in July 2004, and Draft ROD in September 2004. Mr. Green added that the schedule for OU 2B may be pushed back based on the results of the toxicity studies, therefore pushing the ROD completion into Spring 2005. Mr. Green stated that the Draft FS report for the Toxic Gas Yard, RAD Yard, and 22nd Street Landfill will be completed in May 2004. The Draft PP is expected to be completed in July 2004, and the Draft ROD is expected to be completed in October 2004.

Mr. Crabb questioned, with regard to the cleanup of the Toxic Gas Yard and RAD Yard, if consideration had been given to the close proximity of the chemical demilitarization site, and Mr. Crabb questioned if the fence or road would be relocated. Mr. Green stated that coordination has been made with personnel from the Chemical Demilitarization Facility. The only conflict will occur when the ton containers are being moved into the facility, resulting in the contractor for the RAD Yard removal action not being granted access to the site. Mr. Crabb questioned if the conflict would affect the cost of the removal action project. Mr. Green stated that the project is funded by a fixed-price contract; therefore the contractor should have built costs into the contract to account for the conflict.

Mr. Henry asked what is planned for the 22nd Street Landfill. Mr. Green stated that most likely a cap will be installed to cover the landfill.

Ms. Young questioned if the asbestos being removed during building demolition at the RAD Yard would be taken to Building E5664 for disposal. Mr. Green stated that the only building demolition will involve two small buildings, one being a small shed. The amount of asbestos in the buildings has not been determined. Mr. Witmer added that only a small amount of asbestos exists on the site. The contractor is responsible for assessing asbestos contamination and removing it accordingly. Mr. Green stated that after asbestos removal, an assessment is done on the asbestos to identify any radiological contamination.

Mr. Henry questioned if a landfill cap for the 22nd Street Landfill would cover the stream areas. Mr. Green stated that the streams and drainage ditches would have to be reengineered to go around the landfill. Mr. Henry suggested giving consideration to the pH issue raised by Dr. Burton with regards to lower pH levels allowing metals to become unbound and becoming toxic. Mr. Green stated that consideration was also given to constructing a wetland off the toe of the landfill to help capture and treat metals and organics coming out of the landfill.

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.

VI. INSTALLATION ACTION PLAN DISCUSSION

A discussion of the Installation Action Plan for the Bush River, Carroll Island, and Graces Quarters sites was held. Meeting attendees included RAB Members, Mr. Stachiw, Mr. Green and Mr. Rich Isaac (Army Environmental Center (AEC)). Anyone wishing to obtain information regarding the details of the discussion should contact Mr. Stachiw.

VII. CLOSING REMARKS

At 9:30 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, 27 May 2004 at 7:00 pm in the Edgewood Senior Center. The topic of discussion will be the Other Edgewood Areas Study Area.