Plume Cleanup Team/Impact Area Review Team Meeting
Bourne Best Western
May 14, 2008
6:00 – 9:00 p.m.

Meeting Minutes

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Handouts Distributed at Meeting:

1. Responses to Action Items from the December 4, 2007 IART Meeting
2. Presentation handout: Remediation & Investigation Update
3. Presentation handout: Robotics Technology Demonstration
4. Presentation handout: Demolition Area 1 Groundwater Response Action Annual Update
5. Presentation handout: Petroleum Fuels Storage Area (PFSA) Update
6. Presentation handout: Firefighter Training Area 2 (FTA-2)/Landfill 2 (LF-2) Update

7. Presentation handout: Chemical Spill 10 (CS-10) Update
8. PCT/IART Meeting Evaluation Form

Agenda Item #1. Introduction, Agenda Review, and Approval of 4/9/08 PCT/IART Meeting Minutes, Approval of 12/4/07 IART Meeting Minutes

Mr. Field convened the meeting at 6:06 p.m. and reviewed the agenda. He asked if there were any changes or additions to December 4, 2007 Impact Area Review Team (IART) meeting minutes or the April 9, 2008 Plume Cleanup Team (PCT)/IART meeting minutes. No changes were offered and both sets of minutes were approved as written.

Agenda Item #2. Team Merger Update

Team Name

Mr. Field stated that one option is to continue to call the combined team the PCT/IART and another suggestion is to call it a Restoration Advisory Board (RAB). He then asked if any team members had a suggestion for a name. Mr. Cambareri offered "Sagamore Lens Groundwater Cleanup Team" as a possible name.

Ms. Grillo noted that the Massachusetts Department of Environmental Protection (MassDEP) Massachusetts Military Reservation (MMR) group has discussed the team merger and concluded that the RAB would be an appropriate name for the PCT/IART team only when meeting with the Senior Management Board (SMB), since RAB membership generally includes elected officials. She said that a RAB would be more conclusive, to include the SMB. Mr. Field acknowledged Ms. Grillo's comment and told the team that a new name will probably be decided by the next meeting.

Meeting Topics and Schedules

Mr. Field reported that Installation Restoration Program (IRP) topics for the June 2008 PCT/IART meeting are scheduled to include: Landfill 1 (LF-1)/Chemical Spill 23 (CS-23) update, a presentation on the CS-10 Feasibility Study (FS), and an Ashumet Valley Plume update. He then asked if the Impact Area Groundwater Study Program (IAGWSP) had any ideas for the June meeting agenda. Mr. Gonser mentioned an update on the robotics technology and a Remediation & Investigation Update. Mr. Field added that IAGWSP topics noted for the July meeting are: Former B & D Ranges, Northwest Corner Remedy Selection Plan, Western Boundary, and perhaps a Leaching Studies Update. He also said that the team would take a break from meeting in August, resume meeting in September, and depending on the number of agenda topics maybe start meeting every other month. Mr. Field then asked the team members to introduce themselves, which they did.

Agenda Item #3. Impact Area Groundwater Study Program Remediation & Investigation Updates

Juliet & Kilo Small Arms Ranges Investigation Results

Mr. Gregson stated that in support of the Massachusetts Army National Guard's (the Guard's) effort to return to firing lead ammunition at some of the Small Arms Ranges (SARs), the IAGWSP is conducting soil and groundwater investigations of Juliet & Kilo Ranges, which are located in the south-central part of the base. He reminded the group that last year the Guard resumed firing lead at Tango Range using the STAPP bullet catcher system, and now is looking to do the same at Juliet & Kilo Ranges.

Mr. Gregson noted that the five rounds of data from the four groundwater monitoring wells installed at Juliet & Kilo Ranges in early 2007 have shown no detections of contamination. He also showed an aerial photograph of the ranges and pointed out the firing lines, the target lines, and the earthen berms that were designed to catch bullets fired downrange. He then showed the SAR conceptual site model and explained that bullets are fired downrange at targets held in frames in front of the berm. He noted that potential sources of contamination are: the firing points (airborne particles – propellants and some metals – in gun smoke), the range floor (where airborne propellants and metals can also be found, but at somewhat lower concentrations than at the firing points), and the berm itself (metallic compounds, the bullets themselves, or bullet fragments containing primarily lead and copper, and during a certain timeframe, tungsten). Mr. Gregson said that once the compounds are deposited through firing, they can be rained on, dissolved to some extent, and leached into the soil. It's also possible that

soldiers or workers could have direct contact with the compounds that lay on top of the soil. The IAGWSP has taken soil samples to evaluate the extent of contamination. And in order to validate the conceptual site model the IAGWSP has used lysimeters at some of the SARs to collect pore water samples to determine how the compound is adsorbing and moving through the surface. Monitoring wells have also been installed. Mr. Gregson noted that the conceptual site model shows how the monitoring wells tap into the water table to see if any compounds are leaching to the subsurface, getting through the unsaturated zone to the water table, and intercepting the sampling point.

Mr. Gregson then reported that for the soil sampling a multi-increment sampling approach was used, with the range divided into segments, or decision units, from which composite samples were collected, ground up, (and a sub-sample collected), and analyzed – resulting in average concentrations of contaminants of concern (COCs) at each of the sampling areas. Juliet Range had seven multi-point sampling areas, and Kilo Range had twelve, based on the types of activities and levels of contaminants expected to be seen in each decision unit. Samples from the range floor and firing points were analyzed for propellants (potential COCs such as nitroglycerin and 2,4-DNT), and samples from the entire range were analyzed for metals, including lead, antimony, chromium, copper, arsenic, and tungsten. Mr. Gregson stated that the compound causing the most concern at this time is nitroglycerin, as it's being found at higher concentrations and right now it's not fully understood how it leaches to groundwater. He also noted, however, that nitroglycerin has not been detected in any monitoring wells. He then reported that Juliet Range soil findings include a nitroglycerin detection of 43 parts per million (ppm) at the firing line, and slightly higher levels on the range floor than were seen at Tango Range, which led to dividing up the study area into smaller parts for additional sampling.

Mr. Field asked if there's a standard guideline for nitroglycerin in terms of concentration. Mr. Gregson replied that there is not, but noted that the IAGWSP had come up with a cleanup number for Tango Range, based on Kd values, which was around 5 ppm, depending on the size of the area. Mr. Goddard inquired about MassDEP's position on this matter. Mr. Pinaud replied by explaining that the SARs are treated somewhat differently because the Guard plans to continue to fire there, and so there will be a continual deposition. He said that the Guard can do a risk assessment to determine risk, but toxicological data are needed. He also noted that the main concern is the potential to leach to groundwater, not the risk to surface soil.

Ms. Jennings clarified that although there is a groundwater standard for nitroglycerin, it's necessary to back-calculate to determine what's safe in soil to leach to groundwater. She explained that there are values in the literature to help make the calculation from soil to groundwater, but those values are in question since higher concentrations than the 5 ppm Mr. Gregson mentioned were detected in soil, but nitroglycerin still has not been detected in groundwater. She also noted that the decision was made to move forward with the 5 ppm number for Tango Range so that the Guard could do the necessary cleanup and resume firing there. For Juliet & Kilo Ranges, however, the Army is conducting some additional studies to determine what might be the appropriate number to apply there, given the site-specific conditions. Mr. Pinaud added that the back-calculation number is just protective of groundwater. Mr. Cambareri inquired about the groundwater number, and Ms. Jennings replied that she believes it is 5 parts per billion (ppb), for Tango Range.

Mr. Gregson continued with his presentation by confirming that the IAGWSP is finding nitroglycerin levels at Juliet Range that are clearly above the standard established for Tango Range. He also said that lead levels at Juliet Range are similar to those detected at Tango Range, which were found not to be a threat to groundwater. He also mentioned that the berms at Juliet & Kilo Ranges were part of the Guard's 1999 berm maintenance/lead removal project as well as the tungsten removal effort that came later – therefore, these berms are relatively metal-free at this time.

Mr. Gregson also reviewed Kilo Range soil findings, which he described as similar to the Juliet Range findings. He noted that the highest nitroglycerin concentrations were found at the firing line, as high as 70 ppm, with lower levels found at the range floor. Metals, including lead, copper, antimony, and tungsten, were found at levels similar to what was found at Juliet & Tango Ranges. Mr. Gregson also noted that the Juliet & Kilo Range investigations are being documented in two separate reports. The Juliet Range draft report went to the regulatory agencies for review on April 29, 2008, and the Kilo Range draft report is being sent out tomorrow. He said that the review of the reports and the information contained in them will be used by the regulators and the Guard to develop a final approach and agreement on returning to firing at the ranges.

Mr. Pinaud said that according to the schedule he has, a 14-day informal public comment period on the Juliet Range investigation report began yesterday, and a public comment period on the K Range investigation report is slated for May 24 through June 6, 2008. Ms. Richardson noted that both of the reports will be available on the Environmental & Readiness Center (E&RC) website. Ms. Grillo asked Ms. Richardson to ensure that a notice of the public comment periods is published in the local newspapers, as the schedule indicates that that should have happened, but it didn't.

Mr. Goddard asked if it's correct that tungsten is no longer being detected in soil. Mr. Gregson replied that at Juliet & Kilo Ranges tungsten was detected in the 10 to 50 ppm range, which is consistent with the Guard's target cleanup level of 150 ppm for the tungsten-contaminated soil removal effort. He also said that tungsten leaching studies are currently being conducted in order to determine the soil number that would not impact groundwater – similar to the nitroglycerin leaching studies. Mr. Goddard questioned whether there might be some tungsten that's moved deeper into the soil toward the groundwater. Mr. Gregson acknowledged that possibility, but noted that during the soil removal the highest concentrations were found in the shallow surface soil. He also said that concentrations below the 150 ppm target cleanup level remained in the soil, and the question now is whether or not that's a concern, which is why the leaching studies are being conducted. Mr. Pinaud added that the excavation at the berms was a short-term measure to remove the bulk of tungsten contamination, so it's likely that more tungsten remains there. He also said that both MassDEP and the IAGWSP are testing groundwater across the SARs and haven't found tungsten in any of the monitoring wells, with the exception of one, at Bravo Range. He also said that he thinks that the leaching studies that are being performed will help determine the ultimate cleanup number.

Mr. Davis asked if anything has been learned from other (non-military) shooting ranges on Cape Cod, whether MassDEP requires sampling there, if similar levels are being seen, and what the groundwater situation might be. Mr. Pinaud replied that the state has a program called the "Lead Shot Initiative," which is doing work at a number of ranges in the state, some which do have problems with lead in particular. Those ranges are being cleaned up and best management practices (BMPs) are being instituted. Mr. Davis clarified that he was asking about issues with propellants, and Mr. Pinaud replied that he doesn't know about that, but will look into obtaining an answer.

Mr. Cambareri referred to the nitroglycerin detections at the ranges and asked when they were last used. Mr. Gregson replied that Juliet & Kilo Ranges were used right up until firing of tungsten ammunition was halted, sometime in 2006. He also said that it seems that the nitroglycerin is "hanging around" the surface soil, as the deeper samples (from 9 to 12 inches as opposed to 0 to 3 inches) showed much lower levels of nitroglycerin. Mr. Gonser added that this is one of the reasons for conducting the leaching studies. He explained that normal modeling would indicate that the nitroglycerin would be out of the soil and into the groundwater by now – but instead it is being found in soil and not in groundwater.

Mr. Pierce stated that Alfred Nobel found that dilute nitroglycerin is quite stable, and only when concentrated enough to support a chain reaction does it "go kaboom." He said that it's not a surprise to him, as a chemist, that the nitroglycerin is "hanging around the surface."

Mr. Dow noted that he received a document in the mail yesterday from the Guard in which he read that antimony and chromium concentrations exceeded some of the "level 1, 2, and 3 standards" at one of the ranges, although he doesn't recall which range. He then asked if there are standards for these metals and "where actually this comes from when you use the range." Mr. Gregson replied that he does not have the answers to these questions, but will take them back as an action item.

Mr. Dow then said that it's his understanding that the Guard wants to put STAPP systems on the Juliet & Kilo Range berms. Mr. Gregson confirmed that this is correct. Mr. Dow then inquired about the source of water that's been accumulating in the Tango Range STAPP system, which is presumably sealed. Mr. Gonser agreed that this has been a problem for some time, but noted that improvements have been made that have lessened the problem considerably. He explained that originally the seams weren't sealed properly, and the berm was built up over the STAPP system. The configuration at the top of the STAPP system has since been changed, and the problem with the seams has been addressed. However, some water does still get in the system, but it is pumped out routinely. He also said that although most of the problem has been resolved, the Guard is still looking at a few more things.

Ms. Jennings told Mr. Dow that the U.S. Environmental Protection Agency (EPA) contractor had provided similar comments about antimony and chromium, but with respect to the tungsten report. She said that she

expects that issue to be addressed once the SAR Working Group gets back to discussing the tungsten study and the need for further studies. She also noted that the regulators recently received the Tango Range Interim Report, which includes information about the water collection issue, and that report will be released to the public soon, as will documents on the Juliet & Kilo Ranges operations & maintenance plans. She also confirmed that, as Mr. Gonser indicated, although the water problem still exists, the magnitude of the problem is not what it once was, but it continues to be addressed.

Mr. Dow also inquired about the soil pH in the samples from the range. Ms. Jennings noted that this is tied to the antimony and chromium issue that EPA's contractor raised, with the contractor suggesting that the pH wasn't consistent with natural background and may be contributing to what's being seen in soil. She also said that she'd be happy to release to Mr. Dow EPA's contractor's comments on the tungsten report. Mr. Dow indicated that he would like to receive those comments, and noted that one of the BMPs being considered for Juliet & Kilo Ranges was the application of limestone granules to keep the pH higher and reduce the transport of heavy metals, including lead. Ms. Jennings said that the regulators and the IAGWSP will soon be discussing the results of the tungsten study conducted by the Army Environmental Command (AEC) and she suggested that providing an overview of the results and suggestions for future work at an upcoming PCT/IART meeting. She further noted that although EPA was asking the contractor to look at whether or not tungsten is mobile, the contractor's bigger concern had to do with antimony and chromium.

Mr. Dow asked if all of the studies and reports will be vetted and approved before July 2008, the Guard's proposed date for resuming training at Juliet & Kilo Ranges. Ms. Jennings replied that there's a fairly detailed schedule for rolling out Juliet & Kilo Ranges, much of which involves obtaining informal comments on the documents (the Juliet Range Investigation Report, the Kilo Range Investigation Report, the Operation, Monitoring, and Maintenance Plan [OMMP], and documents on berm construction and the STAPP systems). She also noted that before EPA issues its final position on the ranges, it will conduct its own formal comment period and provide responses. Ms. Jennings explained that EPA needs a collection of documents in its possession to evaluate before publicizing its position, but some of them are still being generated at this time. She then encouraged Mr. Dow to visit the E&RC website as all documents available for public review are posted there. Mr. Dow noted that one of the Sierra Club's comments during the Tango Range process was that not all of the documents were in place before training resumed, and the Sierra Club believed that they should have been.

Mr. Pinaud made a point of informing the group that the MMR's Environmental Management Commission (EMC) is the agency – on behalf of the state Executive Office of Energy & Environmental Affairs (EOEEA) – that provides approval for the ranges – not MassDEP. He noted that MassDEP participates in the process as a technical advisor, reviewing the documents and providing comments that are shared with team members.

Ms. Jennings told Mr. Dow that the Sierra Club's comment about the lack of a "reasonable comment period" on the Tango Range documents was heard, and consequently comment periods were "definitely" built into the Juliet & Kilo Range schedule. She also mentioned again that some of the Juliet & Kilo Range documents are currently out for informal comment periods, and urged Mr. Dow to take advantage of that.

Fate & Transport Studies Update

Mr. Gregson stated that fate & transport studies have been undertaken to try to understand why the propellant compounds nitroglycerin and 2,4-DNT, which have been used at the base for 50 to 70 years, are being detected in soil but not in groundwater. He explained that the propellant compounds are released as very fine, smoke-size particles and deposited on the ground as a solid; then rainwater falls and some portion of the compounds leaches out into the soil and either adsorbs onto the soil particles or is attacked by microbes and biodegraded. He then reviewed the questions that the fate & transport studies are trying to answer: Why aren't nitroglycerin and 2,4-DNT being seen in groundwater? What levels in soil would result in groundwater contamination above risk-based levels? If nitroglycerin and 2,4-DNT will get to groundwater, how long will it take?

Mr. Gregson reported that phase 1 of the lab experiments, the batch tests, were designed to determine the sorption/desorption rate of nitroglycerin and 2,4-DNT in Camp Edwards' soil. He then noted that the propellants typically used at the SARs are primarily nitrocellulose, which is about 10% nitroglycerine, and he said that 2,4-DNT is sometimes added to propellants used at the SARs. Mr. Gregson also mentioned that laboratory-grade nitroglycerin dissolved in water was used in the batch experiments to see how it would react in soil.

Mr. Gregson began reviewing the initial findings of phase 1 of the fate & transport studies by noting that some of the nitroglycerin and 2,4-DNT does sorb onto the soil, and some appears to be irreversibly bound. He also said that because reagent-grade nitroglycerin is used for the batch experiments, it helps with the modeling in terms of what happens after nitroglycerin dissolves and goes into solution, but doesn't answer the question of how quickly it dissolves from a solid and what happens with biodegradation. Mr. Gregson also reviewed the following batch test findings: the Kd values (a measurement of sorption to the soil) vary with depth due to changes in organic content and the mineralogy of the soil, with the compounds better bound in shallower soil where there's more organic matter; tests conducted on unfired propellant versus laboratory-grade material indicate that the dissolution part of the puzzle is very important, while adsorption/desorption may be less important; weathered nitroglycerin and 2,4-DNT in the soil appears to be irreversibly bound, in tests conducted both with and without a biocide; and biodegradation may play an important role in causing any dissolved nitroglycerin and 2,4-DNT present in the soil to be destroyed, and thereby preventing its migration.

Mr. Gregson then reported that phase 2 of the fate & transport studies includes soil column tests to measure the rate at which contaminants make it through the columns. These tests are ongoing and should be completed this summer. In addition, a rate-of-release study is being undertaken, which is a dissolution test conducted with fresh-fired nitroglycerin to determine how quickly propellants are released from nitrocellulose. Results from this part of the study are expected to be available in October.

Mr. Goddard asked whether reactive wall technology or enhanced monitored natural attenuation (MNA) might be considered to deal with the SARs contamination. Mr. Gregson replied that the hope is that "this horse hasn't gotten that far out of the barn yet" and then explained that the nitroglycerin that's being seen is still in very shallow soil (less than 1 foot) and the idea is to try to understand how it behaves and catch it before it goes any farther, if indeed that's what it's going to do.

Mr. Cambareri asked Mr. Gregson to put the nitroglycerin/2,4-DNT issue in context, in terms of a base-wide issue. He also mentioned that RDX, HMX, and perchlorate have been found in significant concentrations. Mr. Gregson replied that there have been a few detections of 2.4-DNT, but mostly at Demolition Area 1, which is a different kind of situation. He also said that relatively high concentrations have been seen in soil at the gun and mortar positions, some above the state's method 1 standard for 2,4-DNT, which is 700 ppb. He further noted, however, that 2,4-DNT has not been found in groundwater at the gun positions. Mr. Gregson also reported that nitroglycerin in groundwater is even more rare, with a data-base check revealing only two detections (of which he is suspect) in about 17,000 groundwater samples analyzed for nitroglycerin. He then noted that nitroglycerin probably could be expected to be found in soil at just about any of the SARs – the question is how much is a future risk to groundwater, but there doesn't appear to be a current risk.

Mr. Dow asked if the columns include the micro-fauna that live in the soil. Mr. Gregson replied that both sterilized and un-sterilized soil columns are being used for the testing. Mr. Dow stated that earthworms and other soil micro-fauna eat their way through the soil, and in the process make many things that are normally insoluble much more soluble and biodegradable by the bacteria. He then said that something to consider is that although it's possible that the propellant compounds are being biodegraded before reaching the groundwater, the point might be reached where the soil organisms are liberating more of the contaminants than the bacteria can handle.

J-2 East Treatment System Construction

Mr. Gregson showed a map of the J-2 Range area and pointed the J-2 East plume, the eastern base boundary with the Forestdale neighborhood of Sandwich, Route 130, and Snake Pond. He also noted that the IAGWSP installed a treatment system at the J-2 North plume, which was a priority, given that the plume is directly upgradient of Upper Cape Water Cooperative supply wells, particularly water supply well #2. He reported that the J-2 North system is pumping at 375 gallons per minute (gpm) to treat the RDX and perchlorate contamination, and is made up of three extraction wells, a treatment building, and two modular treatment units (MTUs).

Mr. Gregson then stated that the source of the J-2 East plume, an area of groundwater contamination containing both RDX and perchlorate, is testing and disposal activities that occurred at the J-2 Range, which was used by defense contractors for testing of munitions. He also noted that, as part of the base-wide unexploded ordnance (UXO) assessment program, the IAGWSP is looking at possible contribution of UXO remaining on the range to the groundwater plumes. He further noted that in 2004 the IAGWSP performed a series of soil removal actions at the J-2 Range to remove the known sources; that effort involved the excavation of about 8,400 tons of soil.

Mr. Gregson then displayed a map depicting the J-2 East system layout, noting that it will include two MTUs in the middle of the plume, two MTUs at the toe of the plume, three infiltration trenches, three extraction wells down the center of the plume, and the associated piping. Mr. Goddard asked Mr. Gregson to point out the direction of groundwater flow, which he did, noting that on that side of the groundwater mound the water is heading north.

Mr. Gregson then showed frame 1 of a modeling animation, apologized that he had been unable to capture the technology on his laptop for tonight's meeting, but assured the group that he would have the full animation at the next meeting. He also noted, however, that the model shows that the J-2 North and J-2 East treatment systems are designed to reach cleanup levels in about 14 to 16 years. He then showed several photographs of J-2 East system construction activities and noted that anticipated startup date of the system is September 2008.

Mr. Cambareri inquired about the pumping rate, and Mr. Gregson replied that the total pumping rate of the three extraction wells will be 425 gpm.

Mr. Bostwick remarked on the puzzling shape of the plume, which appears to be coming to a head rather than spreading out as it travels farther from the source area. Mr. Gregson explained that the shape of the plume is affected by its being in a fairly complicated area that includes a number of other plumes and several source areas, some of which are depleted, and a complex groundwater flow pattern. Mr. Gonser added that unlike the IRP plumes, the plumes that the IAGWSP is addressing are different in that many of them have had "varying sources over varying times" rather than a one-time release such as a pipeline break. He also mentioned the plumes' location at the top of the groundwater mound, which might have moved a little bit over time.

Mr. Goddard inquired about the color-coding on the map. Mr. Gregson replied that pink represents perchlorate, tan represents RDX, and the shaded areas represent both perchlorate and RDX. Mr. Goddard asked if there are any private wells in the neighborhood toward which the perchlorate is heading. Mr. Gregson replied that all of the residences in that area are on town water and there are no private wells there. He also noted that the contamination will dissipate as it heads north toward the extraction well. Ms. Jennings added that the capture zone of the well "extends over that area."

Mr. Dow asked if the perchlorate and RDX plumes occupy the same depth zones as the extraction well screens. Mr. Gregson confirmed that the screens are placed in order to capture the full vertical thickness of both the RDX and perchlorate plumes.

Agenda Item #4. Robotics Technology Demonstration

Mr. Gallagher said that a distinction between the IRP and IAGWSP is that there are UXO on many of the ranges where the IAGWSP is conducting work, and the UXO must be addressed before an action can be taken. He then stated that earlier this year the IAGWSP partnered with the Air Force Research Laboratories (AFRL) Robotics Group to conduct a technology demonstration that looks at whether robotic equipment could be used to clear UXO in a safe, efficient, and cost-effective manner. The demonstration, which originally was to take place just at the former L Range, was expanded to include other areas once the IAGWSP became aware of the many different types of tools and applications that were available.

Mr. Gallagher then showed a slide listing the various robotics projects: L Range – clearance of 40-mm grenades; Central Impact Area – clearance of munitions in an area up to 10 acres in size; former A Range – clearance of munitions from upper and lower target berms; former K Range – vegetation clearance of 15-foot wide swath for potential future UXO density evaluations and as a firebreak for future controlled burns; J-1 Range – clearance of four target berms; and firebreaks for controlled burns in the Southeast Ranges.

Mr. Gallagher showed photographs of some of the tools that were or will be used in the robotics projects: an All-Purpose Remote Transport System (ARTS), which can be used with several different attachments; a piece of equipment known as the AMRAD system, used to conduct EM-61 geophysical surveys of the ranges; a fully automated excavator and rotary sifter bucket; and an electromagnet that will be used to try to remove surface and subsurface metal from the Central Impact Area.

Mr. Gallagher then described the robotics technology demonstration conducted at L Range: targets were removed using the remotely-operated excavator with bucket and thumb attachment and transported to the front of the range where they were inspected for the potential for UXO and taken away to a staging area; the vegetation was flush

cut using the ARTS with a brush-cutter attachment, which did, however, leave the roots in place; an EM-61 survey was performed using the AMRAD tow vehicle and multiple sensor array (MSA) over eight acres cleared of vegetation, providing a superior geophysical survey; and UXO clearance was performed using the ARTS with a power rake and/or rototiller attachment and with the Cherrington Beach Cleaner attachment. Mr. Gallagher showed the geophysical survey map, noting the colors representing varying signal strengths that indicate the amount of metal present, whether surface or subsurface. He also showed photographs of the rototiller, surf rake, and Cherrington Beach Cleaner attachments. He said that the surf rake pulls up root balls that go into a hopper and later are inspected by explosives ordnance disposal (EOD) technicians for the presence of UXO. He also noted that the beach cleaner is used to dig into the subsurface (up to a depth of six inches at L Range) and the finer material is sifted back to the ground surface while the larger material is retained in a hopper and later inspected by EOD technicians for the presence of UXO. Any UXO that are identified are carried by the ARTS system to a central location where they will be destroyed. Mr. Gallagher also reported that another EM-61 survey of L Range will be performed in order to confirm the effectiveness of the removal action.

Mr. Gallagher then noted that at the J-1 Range, the vegetation is being flush cut using the ARTS system and UXO are being removed from the berms using the excavator equipped with the rotary sifter bucket. He also showed a photograph of the four berms at the J-1 Range (a 150-meter berm, a 1,000-meter berm, and two 2,000-meter berms) after they were excavated with the rotary sifter bucket, and noted that the 150-meter berm is almost down to ground surface.

Mr. Gallagher reviewed the preliminary observations of the robotics demonstration: the robotics have generally worked as expected (although wet soil at L Range affected the schedule as it's difficult to sift materials from saturated soil); use of robotics reduces time and manpower; it reduces worker exposure and increases safety; it can be done in a variety of weather conditions, including snow; and the technology is somewhat limited by line of sight, with a direct line of sight needed between the control unit and the piece of equipment that's being controlled.

Mr. Gallagher the noted that the next steps are: to conduct clearance studies at other ranges with different conditions, terrain, and vegetation; to test additional equipment, including the electromagnet at the Central Impact Area; and to determine the potential for wide-spread use of robotics technology in range operations & maintenance and munitions response. Mr. Gallagher then stated that potential uses include vegetation clearance, geophysical surveys, and the ultimate goal of UXO removal.

Mr. Goddard asked if the AMRAD system marks an anomaly with a global positioning system (GPS) marker when it finds one so that it's possible to go back to that exact location. Mr. Gallagher replied that the system is tied into a GPS unit, and therefore one could back to a specific location to dig up an anomaly. He also, noted, however, that the robotics tools work in a slightly different way in that they are designed to achieve full clearance of the range rather than having to have someone physically dig up the anomalies.

Mr. Goddard also inquired about the use of relay stations to alleviate the line of sight problem. Mr. Gallagher replied that some antennas were set up for relay stations. He also noted, for example, that on the J-1 Range berms it was necessary to bring one of them almost to grade in order to get a line of sight for the next one. He said that distance is not that important, but there has to be line of sight to operate the tools.

Mr. Bostwick asked if there had been any incidents or explosions. Mr. Gallagher replied that there have not been any at MMR. Mr. Bostwick also asked how tough the equipment is, should there be an incident. Mr. Gallagher replied that he doesn't think a 40-mm grenade going off would do much damage, but the potential for damage would be greater if a 150-mm projectile in the Central Impact Area should detonate. He further noted, however, that there seems to be little fear of accidental detonations, which he believes have occurred at other sites, since the idea behind using the robotics equipment is to avoid having human beings be the subject of potential detonations.

Agenda Item #5. Demolition Area 1 Systems Performance Update

At this time, Mr. Field reminded team members of the meeting evaluation forms in their packets, which they could use to provide suggestions or comments on the presentations. Mr. Gregson also encouraged team members to provide their comments on the presentations.

Mr. Gregson then stated that the Demolition Area 1 (Demo 1) plume, which is located south of the Impact Area, migrates to the west toward the base boundary with the town of Bourne. He also noted that the constituents in this relatively long and narrow plume are perchlorate and explosives (primarily RDX), and that the treatment system is made up of two separate treatment plants – one near the toe of the plume at Pew Road and the other in the middle of the plume at Frank Perkins Road.

Mr. Gregson stated that the source area is upgradient of the plume at the Demo 1 bowl. He reported that the Demo 1 site was used as an open burn/open detonation site to get rid of munitions and fireworks, and as a training site to teach engineers how to use explosives. The site is a natural kettle hole, about seven acres in size, and it was used from the 1970s until 1997. The COCs at Demo 1 were explosives, perchlorate, and propellants, and the IAGWSP conducted a Rapid Response Action (RRA) soil removal in 2004 and 2005 that involved the excavation of 28,000 tons (or about 1,000 truckloads) of soil, which was then treated in a low-temperature thermal desorption unit and later returned to the Demo 1 bowl and reseeded.

Mr. Gregson then noted that the Demo 1 plume is about 9,000 feet long, 1,000 feet wide, and 80 feet thick at the thickest part. The highest historical contaminant concentrations detected in the plume were 370 ppb for RDX and 500 ppb for perchlorate. The current maximum concentrations are 102 ppb for RDX and 135 ppb for perchlorate. He also mentioned that the state drinking water standard for perchlorate is 2 ppb, and the 10^{-6} risk level for RDX is 0.6 ppb.

Mr. Gregson explained that the first phase of Demo 1 groundwater treatment occurred in September 2004 with the installation of an RRA system consisting of four MTUs and two extraction wells to jumpstart treatment of the plume. In July 2007 the comprehensive treatment system for the Demo 1 plume began operating. Mr. Gregson noted that the Demo 1 plume is the first of the IAGWSP plumes to have gone through the remedy selection plan process and an issued decision document, which is comparable to a Record of Decision (ROD) for the IRP plumes. He also reported that about 950 million gallons of Demo 1 groundwater has been treated to date, at a current rate of about 1.3 million gallons per day.

Mr. Gregson displayed a figure showing the layout of the comprehensive system and pointed out the source area, the monitoring wells, the five extraction wells, the Frank Perkins Road treatment plant, the Pew Road MTU, and the four reinjection wells. The current pumping rate of the Demo 1 system is 911 gpm and performance monitoring for the first six months of operation showed the system to be functioning as expected.

Mr. Gregson then referred to the RRA system and noted that the 2007 Environmental & System Performance Monitoring Report covers the time period of mid-2006 to mid-2007 for both the Pew Road and Frank Perkins Road treatment plants. He also noted that the pumping rate at the Frank Perkins Road RRA system was 320 gpm, and that system included one extraction well, two reinjection wells, and three MTUs with a treatment train involving ion exchange resin to remove perchlorate and granular activated carbon (GAC) to remove explosives (primarily RDX). The Pew Road system consisted of one extraction well, one reinjection well, and one MTU. Although the treatment train at the Pew Road system started out with only GAC, in 2005 ion exchange resin was added because the levels of perchlorate warranted more aggressive treatment. Mr. Gregson also reported that when construction of the comprehensive system began in 2006, one of the extraction wells was installed early and piped into the RRA system, thereby increasing the overall flow rate to 430 gpm. An additional injection well was also installed at Pew Road at that time.

Mr. Gregson displayed a figure showing the layout of the RRA system, pointed out the various components, and also pointed out the three plume zones: the upgradient portion near the source area, the middle portion, and the downgradient portion near the toe of the plume. He also showed a figure that he described as a "cartoon" cross-section of the plume and noted that because perchlorate migrates a bit faster through the subsurface, the perchlorate part of the plume is out in front of the RDX part. He also displayed: several photographs of the MTUs and mentioned the advantage of being able to move the units to different sites as needed; line graphs depicting the volume of water treated over time at the Frank Perkins Road and Pew Road treatment plants; and a figure showing the capture zones based on the performance of the system.

Mr. Gregson then explained that the three aspects of system performance monitoring are hydraulic monitoring, treatment system sampling, and chemical monitoring. He noted that the hydraulic monitoring is showing a two to four foot drawdown of the water table at the Frank Perkins Road and Pew Road systems. He also reported that treatment system sampling shows that influent concentrations at Pew Road remain stable at about 11 to 13 ppb

for perchlorate and 0.7 to 1.3 ppb for RDX, with influent concentrations at Frank Perkins Road at about 10 ppb for perchlorate and about 4 ppb for RDX. Mr. Gregson stated that there's been no breakthrough in the ion exchange resin at either location, but GAC vessels have had to be replaced several times when breakthrough occurred there. He also reported that 46.2 pounds of perchlorate and 12 pounds of RDX were removed over the reporting period, and then showed a layout of the Frank Perkins Road treatment system (three MTUs) and described it as having six treatment trains running in parallel. Mr. Gregson displayed a graph showing influent concentrations at Frank Perkins Road over time. He continued by displaying a layout of the Pew Road treatment system, which he described as having two parallel treatment trains, as well as a graph showing influent concentrations there over time.

Mr. Gregson began discussing the chemical monitoring by noting that the monitoring network is made up of wells that are analyzed for explosives and perchlorate. He reported that concentrations in Zone 1 are generally decreasing, with some wells now nondetect for perchlorate. In Zone 2, monitoring well 210 (MW-210) saw an increase in concentration from 95 ppb to 243 ppb, indicating a slug of fairly high contamination moving through, but it should be captured by the downgradient extraction well. Mr. Gregson also noted that generally decreasing concentrations were seen in the wells along the sides of the plume, so it appears that it is narrowing in response to treatment. In Zone 3, near the toe of the plume, perchlorate concentrations increased in MW-225 from 11.3 ppb to 20.7 ppb, and there were no detections in the well to the south, also indicating the plume is narrowing in that area. Concentrations to the west remained below the detection limit, and RDX was detected in only one well in Zone 3 (MW-225) – at about 1.1 ppb. Mr. Gregson also showed cross-sections of the perchlorate and RDX contamination and pointed out how the extraction wells are affecting the plumes.

Mr. Gregson noted that some of the information collected as part of the performance monitoring is plugged back into the fate & transport model to determine the accuracy of predictions. He reported that there's a good correlation between the model and measured values for both extraction systems. Also, the hydraulic capture is as predicted and it appears to represent an accurate depiction of the aquifer conditions. Mr. Gregson then displayed a series of figures showing concentrations over time – at 2007 (startup conditions), 2012, 2017, 2022, and 2027, and mentioned the existence of a clay layer where the contaminant gets hung up and takes some time to dissipate. He also stated that based on the period of performance monitoring, no major changes are recommended.

Mr. Gregson then informed the group about a 0.6 ppb perchlorate detection in a well near the toe of the plume (MW-352) that occurred in December 2007, and noted that resampling of the well showed a 0.2 ppb detection. He said this has prompted the IAGWSP to begin thinking about the contingency remedy to prevent off-post migration. He noted that it appears that the 2 ppb contour is still quite a bit upgradient, but it's important to have a complete understanding of the area and carefully monitor the progress of the plume. Therefore, the IAGWSP has proposed a drive-point investigation to find out if the plume "is out there at all" and if it is, determine its depth so that some permanent monitoring points can be installed. Mr. Gregson further noted that the investigation will include putting in a staff gauge to monitor surface water levels and ensure that this has been adequately characterized in the model.

Mr. Goddard inquired about the travel time from MW-352 to the base boundary. Mr. Gregson replied that it is probably about 10 years. Mr. Goddard then said that he agrees with the idea of installing some drive-points "as far west as possible" and added that he thinks it's very important to keep the contamination from traveling off base. He also inquired about the location of Bourne Water District wells 2 and 5 in relation to the plume. Mr. Gregson pointed out the locations of wells 2 and 5, the Monument Beach wells, and another well that the Bourne Water District is considering, none of which are threatened by the Demo 1 plume.

Mr. Goddard then referred to the spike in the graph showing influent contaminant concentrations at Pew Road over time, which, as explained in the graph, was due to having just re-started the system after a four-day shutdown. He then asked if it's correct that the systems are in parallel series, and Mr. Gregson replied that it is. Mr. Goddard observed that there's no backup when the system is shut down for a media exchange, and questioned whether this is an issue of concern. Mr. Gonser explained that it is not because the groundwater moves at about one foot per day, which equates to only about four feet over a four-day period, and "so it just gets sucked right back" when the system restarts.

Mr. Cambareri inquired about the interaction of the plume with North Pond. Mr. Gregson replied that this is something that the IAGWSP is trying to determine. He also noted that although the pond is relatively shallow, the IAGWSP thinks that it does have some influence on groundwater flow and may be causing some upwelling of the

plume as it passes underneath the pond. He said that it's hoped that the drive-point and staff gauge information will help in better understanding that situation.

Ms. Jennings clarified for the group that because of disagreement among the regulators and the IAGWSP over the actual impact of the pond, a contingency was built into the Demo 1 decision document. She said that the IAGWSP's modeling had suggested that a lot of groundwater would discharge into the pond, thereby keeping contamination (if any) from reaching the base boundary. The regulators, however, didn't really think that the pond, given its depth, would have that much influence, and therefore were concerned about contamination traveling off base. Ms. Jennings then stated that the contingency in the Demo 1 decision document says that if any monitoring data, or any modeling based on monitoring data, suggest that contamination could migrate off base in the future, another extraction well would be installed to capture that leading edge. She also said that the thinks the contingency was an appropriate way to handle uncertainty. Mr. Cambareri noted that the impact of a potential extraction well on the pond would also have to be evaluated, and Ms. Jennings agreed.

Mr. Dow said that he noticed that 43% of the perchlorate has been captured, but only about 20% of the RDX has been. He also mentioned that RDX moves more slowly, then questioned whether the cleanup goals of 2 ppb for perchlorate and 0.6 ppb for RDX would be reached at the same time, or whether the system would have to keep running to complete cleanup of the RDX. Mr. Gregson replied that he believes the RDX will remain for a longer time simply because it's located primarily in the upgradient zone, Zone 1. He said that he thinks that the time it takes to get from the source to first extraction well drive the time of cleanup. Mr. Dow said that he's also concerned that the RDX that becomes trapped in low-conductivity clays and silts will prevent the possibility of being able to reach the cleanup goal in some kind of reasonable timeframe. Mr. Gregson said that it's likely that at some point the IAGWSP would be pumping clean water and would want to shut down the extraction wells and just monitor the degradation of the lower levels that are trapped in low-conductivity deposits.

Agenda Item #6. IRP Updates

PFSA Update

Mr. Davis stated that the Petroleum Fuel Storage Area (PFSA), one of the few remaining source areas that the IRP is still addressing, has been serving the base since the 1950s and continues to operate today. He also noted that two documented 2,000-gallon jet fuel spills occurred at the site in 1960s, and the site has been through a remedial investigation, ROD, and treatment system construction. The COCs identified in the ROD are ethylbenzene and total xylenes, and in October 2001 a soil vapor extraction (SVE) system began operating at the site to address the contamination. The system, which continues to operate today, has so far removed more than 640 pounds of fuel-related contaminants.

Mr. Davis then noted that when the PCT was last updated on the PFSA, one of the comments made had to do with the state's earlier decision to come up with different cleanup levels for extractable petroleum hydrocarbons (EPH) and volatile petroleum hydrocarbons (VPH) rather than looking at total petroleum hydrocarbons (TPH) as a whole. At the time some of the PCT members had commented that the IRP would not be able to close out the site without addressing EPH and VPH, which turned out to be true.

Mr. Davis then stated that SVE technology works very well in a situation like the PFSA's, where there's fuel contamination sitting fairly shallow in the aquifer, and the water table rises and falls such that a smear zone is created. He said that some of the contaminant will bind to the soil and some of it will sorb and desorb to the groundwater. He then explained that the SVE system pumps some air into the saturated zone and some air into the unsaturated zone, which releases the contaminants. Then the vapor is extracted and run through a vapor treatment unit, after which the clean air is discharged out of the treatment building. Mr. Davis then displayed a figure showing the SVE system layout and pointed out the base boundary, the Orenda Wildlife property, the vapor extraction wells, the sparging wells (which pump the air in), and the six zones of the system. He reported that the IRP has been monitoring the system for a number of years, and although the COCs are no longer being seen, some of the EPH contaminants are still showing exceedances.

Mr. Davis noted that the system was not able to remove these EPH contaminants. Therefore, the decision was made to rely on biodegradation, and the system has been switched to where it's just pumping in air to provide the oxygen for that biodegradation to occur. Mr. Davis said that the IRP will continue to monitor the system to ensure that the EPH levels continue to drop and anticipates that the system will have to run for another one to two years.

He also said that although EPH is not an original COC, the IRP will not be able to get state concurrence on cleanup if it hasn't been completely addressed.

Mr. Goddard asked if EPH would then become a COC. Mr. Davis replied that the decision document is not going to be modified.

Mr. Dow asked if any consideration had been given to trying to accelerate the biodegradation by adding sugars or some kind of easily biodegradable dissolved organic carbon. Mr. Davis noted that EPH concentrations are close to the required cleanup levels, and the plan is to try the lower-cost method of continuing to pump in air for the next eight to ten months, conduct some sampling events, and see if the concentrations drop. If no change is seen, however, the IRP will have to evaluate how to get rid of the remaining contamination.

Mr. Cambareri mentioned his familiarity with the concept of adding nitrate to further stimulate biodegradation. He also acknowledged that nitrate is a regulated compound, but said that chances are that they would be taken up in the treatment zone. Mr. Pinaud stated that MassDEP does have a permitting process for remedial additives, but doesn't see any problem with proceeding with the IRP's proposed method to see how that works.

FTA-2/LF-2 Update

Mr. Davis displayed a figure showing the Firefighter-Training Area 2 (FTA-2)/Landfill 2 (LF-2) site and pointed out the road that leads back to the 102nd Fighter Wing, the PFSA, Western Aquafarm, Storm Drain 5 (SD-5)/Fuel Spill 5 (FS-5), and FS-15. He also noted that the FTA-2/LF-2 site has undergone a full remedial investigation and a ROD has been issued.

Mr. Davis described the site as a fire-fighter training area that operated until 1956 and was built on top of an old 1940s military landfill (for domestic, demolition, and industrial waste). The ROD identified the COCs as ethyl benzene and total xylenes, and a biosparge/SVE system was installed and run from September 2001 until March 2003, removing more than 127 pounds of fuel-related contaminants. After, the system was moved to the SD-5 source area to address some perchloroethylene (PCE) contamination there, so the system is no longer at the site.

Mr. Davis then stated that some isolated areas of EPH contaminants remain in the groundwater at the site, but do not appear to be migrating. In addition, elevated levels of trimethylbenzene (TMB) have been identified at three locations. TMB does not have a cleanup standard and so the IRP has been doing a literature search to try to establish an acceptable cleanup value that would be protective, but perhaps higher than the risk-based TMB cleanup number used at FS-13, which was 17 ppb. Mr. Davis also mentioned that some other states as well as EPA's preliminary remediation goals (PRGs) are a bit higher than 17 ppb. He further noted that, as is the case with the PFSA, this site cannot be closed out yet even though the original COCs are gone. He also said that the IRP plans to propose a TMB cleanup value this summer, and is going to continue monitoring to ensure that levels continue to drop. If decreasing trends are not seen, however, augmentation of some kind will be considered in order to move the process along.

Mr. Lim made a point of informing the group that TMB is a non-carcinogenic risk compound.

Mr. Goddard asked if EPH would be added to the list of Superfund or Massachusetts Contingency Plan (MCP) COCs. Mr. Davis explained that the official list of COCs is developed during the remedial investigation of a site; it comes out of the risk assessment. Mr. Goddard explained that he's referring to future sites. Mr. Pinaud replied that the answer is yes, if EPA agrees. In other words, MassDEP would send a letter to EPA asking it to consider a cleanup standard, and then the agency would have to agree. Mr. Field said that he believes that there are no remaining IRP source areas other than those being discussed tonight. Mr. Davis clarified that the only other IRP source areas are the two in the Impact Area, CS-18 and CS-19, which are not fuel sites.

Mr. Dow inquired about the target against which risk was assessed for TMB, since it is not a carcinogen. Mr. Lim noted that he recalls an inhalation risk related to non-carcinogenicity, and Mr. Davis said that a conservative hazard index of 1 was used to assess risk. Mr. Dow inquired about eco-risk, and Ms. Jennings noted that the non-cancer hazard index is associated with human non-carcinogenic issues, not eco-risk. Mr. Davis said that he's not certain, but believes that an ecological risk assessment was conducted. Mr. Lim clarified that an ecological risk assessment for TMB was not conducted because it is subsurface TMB contamination and so the primary exposure pathway is a groundwater residential scenario. Mr. Davis added that the contamination is on base and not traveling to any surface water bodies.

CS-10 Update

Mr. Davis described the CS-10 plume as a large plume with multiple source areas for which a ROD has not yet been issued. He also noted, however, that since 1999 a number of interim remedial actions have been taken to pump and treat the plume. He then referred to a map of the plume and pointed out Ashumet Pond, Johns Pond, the base boundary, the In-Plume treatment system, the Sandwich Road treatment system, and the extraction well situated between Ashumet and Johns Ponds.

Mr. Davis then reported that the IRP has been concentrating on a portion of the plume known as the Southern Trench area, so called because of its location near the southern infiltration trench. He also said that the installation of an additional extraction well in the area to try to capture the Southern Trench contamination had not been successful; therefore the IRP is working on another remedial action to capture that contamination. He also noted that the IRP and the regulators have been in discussions about whether treatment is needed at the North-Central Lobe of the plume between Ashumet and Johns Pond.

Mr. Davis then said that although the CS-10 ROD has not yet been written, it will include a requirement to capture the Southern Trench lobe of contamination. He noted that the plan is to install an extraction well along Currier Road with a projected flow rate of 290 gpm. A pipeline will run from the well along Currier Road, up Sandwich Road, and then join with an existing pipeline that runs to the Sandwich Road Treatment Facility. A new reinjection well will also be installed on base next to the wastewater treatment plant.

Mr. Davis continued by discussing the North-Central Lobe of the CS-10 plume, noting that because the concentrations there are low and sporadic, the IRP doesn't think it poses any long-term threat. The regulators, however, still have some concerns about the North-Central Lobe and where it might end up on the eastern side of Johns Pond. He then noted that the IRP has agreed to gather additional data at two locations. He referred to the map and pointed out the two locations, noting that the purpose of the latter one is to obtain a screen elevation appropriate to monitor contamination that may be coming from underneath the pond. He further explained that drive-point work in that area a couple of years ago showed a 50 ppb detection in one elevation, but a well was not left behind. This time, however, the plan is to leave a well behind in order to see if there is widespread contamination in the North Central Lobe at levels that would be of concern.

Mr. Davis also mentioned that past residential well sampling events revealed some low-level contaminant detections, but below the drinking water standard. He noted that the IRP has always contended that those detections were from some local source as they occurred much shallower than if the plume had gone under Johns Pond. In addition, the U. S. Geological Survey (USGS) helped to validate that with isotope data showing that any shallow water being drawn into those residential wells was actually pond water. Mr. Davis further noted, however, that there's been some concern that Martha's Pond may be drawing up the groundwater. He then said that "this well" will serve a dual purpose, providing some vertical gradient elevations and filling a data gap where there's a fairly wide space between monitoring wells. He also noted that the new wells will in part act as sentry wells for a private water supply well for a trailer park in the area. He said that it's hoped that once the new data are available it will be possible to move forward with the CS-10 ROD.

Mr. Davis then reviewed next steps: award a construction contract for the Southern Trench area in July/August 2008; gather additional data at two locations and determine if the results aid in making a final remedy decision for the North Central Lobe; present the draft CS-10 Feasibility Study, which is currently out for regulator review, to the PCT/IART in June/July 2008; issue the CS-10 Proposed Plan in September/October 2008 and hold a 30-day public comment period; and issue a ROD in June/July 2009.

Mr. Bostwick inquired about the depth of the Southern Trench lobe as it approaches Ashumet Pond. Mr. Davis replied that it stays deep in that area, with the contamination not starting until about 180 to 200 feet below ground surface (bgs). Mr. Bostwick then asked about the depth of the new extraction well. Mr. Davis replied that it will be -90 to -150 feet mean sea level (msl). Mr. Bostwick asked if it's correct that the new extraction well won't have any effect on the pond. Mr. Davis confirmed that it won't, although it is very close to the pond, but past the hinge line. He also mentioned the phosphorus plume that's discharging into Ashumet Pond through a passive reactive barrier and noted that the effort was made to come up with a pumping scheme that wouldn't affect that flow path. He then noted that no ecological thresholds for drawdown in Ashumet Pond would be exceeded, and added that reinjection flow rates are being adjusted to help keep hydraulic balance in that area. Mr. Bostwick then

asked if there are any ongoing ecological studies of the pond. Mr. Davis replied that the only study that's happening there pertains to the trophic health of the pond, associated with the nutrient discharges.

Agenda Item #7. Brief Review of Meeting Format, Presentations, Content, Tour

Mr. Field asked if there were any comments from the team on tonight's meeting/presentations. Mr. Goddard said that he thinks the team merger is going to work out fine. He also said that he thinks team members could all benefit from the idea of beginning presentations with a briefing on acronyms, cleanup levels, and the like. He also requested that presenters use the base-wide plume map to help orient team members on site locations.

Agenda Item #8. Adjourn

Mr. Field said that base tours for IART/PCT members are anticipated to occur in mid June, with perhaps one tour on a Friday and another on a Saturday. The tours will probably last about three hours and will include a combination of background presentations and actual site visits. Mr. Field stated that the PCT/IART is scheduled to meet next on June 11, 2008 and then adjourned the meeting at 8:41 p.m.