Senior Management Board
Bourne Best Western
January 30, 2008
6:30 – 8:15 p.m.

Meeting Minutes

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Bob Mullennix	IART	508-759-8319	Robert.mullennix@verizon.net
Gerald Potamis	Town of Falmouth	508-485-7340	jpotamis@falmouthmass.us
David Dow	Sierra Club	508-540-7142	ddow@mercury.wh.whoi.edu
Nate Weeks	Stearns & Wheeler	508-790-1707	nweeks@stearnswheeler.com
Mark Hutson	Ellis Environmental	303-948-1417	mhutson@geo-hydro.com
Jane Shea Gasper	Innovar/e^2M	508-759-9114	jgasper@innovar-env.com

Handouts Distributed at Meeting:

1. Presentation handout: Remediation & Investigation Update
2. Presentation handout: Ashumet Valley Update
3. Presentation handout: Chemical Spill 10 Update
4. Presentation handout: Fuel Spill 28 Update
5. Presentation handout: Small Arms Ranges Update
6. Air Force Space Command fact sheet: Radio Frequency Radiation Safety
7. PAVE PAWS information sheet: ANSI/IEEE Standards – Typical Radio Frequency Emissions
8. Air Force Space Command statement re: MDPH Ewing's Sarcoma study
9. Information brochure: The 6th Space Warning Squadron Cape Cod Air Force Station

10. Information brochure: Cape Cod Air Force Station Environmental Program

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Agenda Item #1. Introductions, Approval of 9/26/07 SMB Meeting Minutes, and Agenda review

Mr. Green convened the meeting at 6:34 p.m. and the Senior Management Board (SMB) members introduced themselves, including Capt. Abel, the new U.S. Coast Guard (USCG) Air Station commander. Capt. Abel said that he wants to ensure that USCG personnel are scrupulous stewards of the environment, and also noted that as "mayor for the city of Otis" he is very interested in Osborne Pond's potential to be an asset for the base community. When Ms. Garcia-Serrano of the Massachusetts Department of Environmental Protection (MassDEP) introduced herself she also noted that MassDEP's Southeast Region has an upcoming meeting specific to Osborne Pond.

Mr. Green asked if there were any changes or additions to the September 26, 2007 SMB meeting minutes. No changes were offered and the minutes were approved as written.

Agenda Item #2. Late-Breaking News

Ms. Young, who represents the Secretary of the Massachusetts Executive Office of Energy & Environmental Affairs (EOEEA) as trustee for the Commonwealth's natural resources, announced that a Massachusetts Military Reservation (MMR) natural resource damages settlement had been reached with Textron Systems Corporation. She said that as noted in the October 2007 news release, the settlement was reached between state and federal trustees. On October the government filed a consent decree in U.S. District Court for natural resource damages, requiring Textron to pay $1 million to the Commonwealth and $300,000 to the federal trustees. The consent decree underwent a 120-day public comment period, which ended yesterday, and the next step is for the court to finalize the terms of the consent decree, which now requires that Textron make full payment within 30 days of the consent decree being entered in final format.

Ms. Young said that she could provide more detail about the natural resource damages law at the March SMB meeting, when she'll have more time on the agenda, but at this time she briefly explained that the purpose of the law is to compensate for the injury to natural resources due to releases of oil or hazardous substances. She further noted that in this case the Commonwealth asserted a claim for injury to groundwater and it's expected that the money will be used for restoration projects at MMR to address the groundwater injury.

Questions and Comments from SMB and Public

Ms. Valiela asked if the consent decree affects only the Textron sites at MMR. Ms Young replied that the decree addresses only the releases by Textron due to its operations at MMR. Ms. Valiela asked if the remaining sites are still part of the larger natural resource damages picture. Ms. Young confirmed that they have not yet been resolved. Ms. Valiela then asked if Ms. Young's presentation at the March SMB meeting would include information about the other sites. Ms. Young confirmed that she plans to provide a status update on pursuing natural resource damages site-wide.

Mr. Dow asked if the money from Textron would be applied only to Textron sites at the base or if it could be used for restoration throughout the base. Ms. Young replied that the money is to be used for restoration of groundwater at the Upper Cape – on and off MMR.

Agenda Item #3. MMR Community Team Update

Ms. Wadsworth announced that there will be a team review workshop involving citizen members of the SMB, the Impact Area Review Team (IART), and the Plume Cleanup Team (PCT), as well as representatives of the environmental regulatory agencies and military organizations. The purpose of the workshop, which will be facilitated by Patrick Field of the Consensus Building Institute (CBI), is to look at the MMR teams and have a discussion about how they're working. Ms. Wadsworth then noted that the recommended date for the event is March 26, 2008 – the same as the next scheduled SMB meeting – and the proposal is to have a brief SMB meeting (which includes Ms. Young's Natural Resource Damages presentation), to begin at 6:00 p.m. rather than 6:30 p.m., with the workshop to follow immediately thereafter. Ms. Wadsworth also mentioned that Mr. Field would notify everyone when the date for the team workshop has been definitively determined.

Questions and Comments from SMB and Public

Ms. Sanderson noted that part of what prompted having a workshop is waning team membership; therefore, on a parallel track with reviewing the overall team structure it can be expected that an effort will be made to solicit new team members (particularly citizens of Sandwich and Bourne for IART membership).

At this time Capt. Abel took the opportunity to report some late-breaking news that he'd forgotten to mention earlier. He noted that on October 1, 2008, as part of taking over management of the airport complex at the base, the USCG plans to discontinue using the existing fuel farm, which is a "huge facility," and begin working with a much smaller operation – an off-the-shelf portable tank that looks "kind of like a fuel truck without wheels." Capt. Abel also noted that an environmental assessment will be conducted to ensure that fuel storage and transfer are handled correctly, and all the stakeholders will be engaged to make certain that all of their questions are answered.

Agenda Item #4. Impact Area Groundwater Study Program Remediation & Investigation Update

J-2 East Treatment System

Mr. Gregson showed a map of MMR, pointed out the Southeast Ranges, and noted that the Impact Area Groundwater Study Program (IAGWSP) is in the process of constructing a groundwater treatment system to address perchlorate and RDX contamination coming from the eastern portion of the J-2 Range. He showed a layout of the system and said that well pad sites are currently being prepared and the construction of roadways for the drilling will begin next month. He further noted that the system will include three extraction wells along the center of the plume: one near the source area pumping at 90 gallons per minute (gpm), one in the middle pumping at 210 gpm, and one at the toe of the plume pumping at 125 gpm. The extracted water will be treated with activated carbon and ion exchange resin and then discharged to infiltration trenches along the sides of the plume near the toe. Mr. Gregson also reported that the J-2 East system is scheduled to be up and running by September 2008, and it, along with the system that's already in place, should run for about 14 to 16 years.

Small Arms Ranges Investigation

Mr. Gregson stated that the current focus of the IAGWSP work at the Small Arms Ranges (SARs) is on Juliet & Kilo Ranges, where the Massachusetts Army National Guard (the Guard) is looking next to resume training with lead ammunition. He then noted that the four groundwater monitoring wells at these ranges, which were installed about a year ago, have not shown any contamination. He also stated

that, as was done at Tango Range, the IAGWSP is conducting comprehensive soil investigations at Juliet & Kilo Ranges, sampling for propellants, metals, and volatile organic compounds (VOCs).

Mr. Gregson then showed an aerial photograph of Juliet Range and noted that for the purposes of the soil investigation it was broken out into the following sampling areas: the firing line, the target berm (where soil was previously removed as part of the lead berm maintenance project and the tungsten removal project), the area behind the berm, and the range floor. He then reported that results from last September's sampling event showed some concentrations that were similar to what was seen at Tango Range – at the firing line nitroglycerin was detected at about 40 parts per million (ppm), some lead was detected behind the berm and some lower concentrations of lead were detected at the berm face. Nitroglycerin was also detected at the range floor – and in response to that, that area was broken out into smaller sampling units and additional samples were collected there as well as behind the firing line. Mr. Gregson stated that relatively high levels of nitroglycerin were detected north of the firing line and just behind the firing line. He also mentioned that initial soil sampling results from Kilo Range are expected to be available within the next couple of weeks.

Mr. Gregson reminded the group that the Guard had conducted some excavation work at Tango Range to remove the nitroglycerin there before resuming firing. He also noted that about a year ago it was determined that the cleanup level for nitroglycerin needed to be better defined. Therefore, fate-and-transport studies (batch and column tests) that look at both nitroglycerin and 2,4-DNT are currently under way in order to understand how they behave in the soil at MMR and whether the allowable cleanup numbers should be changed. Mr. Gregson noted that the batch tests will be completed in a couple of weeks, with a report likely to be issued in early March, while the column test results are expected in the May timeframe.

Use of Working Dogs at MMR

Mr. Gregson reminded the group that explosives-detecting dogs from the 67th Engineering Detachment Canine in Fort Leonard Wood, Missouri were at MMR last summer, doing work at several gun positions and the J-2 Range Extension area. Since then the IAGWSP has investigated some of the locations where the dogs (which have been used overseas in Iraq and Afghanistan to detect mines and explosives) had "keyed-in." He also explained that the advantage of using the dogs is that they can detect explosives that are and are not associated with metal, whereas metal detectors cannot detect explosives not associated with metal and often do detect metal not associated with explosives. He said that the thought was that the dogs might be able to find explosives and propellants more effectively and prevent having to do some of the extensive geophysical work and "hand-digging up every magnetic anomaly."

Mr. Gregson displayed a figure that showed locations where the dogs keyed-in at Gun Position 6 (GP-6) and the IAGWSP subsequently did some digging. He then noted that the results of the digging illustrated that the dogs are very sensitive and can detect even minute quantities of explosives, having found a 556 cartridge with propellant, primer wrappers, expended primers, empty casings, grenade safety pins, safety wires, ammo can seals, packing materials for primers, assorted munitions debris, and remnants of a propellant bag. Mr. Gregson then said that one school of thought is that the dogs might be too sensitive, since the IAGWSP is essentially looking for big caches of buried munitions or other items that could be potential contamination sources to groundwater. He also noted, however, that it would be beneficial to use the dogs to see if they key in on geophysical anomalies identified by a magnetic survey; if the dogs don't detect anything, it can be assumed that the anomaly is buried scrap metal.

Mr. Gregson also displayed a figure that showed locations where the dogs keyed-in at the J-2 Range Extension area. He noted that the IAGWSP has investigated those locations that coincided with

magnetic anomalies and is in the process of looking at some magnetic anomalies that the dogs hadn't identified. Mr. Gregson stated that this work is expected to be completed in the next month, after which a report on the findings will be prepared.

Questions and Comments from SMB and Public

Ms. Valiela asked how long the dogs were at MMR. Mr. Gregson replied that there were at the base (working at three gun positions and the J-2 Range Extension area) for about seven to ten days. Ms. Valiela inquired about the number of dogs. Mr. Gregson replied a team of five dogs was used and added that precautions were taken not to overheat them and therefore they worked only in the morning. He also noted that use of the dogs is a good opportunity to obtain data about the base and is also a good training opportunity for the dog handlers and the dogs themselves.

Mr. Dow asked Mr. Gregson to discuss the difference between the batch and column tests for the nitroglycerin and 2,4-DNT fate-and-transport study. Mr. Gregson replied that a batch test involves taking a certain volume of soil and shaking it up with water containing contaminant, while a column test involves allowing water containing contaminant to run through a column of soil and then seeing what comes out the bottom.

Mr. Dow then said that he recalls Mr. Gregson having mentioned in the past that the nitroglycerin is attached to cellulose, making it non-mobile. He then asked if in the column tests it would be possible to look at potential microbial controls that would degrade cellulose, allowing the nitroglycerin to move more freely – rather than geochemical controls such as pH, redox potential, and temperature. Mr. Gregson replied that pure nitroglycerin is used in the studies. However, the IAGWSP is embarking on an effort to look at how nitroglycerin dissolves out of a propellant fiber deposited on the ground that contains both nitroglycerin and cellulose. He further noted that the study includes a component that will provide some initial information on the biodegradation of nitroglycerin.

Mr. Dow also asked how the mobility characteristics of 2,4-DNT compare to those of nitroglycerin. Mr. Gregson said that he thinks 2,4-DNT behaves about the same as nitroglycerin – both compounds seem to bind up fairly well in soil and haven't been detected in groundwater at the site. However, the IAGWSP wants to understand how they might move through soil in the future. Mr. Dow also inquired about the compounds adsorbing to the organic carbon in the soil, although the soil is mostly sandy here. Mr. Gregson replied, "Although there's not much, I think that is still a major controlling factor at these ranges."

Agenda Item #5. Installation Restoration Program Updates

Ashumet Valley Plume Update

Mr. Davis reminded the group that the Ashumet Valley plume, which is almost entirely off base, in the town of Falmouth, is a VOC plume that predominantly contains perchloroethylene (PCE), but does contain some trichloroethylene (TCE) as well. He also noted that last spring the Air Force Center for Engineering and the Environment (AFCEE) issued the Ashumet Valley Proposed Plan that put forth a remedy called Alternative 6, which involved leaving the interim system in place and allowing the remainder of the plume to attenuate naturally. The regulators disagreed with this remedy, however, and instead supported an option called Alternative 7, information about which was distributed with AFCEE's proposed plan. Alternative 7 includes two new extraction wells in the southern part of the plume, which would be piped back to an existing treatment plant.

Mr. Davis then noted that after reviewing the comments submitted during the public comment period on the Ashumet Valley Proposed Plan, which occurred in July and August of last summer, AFCEE and

the regulators still were unable to reach agreement on a remedy. Rather than go to dispute resolution, which is an option in the Federal Facility Agreement (FFA), AFCEE and the regulators met several weeks after the close of the public comment period and agreed to put a formal dispute on hold and try to work the issue harder at the local level. Mr. Davis noted that the group had also agreed to: put more attention on the public comments regarding alternative technologies; work with the Town of Falmouth with regard to its proposed wastewater treatment facility (in the area of the plume that's currently untreated); develop a focused feasibility study that looks at the part of the plume that's currently untreated; and attempt to reach agency consensus.

Mr. Davis stated that AFCEE has been gathering as many data as possible in the southern part of the plume, where the amount of data was quite sparse. The effort to close data gaps included sampling all existing monitoring well screens in the area (including U.S. Geological Survey [USGS] wells) and the installation of additional drive-points. The plan is to develop a new plume shell, use the new data to update the 2004 model, rerun Alternatives 6 and 7 using the updated model, design and run some new focused alternatives, and make a decision based on the new data.

Mr. Davis then showed a map entitled "Ashumet Valley Leading Edge PCE Contaminant Distribution and Key Monitoring Well Results," and noted that it shows where the plume was believed to be last summer, before new data were collected. He also pointed that the northernmost well on the figure, monitoring well 1223 (MW-1223), in 2004 had a PCE concentration of 52 ppb, but had a PCE concentration of 8.2 ppb in the August 2007 sampling, and USGS well 375055 in 2004 had a PCE concentration of 44.5 ppb, but tested nondetect in August 2007. He further noted, however, that USGS well 443140 had a 15 ppb PCE concentration in 2004 and a 34 ppb concentration in August 2007. Mr. Davis then referred to the more southern wells, in the Backus River area, noting that most of them showed relatively unvaried PCE results from 2004 to 2007 (17 ppb to 12 ppb and 12 ppb to 6 ppb and 31 ppb to 30 ppb), while one of the wells, MW-103 went from 28 ppb to 3.7 ppb. He also stated that the differences seen in the plume will help build the new plume shell.

Mr. Davis then showed a map entitled "Ashumet Valley Leading Edge PCE Contaminant Distribution and Direct-Push Drilling Results," noting that many of the drive-points were installed on the Falmouth Golf Course. He also mentioned that the problem with drive-point technology is the inability to reach very deep if the "formation starts to tighten up." He pointed out drive-point 215 (DP-215), along Carriage Shop Road, and noted that it tested nondetect for PCE at 35 to 100 feet below ground surface (bgs), below reporting limit (BRL) at 105 to 110 bgs, 12 ppb at 115 to 120 bgs, and BRL at 125 to 130 feet bgs, which is as deep as that drive-point would go. He also pointed out a drive-point on the golf course that had only one detection above the PCE maximum contaminant level (MCL), which is 5 ppb, and another drive-point on the golf course that had a PCE detection at 10 ppb in one sampling interval.

Mr. Davis then referred to a drive-point location south of the golf course (DP-221), and also pointed out a MassDEP site in that area known as the Five Star site, which is currently undergoing investigation. He noted that PCE was detected at 55 ppb at 110 to 115 feet bgs and at 48 ppb at 120 to 125 feet bgs in DP-221, with a BRL result at 130 to 135 feet bgs and nondetect at 140 to 174 bgs. He also said that this shows the plume to be about 10 to 15 feet thick in that area, which is important information in terms of determining an extraction rate. Mr. Davis also pointed out some other fairly deep drive-points where low concentrations were detected. He then noted that there'll be a discussion next Monday as to whether additional drive-points are needed south of the 55 ppb detection, and whether it's necessary to sample deeper in the aquifer.

Mr. Davis reported that AFCEE plans to develop the new plume shell this spring and then, using the newest data, answer the question of whether there's an option that includes active removal that's more cost-effective than Alternative 7 (which was estimated to cost $9 million to construct and operate). He

noted that some of the comments on the proposed plan were recommendations to use on-site treatment units, rather than construct a big treatment plant, and AFCEE staff are currently looking through the spare-parts yard to see if it would be possible to put together a treatment system that doesn't involve a "big design and everything fancy." He further noted that any treatment in the southern part of the plume would not have to operate over a long time period, and added that AFCEE is very interested in reaching concurrence and issuing a Record of Decision (ROD) in 2009. If the agencies are unable to reach concurrence, however, they will discuss the options.

Questions and Comments from SMB and Public

Ms. Sanderson thanked AFCEE for the work that was done to fill the data gap. She also said that after seeing the new data this evening she's encouraged that the contamination "does seem to be a very narrow band." She also said that she's cautiously optimistic that it will be possible to beat the proposed dates that Mr. Davis mentioned.

Ms. Valiela asked if it seems likely that the new plume shell will show that there's less contaminant mass than thought before. Mr. Davis replied that he has the sense that will be case. Ms. Valiela also remarked that it's fascinating to her that there's a concentration of about 50 ppb "at that point" and that the plume is "getting down to something that's only 20 feet thick and 50 feet wide." She also said that she finds it fascinating that each new batch of data seems to show the high concentrations to be farther east. Mr. Davis agreed that the higher concentrations seem to be staying to the east. He also noted that the flooded/unflooded cycles in the bogs affect the groundwater flow. He then reminded Ms. Valiela that MW-104 is one of the wells that is sometimes above and sometimes below the MCL. Ms. Valiela said that she considers levels near the MCL to be a "trace," but believes that levels in the 54-ppb range warrant further investigation/treatment downgradient. She then inquired about access along the road. Mr. Davis confirmed that AFCEE has been going along the road with the drive-point rig.

Ms. Valiela then mentioned the issue of the Town of Falmouth's plans for wastewater treatment/discharge, and noted that she thinks the town would prefer that any future plume treatment be as far south of the potential wastewater area as possible.

At this time Mr. Potamis, the Town of Falmouth's wastewater superintendent, introduced himself and Nate Weeks of Stearns & Wheeler. Mr. Potamis then thanked AFCEE, MassDEP, and EPA for their cooperation, for listening to the town's concerns, and for looking for a better solution. He also noted that Falmouth is moving ahead with its Comprehensive Wastewater Management Plan (CWMP) and is expecting the Massachusetts Environmental Policy Act (MEPA) Office of EOEEA to issue a certificate within the next day or two. He also noted that: the town received a grant from the Cape Cod Water Protection Collaborative to conduct additional particle tracking south of the potential Falmouth Country Club site; the Memorandum of Agreement (MOA) had been signed; and the contract with Stearns & Wheeler is nearly finalized. Mr. Potamis also noted that the town will be meeting with AFCEE and he is hopeful that data can be shared. Mr. Weeks added that Stearns & Wheeler has been working with the Town of Falmouth and is about to get started on some groundwater modeling of potential treated water recharge sites – particularly focusing on fate and transport of any nitrogen that might be in that treated water. He noted that, as is well known, nitrogen is causing eutrophication of the coastal estuaries to the south, which is a very big concern.

Ms. Garcia-Serrano remarked that she thinks it's admirable that AFCEE is looking into the possibility of building a treatment system out of spare parts. She then asked if any MILCON (Military Construction) challenges might arise in terms of siting additional active treatment. Mr. Davis clarified that MILCON is not an issue, as AFCEE's Installation Restoration Program (IRP) is funded by Defense Environmental Restoration Program (DERP) dollars.

Mr. Dow inquired about concentrations at the small area of contamination to the northwest in the leading edge figures (well USFW375055). Mr. Davis replied that that area was defined by a one-time PCE detection in 2004 of 44.5 ppb. He also said that the contamination that was detected there might be discharging into the river, and noted that some PCE has been seen in the upper bogs over the past three years. He also noted, however, that that contamination was not seen in downgradient monitoring wells. Mr. Dow then asked if it's correct that the other leading edge portions of the plume wouldn't be discharging to the bogs. Mr. Davis replied that one of the questions in the model pertained to if the particle tracks all bent toward the river in unflooded conditions whether that would create a smear zone "where things start to move and then go back down." He also noted that the first time PCE was seen in the river system was in summer 2004, when the USGS installed a number of drive-points and detected concentrations in the low 20s ppb range in groundwater before it emerged into the river system.

Mr. Dow also asked about the location of the discharge point for the potential Falmouth wastewater treatment plant. Mr. Weeks stated that Falmouth is looking at the entire golf course site, a town-owned property that could be used for wastewater management and recharge. He then referred to the map, pointed out three potential discharge sites, and noted that there are "three major watersheds that come up into this site." He also said that the plan is to collect the septic tank discharge that's flowing into the ground, treat it to a high level, and then recharge the water a little bit higher up in the watershed. He further noted that there's a desire to "distribute that recharge back into the watershed from whence it came," partly because "a large accounting" has to take place in order to meet the Total Maximum Daily Limit (TMDL) regulated by EPA and MassDEP. Mr. Weeks added that "if you collect it all from a large area, treat it to a high level, but then recharge it at the small concentrations that still remain in the treated water, you may still run into too much." Mr. Dow said that his concern is that the town discharge location doesn't steer the leading edges of the Ashumet Valley plume closer to the river, the wetlands, and the cranberries. Mr. Davis replied that AFCEE is also considering that dynamic. He further stated that AFCEE hopes to complete its remediation before the town begins its wastewater treatment activities.

Capt. Abel inquired about the possibility that the Five Start site is the source of the highest concentrations in the plume. Mr. Davis replied that that is not thought possible, based on groundwater flow and depth, which is a key indicator.

Ms. Garcia-Serrano told Mr. Dow that she recently learned through information provided by the Town of Falmouth that the aquifer that would be cleaned up is within a separate watershed than the potential treated wastewater injection area.

CS-10 Update

Mr. Davis showed a map of the Chemical Spill 10 (CS-10) plume and pointed out the Southern Trench area, located at an infiltration trench along the power lines. He explained that it was expected that the treatment system's southern infiltration trench would infiltrate enough water, in combination with the extraction, to keep the plume from crossing the base boundary, which it is, however, doing. He also pointed out a location across the base border where TCE was detected at 18 ppb in a December sampling event. Mr. Davis noted that AFCEE didn't have a lot of data from that area, and therefore, in 2006 and 2007, spent about $1.5 million on the collection of additional data to create an updated plume shell and better understand the Southern Trench area. He also reminded the group that about four years ago an additional extraction well (EW-11) was installed in that area. Mr. Davis stated that AFCEE is engaged in wellfield design to keep the contamination at the Southern Trench area from migrating farther, while simultaneously working toward a final ROD.

Mr. Davis then showed cross-section A-A', to illustrate the thickness of the plume. He pointed out the approximately 100 feet of clean water above the plume, the plume thickness of 70 to 80 feet, the base boundary, the portion of the plume being captured by upgradient extraction, and the portion of the plume that's currently not being captured. He also noted that contaminant concentrations at the base boundary are around 100 ppb, and pointed out the location of the 18-ppb detection.

Mr. Davis also reminded the group that the Southern Trench area is very complicated because of the nearby phosphorus plume that comes from the old wastewater treatment plant and discharges into Ashumet Pond, where AFCEE has installed a reactive barrier, and because of the nearby USGS national tracer test site, which could be comprised by changes to hydraulic gradients. He also mentioned an area that's being monitored for manganese and thallium from the old wastewater treatment plant area. Mr. Davis explained that because of these complications, and concerns about potential ecological impacts to Ashumet Pond, AFCEE has been spending a lot time evaluating the hydraulic gradients and coordinating with USGS before deciding what action to take.

Mr. Davis then showed an animation of what's considered the top candidate for treatment at the Southern Trench area, which AFCEE is going to start evaluating for the Feasibility Study (FS). He noted that the new extraction well at Currier Road would pipe back to an existing treatment plant, and that some of the reinjection wells would be moved to the other side of the plume to help flatten the gradient and prevent the phosphorus plume from being pushed away from the reactive barrier at Ashumet Pond.

Mr. Davis also showed a slide entitled "Next Steps on Road to ROD," which noted the following actions to be taken: conduct an FS on the new alternative with an extraction well at Currier Road; integrate that analysis with previously evaluated alternatives; present the selected alternative in a proposed plan in summer 2008; simultaneously refine the wellfield design for the new extraction well; award a construction contract in 2008 (pre-ROD) for the new extraction well; and issue a final ROD in late 2008/early 2009, depending on the length of the review process. Mr. Davis noted that the take-home message is that AFCEE wants to address the Southern Trench area ahead of the rest of the CS-10 decision, but also finalize the ROD by no later than next year.

FS-28 Update

Mr. Davis reminded the group that a final ROD for the Fuel Spill 28 (FS-28) plume has already been issued. He also noted that FS-28 is an ethylene dibromide (EDB) plume, and that EDB is a fuel additive, for which the MCL is 0.02 ppb. He showed a map of the plume, which he noted is detached from its source, is entirely in the town of Falmouth, and is being cut off by an extraction well just south of Hatchville Road. He also noted that the treatment system includes a shallow well-point system in the Coonamessett bogs and a new extraction well on Hidden Pond Way, just east of Round Pond. Mr. Davis then pointed out the small, narrow portion of the leading edge of the plume that's not being captured and is likely to end up discharging into Pond 14.

Mr. Davis then reported that the concentrations coming into the shallow well-point system have declined through the years, and over last September, October, and November, that influent was nondetect, as were the existing monitoring wells in the area, and the surface water monitoring locations (which have always been nondetect.) He also noted that there are about 200 shallow well-points (which go only about ten feet into the bog), many of which were shut down after the last system optimization. Given the lack of concentrations in the influent and the surface water, AFCEE proposed to shut down the remaining operating well-points, but also to take some closer surface water samples at two locations to ensure that no contamination was coming up into the bog, which was ready to be farmed again. The additional sampling was conducted two weeks after the well-points were shut down

in December, and the results were BRL detections of EDB at the two locations, indicating that there's some EDB still discharging into the surface water system. Therefore, the shallow well-points were started up again, and the surface water sampling that was done after that yielded nondetect EDB results, while the influent sampling showed small amounts of EDB again. Mr. Davis said that it's believed that the "last gasps" of contaminant are coming through, but AFCEE is being especially careful because of the cranberry situation. He noted that the shallow well-points will continue to run for the time being and sampling will be conducted again in the spring to see if the exact source of the EDB can be determined so that extraction can be focused there. Mr. Davis also said that it's hoped that next year at this time the shallow well-point system will have completed its work and the bog will be back in operation for Falmouth.

Mr. Davis then spoke about EW-2, the new well that was installed at the plume's leading edge that was discovered over the past two years. He showed cross-section E-E' and noted that EW-2 was installed as far south as possible, but because of access issues, a small portion of that part of the plume will go uncaptured and likely discharge into the Pond 14 river system. He also reported that EW-2 has been running for a couple of months and is showing good, strong influent concentrations. Mr. Davis also displayed a cross-section figure that showed "a real tight area of the plume coming at us out of the page" and noted that based on the hydraulic data, EW-2 is achieving good capture.

Mr. Davis also reported that AFCEE did a series of push-points below the pond bottom at Pond 14, all of which came back nondetect. He further noted that although it's believed that the uncaptured portion of the leading edge is discharging to Pond 14, the nondetect results indicate that the concentrations are very low and mixing with so much clean water that full dilution is occurring. AFCEE will continue to monitor, however, to ensure that the end of the plume is coming through the monitoring network.

Questions and Comments from SMB and Public

Mr. Dow asked how long it will take for the EDB that's trapped in the low-permeability layer (seen in cross-section E-E') to leach out and reach below MCL levels. Mr. Davis replied that this question is usually answered by the groundwater model, but this area is so complicated hydraulically that AFCEE doesn't have a groundwater model there. Based on available data, however, and a similar situation at the FS-12 plume, the predicted clean year for FS-28 is 2045. He also noted that much of the work that's ahead for the cleanup program will be looking to optimize existing remedial solutions and make them better so that life-cycle costs go down. Mr. Dow noted that he was recently asked in an interview how long it will take to complete the cleanup and answered that it depends on how the contamination that's trapped in impermeable layers leaches out. He added that the "how clean is clean?" issue was discussed, and he'd noted that that is difficult to decide, especially when the question has to be answered before it can be determined when the systems should be shut off. Mr. Davis agreed.

Agenda Item #6. Update on Ewing's Sarcoma PAVE PAWS Test Results

Ms. Steele noted that the SMB members were sent a copy of the Massachusetts Department of Public Health (MDPH) report on Ewing's Sarcoma and PAVE PAWS, which was released in December 2007. She also said that the Ewing's Sarcoma work came about during a public meeting in 2004 when MDPH released the results of an investigation of childhood cancer in the town of Sandwich. At that time a number of residents expressed concern about the incidence of Ewing's Sarcoma among children throughout Cape Cod, as well as concern about the potential that PAVE PAWS played a role in that incidence. Ms. Steele then explained that Ewing's Sarcoma is a family of tumors usually found in bone, but sometimes also in soft tissue, which can occur at any age, but most often in the teenage years.

Ms. Steele stated that MDPH's evaluation involved not only looking at the incidence of Ewing's Sarcoma on Cape Cod, but also doing some additional measurements of PAVE PAWS emissions in order to address those concerns. She also noted that the Cape-wide PAVE PAWS emissions measurements taken in 2004 were so-called average measurements, and one of the residents had suggested that peak or maximum measurements might be more meaningful. Ms. Steele also mentioned that the 2004 PAVE PAWS work was reviewed by the National Research Council (NRC), which concluded that there were no adverse health effects to the Cape Cod population as a whole resulting from the PAVE PAWS emissions levels measured at that time. The NRC also concluded, however, that it could not address potential emissions and health concerns at a much smaller geographical level, such as the individual level.

Ms. Steele then reported that for its recent investigation MDPH hired the same company that took measurements in 2004, Broadcast Signal Laboratory (BSL), to take peak power density level measurements at various locations around Cape Cod. She also noted that the incidence of Ewing's Sarcoma on Cape Cod during the most recent 10-year period available from the Massachusetts Cancer Registry (1995 to 2004) showed seven cases among children, when the expectation would have been two cases. The data related to PAVE PAWS at 31 different locations across Cape Cod showed that the measurements of the peak-pulse power densities at sites where individuals who were diagnosed with Ewing's Sarcoma either lived or frequented were very similar to comparison locations where there were no individuals diagnosed with Ewing's Sarcoma. In fact the average peak power density at comparison locations was a little bit higher than at those locations where individuals diagnosed with Ewing's Sarcoma lived.

Ms. Steele further noted that in addition MDPH reviewed the address at diagnosis for each of the individuals, and with one exception, there was no geographic clustering of the cases across Cape Cod. Two of the individuals did live close to each other, but were diagnosed about five years apart, and the PAVE PAWS emissions data taken at this time showed that levels at those locations were not in the highest quartile of measurements taken for this work. Ms. Steele also stated that the year of diagnosis was reviewed in order to see if there was any temporal clustering, and an unusual temporal cluster was seen where five individuals were diagnosed during the time period of 2003 to 2004. However, two of those individuals lived at their address at that time for less than one year and did not live on Cape Cod prior to that. In addition, for all of those individuals PAVE PAWS emissions levels were on the lower end of the total set of measurements that were taken.

Ms. Steele then stated that having looked at the total body of evidence in terms of the emissions levels (spatial and temporal patterns, and residential history), and having consulted with two pediatric oncologists who helped review all the information, MDPH concluded that it was unlikely that PAVE PAWS played a primary role in the occurrence of Ewing's Sarcoma. She further noted, however, that MDPH is continuing to monitor Ewing's Sarcoma on Cape Cod, and is also doing follow-up work on childhood cancers in the towns of Sandwich, Barnstable, and Mashpee, and expects to be issuing a status update on that study fairly soon.

Questions and Comments from SMB and Public

Capt. Abel referred to Sunday's Cape Cod Times and asked if there would be another news release discussing accusations from the Air Force scientist who spoke as a private citizen in one portion of the article but not as a private citizen in another portion. Ms. Steele replied that there have been a number of newspaper articles in the last three to five days, including today.

Ms. Zuern asked if MDPH's continued monitoring would include an effort to look at other possible sources of the cancer. Ms. Steele replied that at this point MDPH will be looking to see whether any new cases occur. She also said that some of the individuals are participating in the follow-up work

being done currently in Sandwich, Mashpee, and Barnstable. Ms. Zuern asked if all the study participants would be given some kind of survey that might show a common thread among them, which is perhaps being overlooked. Ms. Steele replied that MDPH is and has been conducting interviews of the families involved with the Sandwich work. She also said that because the Commonwealth has one of the best cancer registries in the country, MDPH is confident that the universe of individuals diagnosed with Ewing's Sarcoma has been identified. She then said that the initial look at spatial and temporal patterns, combined with the information about PAVE PAWS, indicates that PAVE PAWS doesn't play a primary role. She also noted that no information at all is available on potential risk factors for Ewing's Sarcoma, so at this point MDPH plans to focus on the Sandwich effort and continue to monitor Ewing's Sarcoma to see if the trend of elevated rates continues or drops down.

Ms. Garcia-Serrano asked if MDPH has come out with any other theories about the elevated incidence of Ewing's Sarcoma on Cape Cod, such as more surveillance, more awareness, or a change in detection technology. Ms. Steele said that there's no explanation at this point. She also said that she doesn't think increased awareness or improved diagnostic techniques are an explanation because, if so, it's likely that an elevated trend would be seen statewide and nationwide.

Mr. Dow inquired about the existence of any animal models with diseases similar to Ewing's Sarcoma, which could be studied so that a cause/effect relationship might be developed. Ms. Steele replied that she's not aware of any such model in the scientific literature, and added that she's not aware of any information about environmental risk factors for Ewing's Sarcoma. She also noted, however, that some information is known about the pattern of its occurrence – it occurs primarily in teenagers, and Caucasians are at a much higher risk than non-Caucasians. Mr. Dow reminded the group that one of the NRC's previous recommendations relating to PAVE PAWS was for more studies to be done with animal models in order to be able to develop a dose/response relationship – not only for power density but also for the frequency component, which Dr. Albanese said is what causes problems in chromosomes. Mr. Dow stated that therefore it seems to him that another epidemiological study is not the way to approach this problem. Instead, as recommended by the NRC, he recommends that this issue be studied in laboratory animals, a dose/response relationship developed, and then a risk assessment conducted.

Agenda Item #7. Camp Edwards Small Arms Ranges Update

COL FitzPatrick showed a map of the SARs at Camp Edwards and pointed out Tango Range, and Juliet & Kilo Ranges. He then reported that since the Guard received approval for a 17-month trial period for training with lead ammunition at Tango Range, approximately 20,000 rounds have been fired there. He also stated that while the STAPP bullet-catcher is a good system for managing Tango Range, a water issue remains, which is thought to be the result of condensation, as the runoff problem has been corrected. COL FitzPatrick noted that about 2,000 gallons of water has collected since the STAPP system has been in place. He also mentioned the seam issue, which has essentially been fixed. He further noted that of the more than 20,000 rounds that were fired, only about 30 went uncaptured, and this occurred when the trajectory of the bullets changed because they hit the target frame, causing them to tumble, change angles, and go through at the very top of the STAPP system. COL FitzPatrick also mentioned that the STAPP system and training activities at Tango Range have been observed by the Secretary of EOEEA, and by representatives from the Association to Preserve Cape Cod (APCC), EPA, and MassDEP to ensure that the Guard is adhering to the Tango Range Operation & Management Plan. He added that "overall it's been a good success."

COL FitzPatrick stated that, as Mr. Gregson reported, the IAGWSP is conducting soil investigation at Juliet & Kilo Ranges. He noted that at Juliet Range the Guard plans to rebuild the berm and install a

STAPP system on it, and at Kilo Range, the plan is to relocate the berm and install a STAPP system on it, such that both ranges can be operated safely at the same time.

COL FitzPatrick noted that although the initial goal was to have Juliet & Kilo Ranges operational by this April, the schedule that was presented to the Command Group last July was ambitious, and it seems probable that approval from the Environmental Management Commission (EMC), EPA, and MassDEP will not be obtained until the summer, depending on results of the soil investigations and whether any lead or nitroglycerin removal are required. COL FitzPatrick also said that lessons learned from Tango Range are being applied at Juliet & Kilo Ranges to ensure that they are operated in a safe manner that protects the water resource.

Agenda Item #8. SMB Meeting Schedule and Adjourn

Mr. Green stated that the SMB will meet next at the Bourne Best Western on March 26, 2008, at 6:00 p.m., a half hour earlier than the regular start time. He then adjourned the meeting at 8:12 p.m.