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FOR
NAS JRB/ARS WILLOW GROVE

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Meeting held at the Naval Air Station Joint Reserve Base at 6:00 p.m. on the above date before Kimberly A. Overwise, a Registered Professional Reporter and Notary Public of the Commonwealth of Pennsylvania.

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PRESENT:

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CDR. GIL VIERA
CHARANJIT GILL
SCOTT SHAW
RUSS TURNER
JIM COLTER
ERIC LINDHULT
THOMAS HIBBS
JOHN C. MARTIN
KAYE MAXWELL-MARTIN
JEFF DALE
CARL REITENBACH
JIM VETRIM
LIZ GEMMILL
RICH PEFFALL
TED ROTH
LCDR. BILL SCHOEN

MR. EDMOND: Again, I'd like to welcome everybody here. I'd like to welcome everyone back. Thank you for coming to our RAB. Hope everyone is having a good spring or summer, whatever you want to call it. I know it's after Memorial Day but it's summer to me.

I'd like to let you know some things that are happening. Again, the Air Show is going to be the 7th, 8th, and 9th of September. Some of the acts that are going to be here will be the Blue Angels, the Misty Blues All-Women's Skydiving Team, Beauty and the Beast Wingwalking Team, Red Dragons Aircraft Squadron, and Manfried Radius Glider and Aerobatic and Stunt Pilot. Again, hopefully I'll have take tickets for everyone this year for the Friday show. We'll see how that works out if the XO cooperates with me on that.

Some other things coming, there's a Native American Powwow that's going to be on the Base June 2 and 3. That's past. So sorry. That was the 2nd

and 3rd. It was very nice. You should have been here. What I have here is the NWR happenings. We'll tell you everything that's happening on the Base for catering parties, affairs. There's things here for that. Anyone that wants one, feel free to take it.

CDR. VIERA: I think we may have talked about this the last time but we're doing a Friday night show. We have a night glider that's going to do a night performance with lights. We have fireworks and I think the Misty Blues, the female jump team, will be skydiving at night. They'll also have lights. As I said, we'll finish it off with fireworks. At that point it's for all audiences but the day show we'll get you all VIP passes so you can come for the day show on Friday. That way you can avoid the 250,000 people each day Saturday and Sunday.

MR. EDMOND: Thanks, XO. With that, just please before everybody leaves sign the sign-in sheet so we get a good count of everyone who's here so

everyone gets minutes and all that.

The original agenda showed that we were going to give a short presentation. We're going to switch it around, turn it over to Gill and the Air Force is going to give their presentation first.

MR. GILL: Thank you, Jim. Thank you for letting us do the presentation first because Scott has to leave. Today we're going to discuss the results of the just completed natural attenuation evaluation at the POL area. And the second thing we're going to discuss is a two-year pilot study we did on Base for remediation. And the third thing we're going to discuss is remedial alternatives, what we are thinking about doing at the site based on the study we just completed. I'm going to have Scott Shaw go ahead and do the presentation.

MR. SHAW: Before we get started, I need to know if everybody got a copy of the notes for tonight.

Like Gill said, I want to

talk about three things in particular tonight. The first is the natural attenuation evaluation that we recently completed for the site, the ORC pilot study that is almost finished, and the review of remedial alternatives that we're currently finishing up right now as well.

The natural attenuation study basically looks at processes that are going on within groundwater in this case to remediate concentrations of contaminants at the site. In this instance, we did five different things. We looked at what are called redox parameters in groundwater. We evaluated groundwater quality over time for those constituents that are related to jet fuel. We used the GIS, Geographic Information System, to estimate contaminant mass in place over time, the amount of contaminant present in groundwater over time. And from that information we estimated what we call intrinsic bioremediation or the rate at which contaminants are being removed from groundwater and from that we predicted a

time to attaining Pennsylvania cleanup standards.

This first slide shows a couple things. It shows what goes on in a typical aquifer contaminated with hydrocarbon fuels. You go from a zone where the contaminants are that does not have any oxygen in it, what we call anaerobic, to oxic environment downgradient. And in that process the plume has some pretty characteristic reactions going on. Carbon dioxide in groundwater is being converted to methane through a methogenic process. Sulfate is being converted to hydrogen sulfide through sulfate reduction. Iron 3 is being reduced to ferrous iron, iron 2. And nitrate or manganese is also being reduced.

At this particular site what we found was that background water quality, meaning water away from this contaminant source area both upgradient and downgradient, is aerobic. It has oxygen in it. Groundwater within the core of the plume is anaerobic. It doesn't have

oxygen. There's a distinct lack of oxygen in the groundwater. And those processes of iron reduction, sulfate reduction, and methogenesis, are taking place. They're measurable. We measured especially those three, the end products of those three reactions to come up with mass balance equations and things like that that helped us come up with the rates and then predict time. One of the things we did was we looked at concentrations of compounds in groundwater over time.

This is the POL area on Base from 1992 and these are the off Base properties. The two things I want you to notice are first this stippled area is an area where in 1992 they noticed free phase hydrocarbons. In other words, you looked at it and you could say, oh, that's oil. And then the other thing are the concentration lines. In this case this is for benzene. The iso concentration for benzene at this point is 5. That is the Pennsylvania MSC, the cleanup standard for benzene. This is in 1992. I'm going to

show you two other dates. 1996 you can see we're no longer seeing the free phase hydrocarbon in areas downgradient. We're not seeing as much of it in these areas. It appears to have shrunk.

MR. TURNER: What did you say the stippled area was?

MR. SHAW: I apologize for the contrast on this. The stippled area is here and before it extended down in this direction. I think you can see the blue iso concentration lines. Now, this is our current understanding of distribution of contaminants in groundwater. The stippled area is now we believe based on my observations at the site limited to an area immediately downgradient. Groundwater flows in this direction above the POL area and there is a small area down at this property corner. There are two iso concentrations here. The blue once again is for benzene with the outer one being the MSC of 5 and then this orange is for a compound called napthalene. It's also a product of jet fuel decomposition. And

that's the MSC for napthalene of 100 parts per billion.

I talked about earlier we used the GIS system to estimate contaminant mass in place over time. What the program does is connects up triangulated areas based on locations of monitoring points. If you superimpose this image over the ones you see before, you would have seen a monitoring well at that intersection. And it uses the concentrations as well as elevations of groundwater and known conditions of porosity and things like that to come up with annual mass. From this you can see the dark, typically taller column is for that -- this is benzene. It's from 1996. You can see over time from 1996 to 2000 how there's been a steady decline in those concentrations.

Knowing what those masses were, we developed a series of curves or straight line plots to come up with two things. One is a degradation rate and the other is a half life in this case for napthalene over time. Napthalene

unfortunately has been measured very infrequently at this site. It was measured during our entire ORC study but prior to that it was only measured once. So the three points that you see here were from 1987 and basically the beginning and end of the ORC study.

These rates were then applied to a model, an analytical model to make some predictions about how quickly the site would reach compliance, the compliance standards we talked about before, the Pennsylvania compliance standards. I'll show you what those results were.

What were our conclusions from the natural attenuation evaluation? First, that when we went out and measured those products and parts of those reactions, we saw that based on the concentrations of methane, hydrogen sulfide, and iron that there is evidence of natural biodegradation taking place. Second, intrinsic biodegradation has destroyed several hundred pounds of dissolved JP-4 constituents. The two we

looked at were benzene and napthalene. They're the two currently over the Pennsylvania standards at the site. And we were able to determine based on those rate constants and looking at those mass in place calculations that several hundred pounds of those constituents had been degraded.

MR. TURNER: Is that during the study?

RAB MEMBER: That was my first question, time lapse.

MR. SHAW: From 1987 to the year 2000. Actually, November 2000.

RAB MEMBER: And you're talking about what on this stuff, 6-1/2, 7 pounds per gallon?

MR. SHAW: Oh, no. We measure -- we have to go back and look at that other -- I'm not sure what the molecular weight is of those two compounds to answer your question. They're a little bit that goes a long way is probably the best way to describe it. They are components of JP-4 and -- well, JP-4 is jet

fuel.

RAB MEMBER: Which is around 8 pounds per gallon.

MR. SHAW: It's probably a fraction of that, 25% at the most.

RAB MEMBER: So we're talking about 2 or 3 hundred gallons might have been destroyed?

MR. SHAW: Of just those constituents, of just those pure constituents realizing that those pure constituents were only a fraction of the total mass.

As you recall from the year 2000 map that I showed you, that LNAPL residual is still -- you can see there's oil present both on and off property and this is slowing the natural attenuation. It's still acting as a source of those two compounds in particular to groundwater.

RAB MEMBER: Does anybody know how much jet fuel was dumped in this area?

MR. GILL: Back in '79 it was 8,000 gallons spilled.

RAB MEMBER: 8,000?

MR. GILL: Yes, sir.

RAB MEMBER: More like 80,000?

MR. GILL: No, it wasn't 80,000. It was 8,000.

MR. SHAW: There has been no observed decrease in dissolved contamination at DM-11. DM-11 was that small area off-site where we're still seeing some residual. And the model predicted that the bulk of the plume would achieve compliance standards for benzene and napthalene, benzene in about 7 to 18 years and napthalene within one or two. And napthalene in most of the instances where we're seeing it, we're seeing it in about four wells, three or four depending on which sampling event. The MSC for benzene is 100 parts per billion and we're getting 105 and it will slip down to 95 and go back and forth across that compliance standard. Currently no data exists concerning natural attenuation of these products in soil. There's a fraction of

those constituents also present in the soil above the groundwater.

That leads to the other study, the ORC study that I talked with you all about on a number of occasions. The objects of the ORC study were to evaluate performance of ORC in treating the JP-4 constituent in groundwater. As you recall, ORC is a magnesium hydroxide formulation that slowly releases oxygen to groundwater for use in biodegradation processes. It's a slow release process. It's a passive remediation.

What did we do? We installed ORC in two what we call fence lines, a series of small diameter what we call geoprobe borings along Andrews Road. And groundwater flows in this direction and then on the upgradient side of the POL area. And we assessed performance of ORC in terms of oxygen delivery and the contaminant loss in groundwater over the two-year period.

The next thing is a simple cartoon of what we did. Oxygen is released

in these fence lines to help stimulate a bioactive area to start to destroy those compounds in groundwater. I'll show you two slides. DM-3 is a location immediately downgradient from that downgradient fence line. And we saw that prior to this line right here, prior to ORC installation, there appeared to be a reasonably good trend in decline of in this case benzene in groundwater. We installed ORC in February of 1999 and we continue to see a decline, but the other thing that we observe is the concentrations have risen. This could be from a number of things, including we held off on the study, on the ORC study because we were in a drought at that time. And then the water level rises again. You can see increases in concentration as a result of that rise.

The next thing we did was about a year ago, a little over a year ago, we placed ORC socks in a couple of the wells, including DM-3. We see a little bit steeper decline in the concentrations of benzene but even with the direct

application, and this is a pretty direct application of ORC to water, the concentrations that we're seeing are still only slightly lower than what was being observed before ORC was in place.

RAB MEMBER: Is ORC like HRC, the biomass that helps slough off or desorb material from the soil?

MR. SHAW: Well, HRC is a hydrogen release compound. It creates a biomass. It's kind of for the other -- you try to achieve the opposite end of the spectrum. With ORC you're trying to add oxygen to the system. The compounds that you try to treat with HRC typically degrade a lot faster in an anaerobic environment but the object is the same.

RAB MEMBER: You get a sloughing off or desorption of the material?

MR. SHAW: Not as often with ORC as HRC.

The next one is for DM-11. This well is significantly downgradient. We never expected to see a reaction to ORC

in this particular well. We did apply I think you can see over time -- and this is from 1987. Over time we see what may be a slight increase. There are very few data points to be able to tell if that is an actual increase. There is an increase slope. We applied ORC in the form of socks and we do see a perceived decrease in those concentrations but once again that decrease is not that great when you look at the concentrations you've seen at that particular site, at that particular well over time.

What were the conclusions from the ORC pilot study? The first, we determined that, you know, based on that first graph that you saw that sitewide contamination concentrations in groundwater are diminishing greatly by natural attenuations. There's been an obvious decrease in attenuations and we think it's largely attributable to natural attenuation. ORC did not significantly increase the overall rate of contaminant removal. We applied a couple of

statistical operations to the data and came up with within reasonably good confidence that ORC was not increasing net rate of contaminant reduction.

Once again, the presence of the LNAPL at the site is still probably impairing the success of the test. It's still providing a source of those two contaminants particular to groundwater. Knowing from this first point the natural attenuation is diminishing the concentration in the groundwater, we concluded that aerobic bioremediation is a viable option for the site but delivery of oxygen via ORC is still low to be effective, especially in the short term. You can't deliver it fast enough to be used to achieve cleanup goals.

That led to our next study where we evaluated various remedial options for the site. The first thing we looked at was monitor natural attenuation. What you do there is set up a series of monitoring points, long-term monitoring points. You set up a semiannual or annual sampling

program to look at the same parameters we did in our natural attenuation study as well as the contaminants. And you establish a contingency plan in the event the contaminants persist or increase. If it looks like everything's going fine and all of a sudden it begins to spike up again, you establish a contingency plan at the very beginning to affect another type of remediation to assist in this.

What are the advantages? It's easy to implement. And at this particular site the occurrence of natural biodegradation has been proven. We know it's going on.

What are its disadvantages? It hasn't been effective in preventing off-site migration of the plume. It's not expected to meet the MCS for groundwater in the short term. And it's not an effective remedy for the remediation and elimination of the LNAPL that's currently acting as a source of contamination.

We looked at soil excavation particularly down in the DM-11 area. I

don't really need to go through a description of what soil excavation is but its advantages are that it's highly effective. You can go and dig up soil and remove it fairly efficiently. Its disadvantages are it primarily addresses soil, not groundwater, and groundwater is an issue. You have potential of missing portions of the contamination, especially the LNAPL can be tricky to find and dig up. That area is wet at times and we don't like to do a lot of digging down in those areas. And also because of the greater chance of exposure, there's a greater chance of exposure for the people working at the site. And it's probably the more expensive of the options we've looked at.

The next thing we looked at was a process called air sparging, air sparging and bioventing. In air sparging you inject air into the saturated zone below the groundwater to simulate biodegradation of jet fuel. Bioventing is almost the exact same process except you do it above the water table. You inject air

there typically at higher -- a little slower injection rate to stimulate the biodegradation in that process. We would install several bioventing and air sparging wells, especially in this LNAPL residual areas. And in this particular case because of the high water table down in that corner, bioventing, the injection of air above the water table, probably wouldn't be that effective. It's a very shallow water table. It's reasonably effective on a local scale. If you put one of these wells or a pair of these wells in a very small area, you can almost be guaranteed that around that well you'll be affecting a remediation. It's difficult to prove how far out from those wells that you are.

RAB MEMBER: Are you really biodegrading or are you just putting air in and carrying it up in the atmosphere?

MR. SHAW: It is clearly a combination of both. It's clearly a combination of both. You're adding oxygen to the system that has been depleted. Remember, it's anaerobic and these

particular type of hydrocarbons degrade favorably in an anoxic environment. So there is a certain amount of volatilization. That's clear. But you're also doing a certain amount of stimulating of the biological activity.

RAB MEMBER: Since the other oxygen program wasn't terribly successful, wouldn't all the gain we get from this be by putting it into the atmosphere?

MR. SHAW: First of all, the volatilization would be taking place below the saturated zones so it's not exposed. There's a small portion on the surfaces, the top of the water table, that's exposed to air. And there would be some volatilization but I don't know that you can actually say that most of what you're going to be doing is lost to the volatile fraction.

RAB MEMBER: I kind of forget the geology here. We're talking about the contaminants residing in the soil, not the bedrock?

MR. SHAW: That's correct.

RAB MEMBER: How far down is the bedrock?

MR. SHAW: That depends. Here it's anywhere from about 12 to you have a couple wells where it's as deep as 24 feet.

RAB MEMBER: So if you do air sparging, your zone of influence is going to be minimal.

MR. SHAW: Right. That's another good point. The deepest we can install the well is about 24 feet. And that's in an area where we don't have contamination anymore. The areas where we're talking about, the depth of bedrock is somewhere between 12 and 15 feet. We don't have a very large column.

RAB MEMBER: Along the lines of regulatory involvement, would they allow you on the air sparging to just vent it into the unsaturated zone to allow degradation to occur there?

MR. SHAW: I'm going to get to that. That's one of my disadvantages. That's actually one of the disadvantages.

You're right. There's going to be a certain amount of volatilization. It depends on the concentrations you see in the soil. But our regulations that we work under also control that as well, how much we discharge to the air. And that would also be what we consider a disadvantage in this particular case. Sometimes it's hard to quantify, especially when we may be dealing with small concentrations in discrete zones. And it can be difficult from an engineering standpoint to deal with.

Now, the next method we looked at in the ORC study we used a slow-acting compound to release oxygen into the groundwater to stimulate biodegradation. It was a passive remediation. It was one where we install it and then we walk away and monitor what happens.

There are more aggressive methods of applying oxygen to the subsurface. This is one of them. We use hydrogen peroxide and nitrate, the nitrate

principally as a nutrient to add oxygen to those areas where we need to do a lot of degrading. Once the oxygen is consumed downgradient, nitrate is also applied to stimulate, to act as a fertilizer, if you will, to stimulate biological activity. Once we delineate those LNAPL residual areas, we would either inject in wells or through infiltration galleries hydrogen peroxide and nitrate. We'd extract it downgradient and then reinject it upgradient.

Sort of another cartoon explaining how it would happen. We would have a series of wells downgradient of a highly contaminated area. We would extract groundwater there. We would add nitrates, some nutrients, and reinject it upgradient. Remember from that map how groundwater flowed toward the northwest. We would extract up in the northwest, bring it over a certain distance above the LNAPL residual area, and reinject it at controlled rates to effect bioremediation in the dissolved plume.

Now, as opposed to the ORC, this is a much more aggressive application. We can control the amount of hydrogen peroxide that we put into the well thereby controlling the amount of oxygen. And we can directly measure the results in downgradient observation points.

RAB MEMBER: Nitrates are not a real pretty thing, are they?

MR. SHAW: No, they're not. You hit on all the good disadvantages. It is something that we have to look at. There is an MSC. I believe it's 40 milligrams per liter for nitrates. And we would have to get regulatory approval to first of all inject and probably not be allowed to amend them to the level above that concentration.

RAB MEMBER: People drink this water. Nitrates are not good for people. Some of this water is going to get into Delaware Bay just as it has in the Chesapeake Bay. And that poses a major problem to the eco system down there.

MR. SHAW: The primary

components of what's going on here of what we would be doing would be the hydrogen peroxide. We would work with the state in determining if nitrates could be used and at what concentrations.

The other process is a direct chemical oxidation once again using hydrogen peroxide but then also using a couple other compounds, principally something called Fenton's reagent, to directly oxidize the compounds in the soil. This is not the addition of oxygen to stimulate biodegradation. This is the injection or application of oxidants to destroy, demineralize the contaminants in this case not only in groundwater but also the soil.

What would this involve? It would involve once again the injection of wells on property in those areas that we delineate that LNAPLs are present. We would collaborate, use a specialty contractor, somebody who is very experienced in applying these compounds to the ground. We would use three or four

injections of this Fenton's reagent typically in pulsed instances monitoring performance between them. And because of the high concentrations of oxidants, we would not be using that in the DM-11 area because of the shallow water table. The water table up on the site is much deeper than it is downhill. Up on the Base, the depth of the water table is anywhere up to 10 feet giving us enough room to use these particular compounds.

Based on that, based on those evaluations, what do we recommend? The first thing we want to do is -- I don't know if you recall from the year 2000 map, we had two distinct areas where we know LNAPL is present both on Base and off property. There's a gap between those two locations where we haven't observed it in wells in that area but we feel we need to better delineate the presence of LNAPL free phase product in the soils. With that done, in that process, we'll be measuring BTEX and napthalene and, in conjunction with the state, develop a series of minimum

specific concentrations for soil.

The first thing we would do would be to implement Phase 1 and that would be in the LNAPL residual areas. For the area around DM-11, implement the hydrogen peroxide/nitrate based remediation, set up a series of injection wells upgradient of any LNAPL areas we find, extract it downgradient, reinject it, and monitor the progress. On the Base itself, because we have enough soil above the water table, implement the chemical oxidation, use of Fenton's reagent, measure the effect of both of these on the plume, and then advance to a second phase or full-scale sitewide in this case application of both of those remedies.

And that's it.

RAB MEMBER: If I may with another question, that JP-4 is still just sitting there; right?

MR. SHAW: It's sitting in a couple different places.

RAB MEMBER: But it's sitting over top of the benzene and the

napthalene?

MR. SHAW: No. Benzene and napthalene are a component of JP-4.

RAB MEMBER: But if we go back to your slide on Page 7, bottom of Page 7, this one and this one on Page 4, you're showing the JP-4 is still sitting there, we're not addressing that, and what we're going over is derived from the JP-4 and it's going to continue to leach out.

MR. SHAW: Both of these processes -- if I can back up, that's the slide you're talking about. What we try to show in this slide is a couple things. You can see this blue line. This blue line is the water table. What's above it and below it is soil. JP-4, what we call the JP-4 residual is old product from these tanks that has gone down, hit the water table, and for the most part until it all dissolves floats. Well, the water table rises and falls on a regular basis, seasonal basis. As it does that, you get what we call residual smear in the pores of the soil. So there is no free phase

benzene or napthalene. This is a residual area that both of these remedial options will address. Remember --

RAB MEMBER: Isn't the JP-4 the source of the benzene and napthalene?

MR. SHAW: Yes.

RAB MEMBER: If we treat the symptom, which is the benzene and napthalene, and leave the JP-4 there, it's going to continue to produce and we ain't never going to get nowhere.

MR. SHAW: Both of these processes will directly --

RAB MEMBER: I missed that.

RAB MEMBER: I think one way to explain it is benzene is an indicator parameter. All these are hydrocarbons which can be easily bioremediated through aerobic means. So if you are consuming the benzene and napthalene, which are the ones that they are concentrating on, the other parameter, your xylenes, toluenes, those other parameters are also being consumed but they are not measuring it. They're targeting ones easy to identify and from a

health risk more important than the other ones if that's --

MR. SHAW: Couldn't have said it better myself.

RAB MEMBER: Also the JP-4 is there, it's still going to be there.

RAB MEMBER: But let's say benzene is 20% of the J-4. So if you take a compound of benzene and consume it, you are more than likely also consuming between 4 and 6 pounds of J-4. So as the benzene goes away, a significant portion of JP-4 also goes away.

MR. SHAW: You're right to a certain extent but you do have to directly impact that residual hydrocarbon. And both of these, especially -- not this one but the other one are directly applied to that residual JP-4. In this case, we use extraction wells and injection wells. We'll be lowering the water table at one point and raising it at another to affect that residual.

RAB MEMBER: Excuse me. Is this system in use anywhere?

MR. SHAW: Yes. It is currently in use at a number of sites by the Air Force to remediate JP-4.

RAB MEMBER: How's it working?

MR. SHAW: They have very good results.

RAB MEMBER: Percentagewise?

MR. SHAW: I don't know.

MR. EDMOND: My only concern is being the water producer for the Air Station, putting the nitrates into the aquifer, which are going to basically get into our water system, is there a treatment to take the nitrates out?

MR. SHAW: The nitrates are strictly an option. If nitrates are applied, they will be applied at concentrations that PADEP agrees to and will be below the concentrations.

MR. EDMOND: Is there any way that PADEP would make you measure what amount of nitrates are getting into the aquifer?

MR. SHAW: I'll guarantee you they will make us do that.

RAB MEMBER: The nitrates are also consumed.

MR. SHAW: Thank you very much. It's not like every bit of nitrate you put into the system is going to be heading right to the local drinking water well.

MR. EDMOND: See, my worry is that one of our major problems here, people are worried about drinking water. EPA has put some really negative things on one of their web sites about our drinking water which is totally out of line and wrong. We had to correct that but we still have gotten complaints from people that used to work here, am I going to die, was the water safe when I was here. When people find out we're adding stuff to the water, I'm going to get complaints about is this water safe to drink again. That's my concern.

MR. SHAW: And to the point that this gentleman made, the purpose of

applying the nitrates is so they can be consumed. They're going to be applied at low concentrations, probably not above the MSC. And it is an option. The primary component of this particular remedy is the hydrogen peroxide that turns into water and oxygen.

RAB MEMBER: Shouldn't the nitrate reduce to ammonia?

MR. SHAW: That's right.

RAB MEMBER: This is essentially a closed loop system where you get some leakage but the water you pump in with the nitrates and radicals will get pumped out again.

MR. SHAW: That's right. It is a closed system. We've also done a number of monitoring events where we have sampled the bedrock -- water in the bedrock and water in the overburden. And we haven't seen any constituents from this site in any of the bedrock wells on this site. DM-5 is extremely close to the POL area, extremely close. We've never detected anything.

Anything else?

MR. EDMOND: Any other questions for Scott or Gill?

RAB MEMBER: How feasible is it to pump this JP-4 since it floats on top of the water, pump it out, get it refined, recycled?

MR. SHAW: There is some fraction of that you can actually see that is actually floating. The majority of the JP-4 is no longer floating on top of the water but attached to pores. It exists in two different phases in the soil. It exists as floating product and as the water table rises and falls, it loves to adhere to the soil.

RAB MEMBER: If you aerate that soil, get it up to the surface, air oxygenate it, you're telling me that's more expensive than what you're proposing?

MR. SHAW: It is but that addresses in this instance just the soil component. We still have a groundwater component we have to deal with. There's a portion of it of -- the benzene and

napthalene, those concentrations dissolved in groundwater that that particular remedy would not address.

RAB MEMBER: I know something about nitrates. I had a restaurant and we wanted to expand and they requested a system. I said, what is it? It's a series of baffle tanks that are bought by a fellow up in Plumsteadville that can be hooked up modularly. The magic here is you put a compressor on it. So they're putting compressed air in the baffle tanks and the effluent comes out cleaner than the well water. This was designed by the U.S. Navy in the 1950s. So how about the feasibility of pumping air into there to oxygenate underground to make it work?

MR. SHAW: Well, there are two problems with that. One, that won't address this part of the residual that's up in the soil that doesn't have groundwater, the unsaturated soil. There is a portion that's there. And we attempted that years ago on Base. And because of the structure

of the POL area, the buildings, the tanks and things like that, it was very hard to implement at that particular location. In that downgradient around DM-11, this unsaturated zone is highly variable to begin with and it's as shallow as a foot to 2 feet. It's a very small area there that that would actually be effective.

MR. EDMOND: Any other questions for Scott?

All right. Thank you Scott, Gill.

MR. EDMOND: The Navy has just a short presentation. Jim's going to update on what's been happening since the last time we met. Jim Colter is our RPM, remedial program manager. And then Russ Turner, who is our remedial contractor but is also our contractor for doing electronic environmental management system, will give you an update on that.

Jim?

MR. COLTER: Thanks, Jim. For those of you who don't know me, I'm Jim Colter from the Philadelphia office of the

Navy Facilities Engineering Command. And our office is in charge of the funding that gets filtered to Willow Grove for cleanup of past hazardous waste sites, IR sites. Since the last time we met, basically what we've been working on is finalization of a couple reports of which the last two RAB meetings we gave visual presentations. The one report we're working on is finalizing the remedial investigation and feasibility study for the old fire fighting training area, IR Site 5. We have a lot of data from the USGS that we subcontracted to that did a lot of work for us and Ron is putting the final touches on those reports, forwarding them to Russ and Tetra Tech, who is incorporating that data in the final reports. We're doing the feasibility study concurrently that we're going to recommend some alternatives for the groundwater contamination at the fire training area.

The best estimate now is that the last of the USGS data, Ron --

MR. SLOTO: It's done and it's to Russ already.

MR. COLTER: So we're looking at about another month or so, Russ?

MR. TURNER: I hope not more than a month.

MR. COLTER: To incorporate into the RI and feasibility study which follows shortly after that. The process after that would be to sit down with the EPA and write what's called a preferred remedial action plan. It's an administrative document that we have to prepare that outlines what all the -- basically summarizes the feasibility study alternatives and then recommends what we think our best approach would be. Because we're an NPL site, we have to follow this administrative process. So we'll be hopefully having a decision working with the EPA toward the end of this fiscal year, toward the end of this calendar year.

Funding for all of the Navy's environmental programs has been cut off for the fourth quarter because of the high energy bills. Since the Secretary of

the Navy has dipped into its other pots of money to help pay these bills, our environmental cleanup fund is one of those pots. So as far as additional field work and additional actions, we're pretty much stuck in the mud until the next fiscal year starts, but that's okay because all we're doing is finalizing reports, making decisions. And in the next fiscal year, we should be in a position to install a system at the fire training area.

The other initiative we're working on with EA Engineering and Carl Reitenbach to my right here as a project manager is putting the final touches on the annual report for the Navy's fuel farm and our LNAPL recovery system that's been in operation since 1998. We've been doing it for three years now and we have a lot of data and a lot of trends that we're seeing. And so Carl sent us a draft in March that Jeff and myself will review and gave some recommendations and talked to Carl about what our next step should be.

And in a nutshell, the

system when it first turned on was very efficient, recovered a lot of product. In our case the product is actually in the bedrock so it's a little bit harder to get to. As you've seen in other presentations, we tried to depress the water table to open up the bedrock fractures and allow the oil to flow into the wells. What we're finding lately is we're getting very little recovery and that's probably because we've gotten rid of most of it. But now our system is running too many dollars per pounds recovered and it's getting to be inefficient. So the report will recommend that we shut off the artificial depression of the groundwater through the vacuum phase and go just with typical hand-bailing of the wells either with bailers or absorbent pillows or some other method like that. And then we're going to look at the site. We haven't taken samples for about three years of the groundwater so we want to do an overall snapshot of what the site looks like and talk with PADEP about requirements for site closeout under their Act 2

guidance. Again, we'll finalize the report this fiscal year but we won't be able to do much in the field until next fiscal year. That's basically about it.

MR. EDMOND: Our next meeting we'll probably put the feasibility study on the table for them to look at?

MR. COLTER: Three months?

MR. EDMOND: No. We're going to change it to five.

MR. COLTER: By then I'm hoping to actually have it out for draft review and have it finalized.

MR. EDMOND: And they'll get a copy.

MR. COLTER: Yes. They'll also be getting a copy of this final report. I probably have about two more weeks to get it all packaged together and sent out.

RAB MEMBER: It's good to hear a concern about cost per pound recovered but this comes from the same people that the least expensive way to get rid of it was just pour it out on the

ground.

MR. EDMOND: But in the days that was happening, that was happening with everybody. Joe, your next-door neighbor was changing his oil and pouring it down the sewer also. They were cleaning lawn mower parts with gasoline and smoking a cigarette at the same time.

RAB MEMBER: They're not around anymore.

MR. EDMOND: We don't do that anymore either. I can guarantee you. As the world turns.

RAB MEMBER: I'm saying the cheapest way isn't always the best way.

MR. EDMOND: I'll turn it over to Russ, who's going to give a short brief on our ER system. I think we've told you the minutes are on the web now. We're going to get the administrative record entirely on the web. We'll start E-mailing you the invitations to the meetings. We're going to try to go electronic, save the government money than by mailing stuff to you, reproducing in paper and you can look

at it on the web. But if you don't have a computer, we will send it out by paper, the reports, the invitations, minutes, et cetera. So, Russ?

MR. TURNER: One of the things Jim has been telling the RAB for about two years is that they are going to be putting the RAB meeting minutes on the web, worldwide web. So the Navy finally managed to do it. The objective, of course, was to make meeting minutes, handouts, presentation materials available to everyone as widely as possible electronically. So anybody who has Internet access can now obtain the meeting minutes as soon as they're published. What happens is I send you the link. You give me your E-mail address. I send you the link.

MR. EDMOND: Bookmark it.

MR. TURNER: We can send it every month. We have a significant system where we purchased equipment and we're working about a year with the environmental division at Willow Grove. Unfortunately,

with Navy concerns for security, we haven't been able to use that server to make the information available over the web. So we came up with a solution about a month ago. Talking with Jim, he said how about this, so I put it on my server in King of Prussia and he said fine.

So here's how it works. After this RAB, we'll get the meeting minutes, write them up, get them approved by the Navy. We'll have copies of Scott's and my presentation, anything else that was handed out as long as it's electronic and, if it's not electronic, we'll scan it in. So about three weeks or so, maybe a month after the meeting, we'll make the whole meeting minutes available on the web. When I do it, any RAB members or community members if they so desire who give us your E-mail address, we'll send you a notification with the link that the meeting minutes are available. And then if you open your browser, you can connect to it.

So here's what it will look like. The E-mail message will have this

address. It will be a new cabinet. That number will be some other number. And the name will be changed because we're changing our domain. But it will say something like TetraTechEnviroManager.com instead of env.tzo. We're renting a domain name. All we have to do is hook it up. So you'll click on this link. This will be the first thing you see. This opening page will give you some options. It's probably hard to read but this says meeting minutes from December 6, 2000. This says meeting minutes from March 7, 2001. So just take your cursor with your computer and click right on it and the next thing that will come up will be a menu of the items that were published from that meeting. In this case we have RAB meeting minutes, several presentations. There were some other issues, Navy action items from Jim Colter, a distribution list of the meeting minutes, who actually received it, at least the U.S. mail, and other things, RAB member comments. Jim Colter had some RAB member comments that we were able to address.

MR. EDMOND: They were for the Phase 2 RI.

MR. TURNER: For April 1998. So all those things are on there now. Has anyone here received one of those? Jim did. Okay. Did you have success?

RAB MEMBER: Yes.

MR. TURNER: Now, where it says here if you want to see the RAB meeting minutes, take your cursor and click. It will come up. It may take a little longer than that depending on the speed of your connection. It happens about like that. I have a T1 line. Does everyone have those? I guess the government pays for it.

MR. EDMOND: I don't. I have the Navy line. Nobody's slower than mine. Let me tell you.

MR. TURNER: We're saving a lot of money here with communications. I'm sure it's not the most expensive.

So what problems can you have? One of the things I mentioned, all

those documents in there, they're in their native format so you'll need the application software.

RAB MEMBER: Why don't you put them in Adobe?

MR. TURNER: We can put everything in Adobe if necessary. Right now we have Power Point presentations in there and a lot of people have Microsoft Suite with Power Point '97. If there is a problem, that will be the problem. If you don't have Microsoft Power Point '97, Word '97 -- you can see it on your handout. You can see the little icon on there. It actually shows the Word icon, things like that. So if there is trouble, it will be that you can't get at the document because you don't have the application software. And we'll have to evaluate. We don't know how serious that will be to you.

MR. COLTER: Something we may want to look at, though, is when we start putting decision documents and correspondence, we may just put them as PDF so no one can make changes to them.

MR. TURNER: Okay. Agreed. One of the values of this program we have here is it's read only. Anybody over the Internet has read only access to it. No one can change anything. I can but most people can't change anything that's in there.

RAB MEMBER: The danger of being in Word is somebody can make notes on it.

MR. TURNER: You can copy it and change it all you want but you can't change it on the Internet.

That's really all I have. If you can get your E-mail address to Jim --

MR. EDMOND: We have a sheet going around where everybody can put their name and E-mail address on it. I'll stockpile and send them to you, Russ, as we did before.

MR. TURNER: If anybody's interested, I'll leave a stack of my cards. Just take my card, E-mail me your address, and we'll add it to the list.

MR. EDMOND: Or mine.

MR. TURNER: Probably Jim's will be better.

MR. EDMOND: Russ and I communicate with each other daily. You have to understand, we got into this as ISO 1400. The president came out that military will have an environmental management system of some type. We are the guinea pigs, so to speak, for Commander Naval Reserve Force. We're the first ones. So we are the guinea pig and we're working this out. The side bar to that is Russ and I came up with this idea that everybody said, hey, we're in the year 2000, 2001. Everything's on the Internet. Why can't we have this on the Internet. We didn't know how to do it. Well, the electronic environmental management system opened up this opportunity to attempt this. We're still in the learning phase. We are taking baby steps right now. Bear with us. But eventually, as Russ and I said, the entire administrative record from the first record to the most recent documents will be on

there. We won't have a paper repository. It will all be electronic repository. I think this will help people get our message out, our information out to a wider source and the community can feel more comfortable with what we're doing. So, again, please be patient with us.

Any questions?

Well, I had originally planned the next RAB for the 6th of December but talking to my compadres, Jim Colter, Russ, and Gill from the Air Force, we realized we don't have very much to talk about. September is a very beautiful month and people would rather be somewhere else than sitting in this room talking about geology and hydrogeology. So we're talking about moving the next meeting to November 8. By that time, as Jim said, we should have our feasibility study finalized and you guys will already have been sent a draft copy to review so we can talk about that. The Air Force will be moving ahead with what they're doing. So if there's no --

RAB MEMBER: The 7th, not the 8th, which is a Wednesday night.

MR. EDMOND: It's the first Wednesday in November. It's before all the holidays. We can get in, have your RAB meeting. If there's no disagreement with that, we'll make it that day.

One other thing, when you come to the Air Show, environmental division is going to have a booth. I hope to see you all there. We're showcasing some of our achievements and the Navy's achievements.

I hope everyone has a good summer. Hope to see everyone back in November. If anybody needs anything, you have my phone number, address. Feel free to contact me. We'll get you some Air Show tickets in the mail once they're published or printed or whatever it is. And if anybody, you know, doesn't have any other comments or questions, have a great summer.
