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TECHNICAL REVIEW COMMITTEE MEETING

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REPORTER'S TRANSCRIPT OF PROCEEDINGS

NAS Moffett Field, California

Wednesday, May 27, 1992

Reported by: SUSAN M. REINHARDT

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COMMANDER HONAKER: Good morning. I'm Commander Carl Honaker. I'm the Executive Officer of Moffett Field and in Captain Gray's absence, the Acting Commander Officer.

Captain Gray, unfortunately, won't be with us today or in the real near future. He just, a week ago, went through back surgery and is currently recuperating and should be back on his feet by the end of June, so I'm going to stand in for him.

I'll have to apologize up front for not knowing names and faces. I've seen a lot of the correspondence that goes on for these meetings but, unfortunately, I have not been able to attend and meet all of you, so I hope to do that during the course of the meeting, and maybe afterwards, if we have a little bit of time.

I'd like to welcome everyone to the Installation Restoration Technical Review Committee meeting, and without wasting any time, I'd like to introduce Jim Haas, who is going to talk about the agenda today and discuss the program.

MR. HAAS: Good morning. I just found out that there is another meeting in here about 10:15 or 10:30, so I'll be brief.

We do have a couple of guests here today from

the Agency for Toxic Substances and Disease Registry. I think I got that right.

MR. WEST: Very Good.

MR. HAAS: And they have a very awkward acronym that I'm not going to try and repeat, but Mr. Maurice West and Ms. Susan Morris are here appearing today, and they're going to be doing a site tour later in the day.

Could you, just for the benefit of those of us who don't know you, say a couple of brief words about what the function of your agency is.

MR. WEST: Sure. I'd be glad to. Under the Superfund deauthorization to SARA, Congress mandated that ATSDR do a public health assessment on any site that's listed or proposed to be listed on the national priorities list.

A year ago we came out here and did the initial site scoping visit, Dr. Morris and myself, having been assigned Moffett Field, and we're ready to move into getting a health assessment at this point.

The TRC was a good forum to get back up to speed on the site and also for Dr. Morris to see it since she wasn't on the initial visits.

MR. HAAS: Thank you. The first two presentations this morning are going to be by Keith

Bradley from IT Corporation. We submitted our Draft RI Reports for OU2 and OU4 at the beginning of April for review, and Keith is going to brief the basic content of those reports.

MR. BRADLEY: What I'd like to do is reverse the order that you have in your handout. I think I'd like to talk about the OU2 RI Report first.

Now, as you recall, Operable Unit 2 is essentially all of the soils of Moffett Field, with the exception of the soils at Sites 1 and 2. Those are the two landfills, the Runway Landfill and the Golf Course Landfill. And also, the exception of two other sites, Sites 12 and 15. Site 12 is the fire fighting training area and Site 15 is an assemblage of oil/water separators and other sumps.

Those two sites, 12 and 15, were excluded from Operable Unit 2 because it is anticipated that some remedial or removal activity will take place there in the near future, so we'll incorporate those in Operable Unit 3.

So we're addressing soils at Sites 12 and 15 in Operable Unit 3.

Sites 1 and 2 soil will be addressed in Operable Unit 1.

Let me point out also that it's a Draft RI

Report. It's been submitted to EPA and the state agencies. We'll be receiving their comments shortly and then the document will be finalized.

So what I'm really presenting to you today is not a document that's been approved by the regulatory agencies. It's a preliminary look. This is the Navy's document. This is what we've submitted to the regulatory agencies for review. We anticipate some comment on that, and then we'll finalize the document 60 days after receiving their comments.

The soils. What that really means is soils from the surface down to the water table. We conducted the RI in two phases. In Phase I and Phase II we collected soil samples during the course of monitoring well installation. So we've collected soils there from its surface, then at five feet, then at ten feet, or at the water table, whichever is shallowest. And if we had not reached the water table at ten feet, generally we went down to the water table.

Now, one of the key things to remember there is that our bottom sample typically is right at the water table interface. So when we reached saturated soil, that's where we took out our bottom sample.

In addition to those samples, we also

conducted quite a few other soil borings. And in some areas, especially Marriage Road Ditch, we collected a lot of surface and shallow samples.

The RI report includes Phase I data, Phase I RI data, Phase II RI data, other Navy data -- and by that I mean the data you've seen discussed in Building 29 investigations, inferred sources 8 and 9 investigations, and that sort of thing -- and other data where appropriate. And by that I mean previous Navy investigations. And in some cases we also reviewed data, as we could find it, from other investigations in the area, such as NASA and some of the other MEW studies.

What we have included in this report -- the reports themselves -- this is Volume I of IV in the report for the Operable Unit 2 Report. And then we have a similar thing for the Operable Unit 4 Report; this is Volume I and IV as well. So we have eight total volumes.

What we've included in there is the Phase II analytical data, Phase II RI data, completely tabulated. We've referenced the Phase I RI data, which was previously submitted and published, and it's in the library in the Phase I Characterization Report.

And in the case of soils, where we rely or we

borrow heavily from other data, we actually include in separate tables those analytical data. But the complete data dump that's in here is Phase II data, and generally references other reports for their complete data sets.

I want to give you an overview of what was found at each site. Now, this is a little different. If you were to read the report you would find in the Risk Assessment section Contaminants of Potential Concern. That is generally a lengthy list of contaminants based on comparison to background levels. On the other hand, you would go to Conclusions and find what contaminants appear to be elevated or potential problems.

This list is somewhere in between. This is a list of contaminants which apparently are at the sites and are elevated and cannot be excluded as being from the sites -- as being naturally occurring, that is.

At Site 3, that's Marriage Road Ditch, our contaminants there -- and by the way, this does not necessarily mean highly elevated, this is just any contaminant that appears to be from that site.

We have phthalates, which is a plasticizer -- we see that in several places here -- total petroleum hydrocarbons, PCBs, lead and zinc, and those appear to

be confined to the shallow soils.

At Site 4 -- that's the old flux pond -- we have volatiles and we have base neutral acid extractables. So there we have just an assortment of organic contaminants and total petroleum hydrocarbons, and they appear to be right there in the immediate area of that former holding pond. They don't appear to be too widely distributed.

A note about those. Most of them appear to be at depth. I told you that our deepest sample was collected right at the groundwater, and most of those seem to be occurring at that depth.

Yeah, Bob?

MR. BOSTIC: Do you prefer that we wait until your presentation is over before we ask questions or can we ask questions as you're going?

MR. BRADLEY: I'd prefer that you ask them as we go.

MR. BOSTIC: Okay. What volatile organic compounds are we talking about?

MR. BRADLEY: I put VOCs because we had an assortment. In other words, we didn't have just one or the other VOC; we really had an assortment.

Generally, in that area, we have chlorinated solvents in that area. This is an area -- this is

immediately down gradient of Hangar 3 at Site 7, and we did have chlorinated solvents generally found in that area.

At Site 5 we find acetone, more phthalates, total petroleum hydrocarbons, low levels of PCBs and lead. Site 5 is the Fuel Farm, by the way.

Site 6, which is the runway apron, we have more fuel contaminants: benzene, toluene, ethyl benzene and xylene. PAHs are polynuclear or polycyclic aromatic hydrocarbons. More phthalates, 4-methylphenol and TPHC.

Site 7. This is right around Hangar 3, the northeastern corner, in particular. We have acetone, toluene, phthalates and TPHC.

Site 8, which is the old fuel transfer -- or rather, waste oil transfer area. We have acetone, methylene chloride, xylene, 2-butanone, carbon disulfide, phthalates, zinc and copper. So we have an assortment of things there.

Site 9. We have a couple of chlorinated solvents, DCE and TCE, 2-butanone, acetone, methylene chloride, BTEX, phthalates and copper.

I need to point out here that the chlorinated solvents DCE and TCE were generally found at depth, and our supposition there is that it may actually be

more than soil that's contaminating groundwater. It could actually be groundwater that's contaminating the soil. In other words, they were found at a fairly consistent level at the lowest depth at the water table, and probably that's the source of those chlorinated solvents.

MR. McCLURE: Keith, have you done any adsorption studies to determine what concentrations of soils it would be capable of retaining if they had been in contact with groundwater?

MR. BRADLEY: No, we haven't.

MR. McCLURE: So we don't actually know if you run that groundwater through those soils what they would be capable of holding?

MR. BRADLEY: Well, obviously they're capable of holding this much TCE, because that's what we measured.

MR. McCLURE: But we don't know whether or not they're capable of taking that up from the concentrations that are present in the groundwater or whether or not we require a higher concentration at the source to result in those residual concentrations?

MR. BRADLEY: Well, this is why they have the saturated zone. So, obviously, if in the Soil Gas

Study you're capable of drawing this much, a fairly substantial level of chlorinated solvents through the soil into soil gas probes, then, obviously, I think it's pretty common knowledge that it's possible to deposit chlorinated solvents on the soils. And it varies, depending on what kind of soils we're talking about, whether or not it's clays or sands. But I think it's pretty apparent that this is a reasonable scenario.

What we found, Jim, we tried to, at most of these sites, to actually take layers. We characterized zero to three feet, three to five, five to ten and then ten to fifteen. And typically at these sites we weren't able to see much of a pattern. We were able to see it at Site 9. We did see a fairly low consistent level at our deepest sample.

Now, we're not -- this being OU2, what we're trying to establish is whether or not -- where the contamination is, where it came from. And in this instance we're saying it comes from the groundwater, not necessarily how it got in the groundwater or what the source for the groundwater contamination is.

MR. McCLURE: My point, though, is that you don't have test results now to demonstrate whether or not the groundwater that's present there has high

enough concentrations to actually generate those concentrations in soil samples; is that correct?

MR. MARVIL: Jim, I think these were from saturated soils and so, because the water is in contact with the soils, you have to assume that it's in equilibrium.

It's just that the water is in contact with the soil and they both contain TCE, but they would partition this much in the soil, and whatever was in the groundwater samples would be that concentration of groundwater.

MR. BRADLEY: It struck us as a fairly apparent scenario. Methylene chloride -- by the way, you see that at Site 8 and at Site 9 here -- we saw that at several of the sites. Methylene chloride is a common laboratory contaminant, as is acetone, and is 2-butanone, actually.

There are approved Risk Assessment procedures for accounting for that, and at several of these sites we were able to comply with EPA guidance and determine that those were laboratory contaminants.

At Site 8 and at Site 9, however, in both cases, acetone and methylene chloride fell outside of EPA's accepted protocol for dismissing those laboratory contaminants, so we carried them on in our

discussion here as potential site contaminants

MR. SIEGEL: Any idea what the source may have been?

MR. BRADLEY: No. Methylene chloride is an extremely good solvent, but we don't have any knowledge of use of methylene chloride as a solvent because, typically, TCE was the solvent of choice at Moffett in the past.

But it's still possible that it's a laboratory contaminant, and as we get further -- well, the Navy is considering some additional follow-up study just for acetone and methylene chloride at these two sites just to confirm whether or not it is indeed a site contaminant. It probably would not impact the remediation, because in remediating TCE, for example, you would also remediate, certainly, methylene chloride, but we need to know.

At Site 10, Site 10 is the Runway Area and Chase Park, so it's a big area. We found phthalates and total petroleum hydrocarbons, and both of those were in the Runway Area. We had very little sampling in the Chase Park Area itself, but the data that we do have doesn't indicate a problem in Chase Park

MR. McCLURE: Keith, I don't believe there

was any sampling done at the sump for the wash rack in Chase Park. Is that something that you know will be followed up in subsequent investigation?

MR. BRADLEY: The wash rack in Chase Park? There is a steam --

MR. McCLURE: Steam cleaning rack in Chase Park with a sump which has been discussed in earlier Navy reports.

MR. BRADLEY: Okay. You mean at Site 16? What is that sump number? TRC removed a sump, the steam rack, and took some samples, yes, and we included those samples in our data here.

MR. McCLURE: Those samples are in the RI here?

MR. HAAS: Yes, there was a steam cleaning sump in the transportation compound, which is next to Chase Park.

MR. McCLURE: Yes. Just northwest to the northeast of the end of the football field.

MR. BRADLEY: Are you talking about this sump right here?

MR. McCLURE: Yes.

MR. BRADLEY: That's out at Site 16, and that sump was removed a couple of years ago. We included those removal data in the report.

MR. HOGAN: Chief, I think the EPA was asking for a clarification of that location.

MS. BLANK: Site 16?

MR. BRADLEY: Steam rack, Sump 16.

MR. SIEGEL: How significant are the heavy metal findings relative to the risk from the organics?

MR. BRADLEY: Let me get to that a little bit later. I've got a Risk Assessment slide and some conclusions that we'll get to.

Site 11, the Engine Test Stand Area. Around the Test Stand itself, we have phthalates, total petroleum hydrocarbons and oil and grease. Certainly, the latter two are not surprising.

Site 13, the Equipment Parking Area, we also had phthalates and oil and grease, mostly in the drainage ditch right out in front of it.

Site 14 is one of our sites that's split up into different areas. It's really an assembly of four tanks. Tanks 19 and 20, which are near the South Gate, they have been removed some time ago. In fact, those were removed before the RI began. We did find phthalates, naphthalene, phenanthrene -- we call them PAHs -- and several metals: arsenic, beryllium, selenium and silver.

Tanks 67 and 68, which are near the old Dry

Cleaners, included several solvents: DCE, TCE and DCA, and also toluene and another solvent, PCE, some phthalates and some total petroleum hydrocarbons. This is another instance where most of the solvent contamination was found at depth, so it may largely reflect contamination of the soil from the groundwater.

MR. McCLURE: Keith, in that case was the PCE also found principally in the deep samples?

MR. BRADLEY: Yeah. I believe that's the case, Jim.

Tanks 67 and 68 are not far removed from Site 18, and Site 18, as I'll mention to you in a minute, does appear to be a source of PCE.

MR. McCLURE: So the data for Tanks 67 and 68 indicates that sources, on-site local Moffett sources, would also generate that same chemical distribution profile of chemicals concentrated at the water table based on PCE concentration; is that correct?

MR. BRADLEY: Well, what we found when they -- Tanks 67 and 68 have been removed, and from the excavation samples, they did not find levels of contaminants that would imply that that was the source.

And Jim, I don't recall the details. I

believe it's side walls. In other words, th y didn't find anything there, but again, I'm not sure they found they found any solvents at all in the bottom part, to be frank with you, until they got to the water table.

So we reviewed those data, plus data from nearby soil borings. And we are near enough to Site 18 so that the downgradient soil borings could actually be impacted at Site 18 rather than from Tanks 67 and 68.

MR. SIEGEL: Were these fuel tanks or waste tanks?

MR. BRADLEY: One of them was a fuel tank, and the other one was a solvent tank.

MR. McCLURE: I guess my comment, Keith, goes to the comment that you made earlier. The fact that you had found TCE in Site 9 soil borings principally at the water table indicated that the source of the TCE must be the groundwater rather than infiltration from higher level sources.

But I think what I'm hearing you say here is that you found the same profile with the PCE in the Dry Cleaner Area, where I believe there is no credible distant groundwater source, and it seems to me that the fact you get the same profile with the TCE

indicates that your assumption doesn't hold for the TCE and DCE, that there is some other mechanism causing that stuff to be concentrated at the water table, rather than simply infiltration upward or transport upward from the underlying groundwater?

MR. BRADLEY: Here is Tanks 67 and 68, right here, Site 14. And this is very near -- I would say this must be about -- it's no more than about 50, 60 feet from Site 18, which is right here.

Now, Site 18 is presumed to be a source of PCE. Although the samples from the sump itself never confirmed PCE, soil borings nearby them picked up PCE.

MR. McCLURE: Excuse me, Keith, I'm not sure that's correct. I believe that the ERM samples of the contents of the Sump 66 did contain PCE.

MR. BRADLEY: Their soil boring right outside, if you took a soil boring very near it. But I think a sample from the sump contents, I do not believe contain PCE.

Now, if I'm wrong there, then so be it.

MR. McCLURE: I wouldn't want to continue the discussion without checking, but I believe that there was PCE in relatively high concentrations.

MR. BRADLEY: Okay. The bottom line there is that that's not just presumed to be a potential source

of PCE. There is no known or suspected upgradient source of PCE.

In monitoring Site 14 a couple of things were done. The tanks were removed and some samples were taken from the excavation.

Other things that were done were wells somewhat downgradient from those. Now, from these other borings, as well as somewhat downgradient, we picked up PCE.

Now, Jim, I don't recall where it is exactly that we found PCE, but the conclusion and the point is that we have some PCE contamination in the groundwater.

The PCE that was found in conjunction with the Site 14 sampling was found at borings taken at the water table, and it's presumed to be reflective of PCE in the groundwater from the Site 18 source. Very similar to how area-wide TCE groundwater contamination might contaminate a small sample taken at the water table.

MR. McCLURE: So, Keith, would we need to refer to both of the reports then to determine whether or not the soil samples with the PCE in them were from locations where you knew you had PCE in the groundwater or was that data reflected in the OU2

Report?

MR. BRADLEY: In the OU2 Report we refer to groundwater contamination, but we don't really discuss the groundwater contamination. But the point here is that if we have TCE or PCE in the soil, regardless of how it got there, that soil, that contaminated soil, could continue to act as a source, correct?

MR. McCLURE: I appreciate that, but you've also made the point several times, it seems to me, that the presence of the chlorinated solvents in the soils always reflects contamination from the underlying groundwater, and I'm not persuaded that that's the case.

So I guess the answer is that in order to determine whether or not your PCE-contaminated soil samples were actually taken in an area where there was PCE in the groundwater, we'd have to check both reports and overlay your PCE concentration maps.

MR. BRADLEY: You would. You would. Right.

At Site 18 we do have TCE -- well, these are all chlorinated solvents, with the exception of the total petroleum hydrocarbons. And then probably the thing we've been talking about here is the PCE, which appears to be site-related, and the TCE, which may be site-related, or some component of that TCE is also

likely to be area-wide groundwater contamination.

MR. McCLURE: Keith, were you ever able to determine the actual chemical use history of the Dry Cleaner? I don't believe I've ever seen that written down, and I know that there is a strong presumption that "Perc" was used, but TCE has also historically been widely used for dry cleaning, and I believe that "carbon tet" has also showed up in samples from Sump 91. But I wonder whether or not that the actual use history has ever been documented for that building?

MR. BRADLEY: Sump 91, I believe, is an oil/water separator. That's an oil/water separator. We had one boring nearby there?

MR. HAAS: Actually, it's some distance away, and I'm not sure how far.

MR. BRADLEY: So I'm not familiar with the data that you're referring to that shows "carbon tet" at Sump 91.

MR. MARVIL: I think Sump 91 is a sump that was newly identified next to Building 88, which did show some "carbon tet" and sludge samples from the sump. But it's currently being investigated right now with the OU4 Feasibility Study.

MR. BRADLEY: We didn't have that data for this report, so I can't speak much to that.

And as far as what was used at the Dry Cleaners, we have a presumed scenario and typical dry cleaning solvents that would be used, and you're right, certainly "carbon tet" and PCE would be used. And then I'm not sure about TCE. I don't know if that would be typical or not.

MR. McCLURE: Is there a chemical use history that's been assembled for that building?

MR. BRADLEY: Probably. There may be. And I say that because in the Initial Assessment Study, and then in the work plans, we have a very extensive use history for all of these sites. And I presume that Site 18 was included, that we had data available for that. That's where that use history would have been presented.

MR. McCLURE: So the Initial Assessment Study, to your knowledge, represents the most complete description?

MR. BRADLEY: Yes. Correct. And that was again portrayed, like I say, in the work plan. There is a rather extensive table which describes all of the contaminants -- or rather, chemicals -- that were used and the estimated volume and the dates of use.

Site 19. Tanks 2 and 43, which are near Hangar 3, we have the chlorinated solvents that I

alluded to earlier: TCE, PCE. And also we have some other contaminants: toluene, xylene, ethyl benzene, styrene, phthalates, total petroleum hydrocarbons and a couple of metals, antimony and beryllium.

Tank 14. Tank 14 is near the Line Shack, I believe. There we had a couple of petroleum contaminants: TPHC and toluene.

Tank 53, which is near the Golf Course, we had acetone, 2-butanone and BTEX.

I wanted to go through -- I know that's a rather extensive listing -- but I wanted to go through all that with you.

The approach that the Risk Assessment took was to evaluate the health and environmental impacts of all these contaminants. Now, as far as environmental impacts, we don't have much in the way of environmental receptors here.

Now, one of the points that has been made most recently by NOAA is that we would go back and, I think, add a little bit more interpretation of the environmental receptors at the Golf Course, and that being birds drinking out of the Marriage Road Ditch and the pond, the water hazard at the Golf Course, but we don't expect that to change this scenario.

We looked at the impacts of Moffett Field

eventually changing to mixed commercial and residential. In other words, the Navy would not retain control over it.

And the worst-case scenario would be houses built at these sites, workers excavating down to 10 feet to construct building foundations. So you have children playing and getting their hands dirty and sticking their hands in their mouth.

A further scenario was that the contaminants in the soil would leach down into the groundwater and then that groundwater would be used for drinking water.

So we looked at what contaminants in the soil were -- we back calculated from acceptable drinking water standards, maximum concentration limits or MCLs, that calculated into what contamination level in the soil would be acceptable if it did leach down.

So that, we considered to be, a worst-case or certainly a reasonable worst-case scenario. It's a very conservative scenario.

Using that scenario at Site 3 --

MR. BOSTIC: Keith, were you using for your health/risk assessment, health assessment, were you using a hazard index as opposed to an MCL?

MR. BRADLEY: We used a mixture. We used

MCLs to back calculate to acceptable levels in the soil. And then I believe -- I'm not a Risk Assessment specialist, Bob, but I believe the hazard index then was used for carcinogens -- I believe this is the way it works -- they are used for carcinogens for direct exposure. We did use hazard indexes and cancer slope factors. In other words, we stuck pretty much to EPA's guidance on that.

MR. McCLURE: Keith, I notice that although there is PCE in the groundwater and some PCE in the soil, that it doesn't show up for either Site 9 or Site 18. Can you explain how the back calculation worked if we don't see PCE on there -- or DCE, for that matter, which surprised me a little bit. Is this not a complete list?

MR. BRADLEY: No. For example, we'll just skip down to Sites 3 through 7. You can read that there were no chemicals that caused unacceptable risks.

At Sites 8 and 9, of the contaminants that were present, the ones that I've shown here, actually are the ones that create the unacceptable risk. In other words, the levels of TCE and PCE that were found in the soil did not create an unacceptable risk.

What did create -- well, I used those as

examples -- they're not good examples, are they?

At Site 8, methylene chloride and acetone were the contaminants that created the unacceptable risk. And that risk is due to potential leaching into the groundwater and the scenario that I just discussed with you: people installing drinking water wells and then drinking the groundwater. That's the scenario that causes the unacceptable risk.

At Site 8 it's methylene chloride and acetone, again, and TCE. So the levels of PCE and the distribution -- or rather the mass, let's say, the total amount of PCE -- did not create an unacceptable risk.

MR. McCLURE: So that was based on the actual observed soil data compared to the back calculated values?

MR. BRADLEY: Yes. Right. So that's based on all the scenarios that I discussed.

The one scenario which we did not take was growing vegetables. We felt like a person having a significant garden and eating, consuming vegetables out of the garden on an ongoing basis, was not a reasonable scenario for this area.

And that typically is a problem with metals anyway. Metals are typically the problem there with

consumption of vegetation.

Further, at Sites 14 through 19, there were no unacceptable impacts. Unacceptable, by the way, typically means greater than ten to the minus four health risk. In other words, there is a range from the ten to the minus four to ten to the minus six that fits into a borderline category.

And what ten to the minus four means is that one in every -- what would that be? That would be 10,000?

MR. BOSTIC: If you're talking about PCE, that's 500.

MR. BRADLEY: Pardon?

MR. BOSTIC: It works on an order of magnitude. If it's 5 ppbs, the cancer risk is one times ten to the minus six. 50 is one times ten to the minus five. And if it's 500, one times ten to the minus four. To my knowledge, those are not acceptable levels by EPA nor the State of California.

MR. BRADLEY: You're talking about -- well, in the case of groundwater, you simply have set criteria. You have MCLs. Maybe I didn't hear your question correctly, but in the case of soils, there is not a set remediation level as much there is a Risk Assessment process where you evaluate the exposure

mechanisms and then the attributes of the contaminants of concern. So there is not a set level as there is -- there is some RCRA criteria which apply under different circumstances.

MR. BOSTIC: I thought we were talking about water consumption here.

MR. BRADLEY: Well, even in the soils we had to look at the scenario of the contaminants in the soil leaching into the groundwater and becoming an exposure pathway there. In other words, remediation of the soil might be driven by what might happen in groundwater consumption, rather than by what exposure a person might actually have to the soil itself. And in fact, that was the case at Sites 8 and 9.

MR. McCLURE: Keith, I'm going to ask a question now, but I'm not sure whether you or Steve or somebody else might be the person to answer.

What arrangements have been made to revisit the Risk Assessment process when the investigations that are currently under way are completed and new information is available? For example, the Sump 91 investigation?

MR. CHAO: Well, we are currently investigating all those items and it would be in the Feasibility Study Field Work Plan that has been

included in all that. And basically how I understand it, is that we have our RI, then we have our basic characterization sites, and then we have the basic supplemental FS which will fill in data gaps and give us additional information and make minor revisions in the RI and the Risk Assessment.

So the RI itself right now, as I understand it, is just the basic main platform that we have, but those items will be revisited after we complete the Feasibility Study -- or not complete, but maybe the first-round Feasibility Study.

MR. BRADLEY: Jim, in addition to that, there is a base-wide Risk Assessment that will be conducted, because what will happen when we have -- we split the thing into six different operable units -- and what will have to be assessed at the end of this is cumulative risk.

In other words, let's say a person was exposed to the groundwater, he was exposed to the soil at these two operable units, then went elsewhere on the site, was exposed to those contaminants, and then we have Operable Unit 6, which is wetlands.

So after we do Risk Assessments on all of those, before a base-wide Record of Decision -- there will be Records of Decision on all these separate

operable units -- before a base-wide ROD is actually signed, it will be a requirement for a base-wide Risk Assessment, which will address cumulative impacts.

Probably the wild card there is the Operable Unit 6, the wetlands investigation, which will, hopefully -- we'll have to see what impact that has on, for example, Operable Unit 2 -- but hopefully none.

MR. STRAWN: When would that take place, that Risk Assessment, that revisiting of the region-wide, the base-wide?

MR. BRADLEY: Pardon?

MR. STRAWN: When would the base-wide Risk Assessment take place?

MR. BRADLEY: It will be at the conclusion of the investigation when the very last RI report is submitted, and that's for Operable Unit 6, the wetlands. After that, and after that's accepted, then there will be a base-wide RI Report.

MR. STRAWN: Is that next year, is that two years from now?

MR. HOWAR: July 1st, '94.

MR. SIEGEL: What about all the supplemental information that's going to come in as you do a Risk Assessment at the conclusion of RIs that do not have all the information in them?

MR. BRADLEY: It's supposed to be somewhat similar to what you're experiencing at the MEW Sites where you've actually done your RI Report in 1988, you've gone through and you've done an FS and actually arrived at a ROD, and yet you're still finding yourself doing some additional follow-up investigation. That's not at all unusual. It's not atypical.

In fact, the Navy is right now doing some -- they're doing site investigations or site inspections at three potential new sites which may or may not have impacts on these operable units, depending on whether or not they find anything.

And I think if they were to find something and it had an impact, I suppose -- well, a Record of Decision is always subject to being amended, as you know, so I'm quite certain that it would be revisited if some pertinent findings were to be found.

MR. SIEGEL: In doing the Risk Assessment did you cover the possibility of flooding? A lot of this area is a floodplain, is my understanding.

MR. BRADLEY: No. No, we did not. We did not presume that to be a -- no, we did not.

Now, I'll tell you what, Operable Unit 6 may be the vehicle there, because there the receptor in

Operable Unit 6 is the surrounding wetlands area. There you have the ecological and biological receptors as far as marine and fresh water receptors. So there that scenario, I think, would be a reasonable one to take a look at.

Here, we didn't have the receptors here. We don't have a receptor on Operable Unit 2 that would be impacted one way or the other by flooding, if you follow. We don't have any. The only receptors --

MR. SIEGEL: Yeah, it does. I don't understand how -- the Risk Assessment is based on the receptors within the operating unit or on the sources within the operating unit?

If, let's say the elevation is low enough that a 50-year flood or a 100-year flood would wash the contaminants down someplace else, that would be part of this Risk Assessment.

MR. BRADLEY: I think in reality, if we did not have an Operable Unit 6, then probably we would be looking at off-site receptors for this operable unit. But the fact of the matter is, we do have an Operable Unit 6 where we will address -- not only address, but identify the receptor.

I don't know that we have the data right now to do a thorough identification of receptors there

anyway, but the fact is we do have a vehicle for identifying those receptors in the wetlands areas and evaluating reasonable scenarios that those would be impacted from the other five operable units.

MR. SIEGEL: Not only is there a concern of just in flooding, a breaching of the dikes, but there may be deliberate attempts to restore portions of the wetlands near the runway that's already below sea level. And so that conceivably could dislodge some of those contaminants.

MR. BRADLEY: Right. That would be a scenario. Discharge of contaminated groundwater into the wetlands would be a scenario. Just general surface runoff would be a scenario. Movement back and forth of endangered species or sensitive species back and forth between operable units would be a scenario.

One of the things we are cognizant of is that future risks have to assume commercial or private development just because we cannot absolutely -- there is no absolute assurance that the Navy or any government agency will remain there.

MR. SIEGEL: I greatly appreciate that you did that. And just the other side, and left some of the scenarios for the future of the facility called for in opening up some of the sloughs and restoring

the wetlands, which could conceivably -- and I don't know which portions of the runway have those contaminants, but that conceivably could --

MR. BRADLEY: That sounds like more scenario, breaching the dikes around the evaporation ponds, because right now they're not functional wetlands because they're isolated. And that would actually serve to flush out contaminants that would make them available to nursery areas in the Bay.

MS. ADAMS: Site 1 and Site 2 would be -- I mean, areas around the runway that could be expanded into wetlands, which are in the OU2.

MR. BRADLEY: That's another good point. Sites 1 and 2 are just adjacent to the wetlands. Those are in Operable Unit 1, and I know we do have some samples directly from evaporation ponds that would be on the evaluation notes.

MR. HAAS: Keith, just as an aside for everybody, any wetlands creation or anything that a government agency does that is going to impact wetlands is also subject to a separate NEPA review. So these same kinds of issues would be visited in preparing the NEPA documentation for that kind of action.

MR. BRADLEY: In summary, the recommendations

for the sites on Operable Unit 2 are to pro ed to a Feasibility Study for Sites 8 and 9 for the reasons that we discussed before.

And like I say, the Navy will consider confirmation sampling for acetone and methylene chloride at Sites 8 and 9, but still, those sites, especially Site 9, had other contaminants that we advise remediation there, despite the methylene chloride.

Are there any other questions on OU2 before we proceed on to OU4?

MR. HAAS: I'd like to suggest, just to make sure we don't have someone beating down the doors, if on this presentation we can hold our questions until the end, and I think that will move things along a little.

MR. BRADLEY: The status of the Operable Unit 4 report is just like the Operable Unit 2 Report; it's a Draft. We'll receive comments from the regulatory agencies shortly, and then finalize the documents 60 days after that.

Operable Unit 4 includes the groundwater on the westside of the base. What that means is all the Aquifers, A through C. And that includes the runway and everything to the west.

It does not include the landfills. The landfills and then everything to the east of the runway will be addressed in Operable Unit 5, which is due this November 2nd, I believe, as a Draft report.

The data that's presented in this report is the Phase II RI data. And we've referenced some Phase I data, present it very selectively, but don't do a representation of that data. And we include Navy data and other data where appropriate, but not an extensive tabulation.

What we've done here -- for the sake of brevity, really, because we have these four big volumes already -- since we've already presented our Phase I data to the regulatory agencies and to the public, we did not reprint that. And since the other data that are available are already published in other reports, we also did not reprint that.

Now, we've had some comments that perhaps we should present some of the other data in separate tables, and where we can, I believe that we're going to do that.

We've done a couple of things here. One, is that we've presented statistics for the different sites and we've presented all this data in the back, and that's what that is. The data in the back is all

the Phase II data.

But what we've done statistics on is reflective of one sampling round. There was one sampling round that was conducted in May of '91, which was comprehensive sampling done in Moffett.

We've sampled all of the Phase I wells, all of the Phase II wells, some of the selected MEW wells and selected cleans wells all at one time, and put all of that data through the same analytical laboratory and put it all through EPA's validation process so that we got one very extensive and comprehensive snapshot at Moffett.

And so that's the data base that we used to present you our statistics on, and that's the data base that we used to draw our contours from, except that let me say on the contours, we also pulled other data from other places where it was helpful. We pulled data from MEW data, clean data that wasn't necessarily part of that round. We also used old data and hydropunch data, anything to help us fill in gaps, although we did not include that in the validated statistics presentation.

Rather than break this down by site, I've broken this down by aquifer. The good news here is that the B aquifers and the C aquifer are in good

shape. We found in each one of those, I think, one very low occurrence. And I think "very low" generally means less than five ppbs of TCE, I think, on one occasion in each one of those aquifers. But out of six samplings we didn't find it any other time, so we considered those to be not significant and, in fact, possibly not even existent. It was nonconfirmable. So that's the good news.

The rest of the news is not unexpected. I think it's what we've been talking about for years. The A1 and the A2-Aquifers both have an assortment of chlorinated solvents. A1 has TCE, TCA, 1,2-DCE, 1,1-DCE. And we also have, I think, the things of note up here are the PCE and the fuel contaminants, JP-5 and BTEX, in the A1-Aquifer. Methylene chloride again. Vinyl chloride we found in the A1-Aquifer, which is generally considered to be a degradation product of TCE.

Metals were found, obviously, but they were generally low and sporadic. We did not find any pattern of metals, which leads us to believe that they are likely to be naturally occurring due to just changes in lithology of the soils.

In the A2-Aquifer we found generally the same list of contaminants. We didn't find the vinyl

chloride. We didn't find the methylene chloride. Other than that, I don't see any real significant differences. Again, the metals were generally low and sporadic, which would indicate that we don't have a metals site.

MR. McCLURE: Keith, toluene is listed for the A2 but not the A1. Is that a typo?

MR. BRADLEY: Not that I'm aware of. I'm not aware that that's a typo.

MR. McCLURE: Is it in the BTEX set?

MR. BRADLEY: Jim, it's probably included in the BTEX. I just included that or threw that in the BTEX.

MR. McCLURE: All right.

MR. BRADLEY: Thanks. Your logic being the presumed source of the fuel contaminants are the Moffett sources.

Some significant findings from the RI Report. There appears to be significant mixing between the A1 and A2-Aquifer zones. Now that comes and goes. In some places the A2 is confined; that is, you have a good clay layer and it's confined. You'll have an upwelling of groundwater from the A2 to the A1.

In other cases, that clay layer is either very leaky or nonexistent and you'll have actually

downward movement. It changes very dramatically from area to area, as we have discussed before. That A1/A2 clay layer, it comes and go. In fact, those are very artificial designations, probably -- the A1 and A2 aquifers.

The chlorinated organic compound plumes in those two aquifer zones are very similar in extent; that is, the shape and size of the plume is very similar. Concentrations in the A2 Zone are generally higher.

TCE is the most widespread contaminant. It ranges from nondetectable 12,000 ppb in A1 and nondetectable 27,000 ppb in A2. The power to put down just one monitoring well and come up with those two numbers, I would say, they are more or less the same, the same order of magnitude, and I would not draw a big differentiation between those, but this is a general pattern that is higher in the A2 than in the A1.

Site 14, that's the Tanks 19 and 20 that have been removed for some time. That's the only site with significant and consistent detections of fuel contaminants. We did find occasional fuels in other places, but not significant.

We performed contaminant fate and transport

modeling. What we did is we started out with what we knew. We started out where the background levels of contaminants that were upgradient of Moffett sources and modeled our groundwater elevations and some constant physical measurements and compared that with our analytical data to see if it matched. We got a reasonable fit, and what it concludes is that our data seemed to indicate -- or our model correlates to a major upgradient source with an added minor source on Moffett.

And I think the word "minor" should not be misconstrued as insignificant. I think it ought to be construed as minor as compared to the upgradient source.

Our Risk Assessment Conclusion is that there is no current exposure pathways. That's because no one is drinking the groundwater.

Unacceptable risk could, however, result from drinking from either the A1 or A2-Aquifer zones. Most of that risk is due to TCE, rather than the other contaminants that were found.

Again, this is a very conservative approach, that is, drinking from the A1 or A2-Aquifer Zones because the yield is not going to be very much, but it does meet the state criteria for yield.

MR. SIEGEL: Again, did you look at all at the potential environmental impact of the plume moving in the wetlands or the Bay or is that something for future study?

MR. BRADLEY: OU6. We'll very specifically address the discharge of groundwater into drainages and directly into wells.

MR. HAAS: There has also been some additional investigations that will be addressed in the next presentation as a subject.

MR. BRADLEY: Our recommendations from this Operable Unit Report is that the Feasibility Study shows to address remediation in the A1 and A2-Aquifers.

And just like for the soils, the Navy is considering confirmation sampling of methylene chloride in the A1-Aquifer, although, really, the impact on remediation itself is not there because the same remedial technology will be used for methylene chloride as for TCE.

So are there any follow-up questions on OU4?

MR. McCLURE: Yeah. Keith, as you're probably aware by now, we have some serious reservations about a number of aspects of the OU4.

MR. BRADLEY: Yes. I got your memo over the

weekend.

MR. McCLURE: I'd like to ask you a couple of questions about the modeling first. We don't agree with the conclusions of the model, and I wonder if you could explain why, for example, you chose TCE and didn't run the model for any other compounds to determine whether or not the results that you got for TCE matched results for distribution for things like TCE, in which the effectiveness of the model would perhaps have been clearer?

MR. BRADLEY: I'd like to beg off on that and I'll tell you why. Like I say, I got your comments, your letter, over the weekend and I left it at the office for the person who did the modeling and our lead hydrogeologist to address. And I know that we'll be meeting with you shortly and we'll make sure there is a forum for going through each one of those specific comments.

Jim, I don't have really the specific knowledge on the modeling parameters to, I think, adequately address your question today.

MR. McCLURE: Okay. I have a question about contouring.

MR. BRADLEY: Yes.

MR. McCLURE: You mentioned that in drawing

the contours you drew on a larger data set in order to allow them to be refined and to take advantage of work that had gone before.

MR. BRADLEY: Right.

MR. McCLURE: I wonder if you could explain why not all, for example, the hydropunch data was used? And I'm thinking specifically of H29-100 adjacent to the western side of Hangar 1 where between, I think, 3 and 4 parts per million PCEs have been detected, but where you have shown the contours for TCE to be closed, and in effect, the concentrations to go to essentially zero in that location.

MR. BRADLEY: Don't know. Our intention there was to use all of the pertinent available data, and in lots of cases we used data from other sources that couldn't be confirmed. And we did, like you say, use hydropunch data, which are very different from monitoring well data. They're grab sample, they're not a monitoring well, but we used those generally just as information. It was additional information, and it helps when you're including validated data from approved EPA methods.

You can draw it that way, but really to get a better picture, if you pull in more data like geologic

data and hydropunch data, it just helps you, gives you more information. So generally we did that.

And if there are a couple that we did not include, you really would have to give me those numbers and I'd have to go find out specifically why we didn't include those, whether it was an oversight or that there is something specific about those hydropunch that we didn't think made it appropriate, and then I'll follow up on that.

MR. McCLURE: Okay. We would appreciate that.

MR. BRADLEY: Sure.

MR. McCLURE: There has been data available for some months now about TCE and other concentrations in the area of the northern boundary of Site 8 at concentrations in the order of 10 to 20 parts per million, and I wonder if you could explain why that data was not included in the contouring and why the RI, in fact, concludes that the northern most extent of the bulk of the plume stops by about Site 8?

MR. BRADLEY: Okay. Those data actually weren't available at the time we were writing this report. NASA had collected some samples up there and originally came up with these numbers.

In fact, Joe, is it your -- who's doing this

next presentation?

MR. LeCLAIRE: I am.

MR. BRADLEY: Is that part of your presentation?

MR. LeCLAIRE: We're going to present on the Soil Gas this time.

MR. BRADLEY: Well, Joe then, I guess, can address that.

MR. LeCLAIRE: I can talk about it.

MR. BRADLEY: Okay. But we have done some confirmatory sampling here recently. In fact, we just conveyed those data to EPA and the state agencies last week, so we do have some additional information we can give you on that. We can include those.

It turns out it probably will not -- in fact, the latest data shows that our conclusions on the extent of that plume was correct. It appears to be that NASA did find some other elevated levels but they appear to be -- we can't confirm that they're -- it's very large in extent and appears to be from another source north of Site 8.

MR. McCLURE: Will the RI be revised to reflect that discussion and that development of the data?

MR. BRADLEY: Sure. There's no reason not

to. It's available now and it wasn't before.

MR. HAAS: You've got to remember this is still a draft document and any information that's relevant can be included in the update, as well as the assumption that the Risk Assessment, et cetera, all of those are going to be subject to comments by the regulatory agencies. So what you're seeing is not a final version, by any means.

MR. BRADLEY: It's a long process. We've been writing the report for some time and several pieces of data have become available in recent months, so there's no reason not to include it.

MR. McCLURE: I appreciate that.

I wonder -- this is a question, perhaps, partly for EPA also -- whether the EPA comment process is likely to provide sufficient time in conjunction with your 60-day revision cycle to allow that information to be incorporated? I guess it's partly a question where the EPA revision or review process is and when their 60-day clock is likely to start.

MS. BLANK: Well, I think the comments are due Monday, so that 60 days would start June 1st -- is that what Monday is -- from June 1st.

MR. McCLURE: Is there any likelihood that that period would be extended as it is with some

regularity on many other Superfund Sites?

MS. BLANK: Which period?

MR. McCLURE: The review period.

MS. BLANK: The one that's just ending?

MR. McCLURE: Yes.

MS. BLANK: No. Not from our standpoint. I mean, I don't know what the Regional Board or state plans to do.

MR. McCLURE: I'm also curious about whether or not the existence of Sump 91 will be incorporated in the new RI Report?

MR. BRADLEY: Yes. We haven't shown a figure -- I'm not even sure we say anything about it in the text because we had just found out about it. I think we know a little bit more now and we'll enlarge on that discussion. And if there is any data available by the time we publish this thing, then we'll get it in there.

Surely, you can appreciate the challenges of finalizing the document while you're continuing to bring in new information. And like I said before, this is pretty typical, too. The process doesn't stop because the RI Report is finalized.

MR. McCLURE: I do appreciate the difficulties. And part of my concern is whether or

not we're being driven by an artificial clock to try to produce documents prematurely.

MS. BLANK: I wanted to ask you if I understood your question correctly. Were you asking whether our time frame for providing comments we were going to ask for an extension or whether the Navy was going to get an extension on its time frame for response?

MR. McCLURE: Well, either, actually.

MS. BLANK: All right. Well, I don't intend to ask for an extension in responding to the draft reports, but how the Navy wants to address this issue you're raising is another question, I think.

MR. McCLURE: Will the revision of the RI include the new Zook Road Site or any --

MR. BRADLEY: No.

MR. McCLURE: So there will be no discussion of that?

MR. BRADLEY: No. The RI deals with the 19 RI Sites and anything that's pertinent to those 19 RI Sites.

And the Zook Road -- well, the Zook Road Site, that's -- okay, that's the one just north of Hangar 1.

MR. McCLURE: Yes.

MR. BRADLEY: There won't be data available in time for that.

MR. HAAS: Yes. We don't know that the Zook Road is a site yet.

MR. BRADLEY: Yes. We don't even know if it is a site. The work is still ongoing.

MR. McCLURE: As an aside, maybe not so much for Keith but for the Navy, but the Zook Road Site, I understand, was identified by IT to the Navy in September or October 1988, and I wonder what the timing is that lead to its not being treated and completed in time to do the RI?

MR. CHAO: It wasn't identified as a site at all, even with IT. They, during their investigation, they found that there may be some contamination at the site. They weren't identified at the site per se. There are some aerial photographs or whatnot that was reviewed, and during the process, IT said that these three specific sites are possibly areas that happened to have some contamination.

And since then we have had further investigation, looked at other pieces of information, like other aerial photographs, reconfirmed them and relocated some of the sites. And during our last run of sampling we went out to investigate the sites, and

I don't believe the results are back yet.

MR. MARVIL: No.

MR. CHAO: Probably in about a month or so we should get the results back from that investigation.

MR. McCLURE: I'm not quite sure who to ask this question of, but I'm concerned that the boundary of the RI seems to be extremely narrowly drawn to the so-called site identified in the Initial Assessment Study.

In the correspondence from IT in 1988, I understand that there were anecdotal descriptions from Navy personnel that said that so much fuel was spilled on the road near the Zook Road Area that they had to close the road and they couldn't get through.

Now, it's the same material which has created other sites, so it doesn't appear to be any chemical distinction between what happened at Zook Road and what has happened at the Fuel Farm and other areas, but it seems that at that point the available information indicated comparable or higher levels of certainty that there was a problem.

MR. CHAO: Which information are you talking about?

MR. McCLURE: I'm talking about the descriptions that are in the 1988 correspondence from

IT, I think initially directed to Martin Marietta and then forwarded to the Navy, which I believe IT and Martin Marietta recommended that Zook Road and several of these other areas identified should be included in the program. In fact, I believe they were recommended for inclusion in the RI Phase I and Phase II sampling.

And I guess maybe this is a question for first, the EPA --

MR. BRADLEY: Jim, they weren't splitting up the processes.

MR. McCLURE: Is there any consideration being given to whether or not the bounds of the RI have been too narrowly drawn?

MS. BLANK: You know, this is an issue in any site you work on, and I think you have to -- at some point you have to work with as much as you have and bring that to an end point and then you keep adding as you go along in one fashion or another, whether it's the next RI or full-site RI. But it doesn't seem like -- if you just added sites forever you would never end up with the report.

MR. McCLURE: On the other hand, we seem to be generating reports drawing rather significant conclusions about the sources and distribution and the adequacy investigations to do remedial actions and

feasibility studies, which appear to be substantially incomplete in terms of their scope.

I understand, and I will admit anecdotally, that Sump 91, which has been reported to contain chlorinated solvents at the Dry Cleaners building, was actually discovered by the Navy last summer. It's only now being investigated.

MR. CHAO: No, that is not correct. It's now being investigated again. We investigated it one time.

Jim, you may want to jump in on this.

MR. HAAS: It was before my time.

MR. CHAO: We had summer hires go around reconfirming different sites around the area and it was noted to us that there was a sump there. At the time there was no -- in the sump itself it was dry. So there really wasn't anything even for us to sample.

And about, I guess, January or February, the time frame where they had the big rains and everything, there was more water found in the area. So they said, well, there is something to sample. So they finally sampled it. And that was the reason the sampling was done at that time.

It wasn't that we waited till now before we started sampling, it's just there wasn't anything to

sample at that time. We could have, I guess, maybe taken the sump out and sampled underneath, but as you know, our processes don't work that quickly to do anything like that. But then again, there wasn't any particular reason for us to act that quickly.

The previous investigations identified that the sump was an area that was a floor drain to the Dry Cleaner Area, more than the area like the other sump. They had a Dry Cleaners where specifically, I guess, the dry cleaning fluids or whatever was contained in that sump. There wasn't that information to investigate in that area.

I guess what I'm saying is there is a lot of information that we investigate that may not go into the final report, but we need to investigate it as part of the process where, like for example, your example of the fuel contaminants, where you go across the road where we had to talk to the person again and other people, other people of the Fuel Farm people that have been around for that time.

And they said -- actually the person that mentioned it was rather old, rather senile, and we really wouldn't be able to confirm or unconfirm what they say by -- I guess you can by doing actual field work -- but what he said should be taken with a

grain of salt because other people that were there never saw that quote, unquote, fuel that was across the road.

For example, the fuel across the road was very near like the hangar area where there were airplanes and everything else like that. So it was very unlikely that they would have this fuel just sort of let out in this area where they had all these airplanes taking off with high flammability and whatnot. So there are other facts involved here.

MR. BRADLEY: Jim, there are lots of areas that weren't IR sites that have been investigated; inferred sources 8 and 9.

Site 9 is supposed to be the old Fuel Farm and old NEX Gas Station. Well, you've seen the way that's expanded, just by Soil Gas Surveys. We've expanded that to 9(a) through 9(g) -- maybe (h), just based on soil gas hot spots just to see what the scoop was on those hot spots. So we've expanded that considerably in an attempt to make sure that we were complete.

Now, what the Navy has done, and what is just pretty much typical, is there will be some additional investigations in conjunction with a Feasibility Study.

I think what we feel is that we have the data to tell us what the contaminants are, what risk they present, and enable us to select remedial technologies identified and then screen them.

I think what we have, we have some areas where we need to gather additional data to do design. And perhaps even in some cases, we could actually figure out where the contour closes off.

You can't design monitoring wells -- or rather, the recovery wells -- until you know exactly where the farthest extent of contamination is. That's part of some of the work that we'll be doing as follow-up investigation. That's absolutely typical.

We have completely adequate information to know how to begin selecting remedial technologies while some other very pointed, very specific follow-up sampling is done to fill some data gaps for design.

MR. SIEGEL: I just want to address the issue of time table. It's very important to us that the time table not be slowed down in terms of developing remedies to resolve the issues between the responsible parties.

I know that those are important for them, but it's important for the public that the liability or the determination of sources not be used to extend the

comment period or anything which would slow us down.

We just had major changes in the schedule in dividing them into operable units to speed up the high priority areas, and I don't want to see us falling back into more delays to resolve those kinds of questions.

MR. BOSTIC: What you say is absolutely true, but if the sites aren't identified, then the groundwater extraction program, the opportunity for you to spread chemicals to uncontaminated areas is extremely high.

MR. STRAWN: What you have here is a lot of incomplete sourcing yet to be done. I mean, and yet you have a flat statement here from Executive Summary page 3 that says: "The main source of TCE present in the Moffett Field Aquifer Zones is the MEW Site."

Based on what?

MR. BRADLEY: Based on what?

MR. STRAWN: Yeah.

MR. BRADLEY: Based on comparison of groundwater contamination levels upgradient of the Moffett sources with those levels downgradient of the Moffett sources.

MR. McCLURE: Keith, it doesn't seem to us, to put it plainly, that you, the Navy, has in fact

acknowledged in one place all of its potential sources, much less investigated them. There are other areas identified in the Initial Assessment Study and the work plan that to my knowledge have never been investigated.

The ends of the hangars have been identified in the Navy documents as areas in which as many as, I believe the term "hundreds" is used, of drums that were historically stored, and where, in order to clean up the areas for routine weekly inspections, the pavement was washed down with solvent into the deck drains.

The fact that Sump 91 has only been brought to our attention in the last couple of months and is only now being investigated concerns us greatly. We're concerned that the extent of the source identification and investigation may be inadequate to identify sources in other areas.

And the concentrations that have been detected in the area around Site 8 cause us a lot of concern along those lines.

We are very concerned that Navy documents are still showing closed contours in the area of the western edge of Hangar 1 where hydropunch data, which albeit is not the same as monitoring well data,

indicate part per million groundwater concentrations.

MR. BRADLEY: I believe on the southwestern portion, which is the area of greatest uncertainty, those contours are dashed.

MR. McCLURE: They are dashed, but there are multiple contours shown extending down to the lowest concentration limit in the area where H29-100 hydropunch shows part per million concentrations.

I agree with your characterization of the practical impossibility of resolving all technical issues in a reasonable and productive time frame in an RI Report.

Our concern, however, is that there are such substantial uncertainties remaining about the existence and distribution of sources in groundwater that we have serious reservations about the effectiveness and practicality of implementing any kind of serious remediation.

MR. BRADLEY: If I implied that we think it's appropriate to proceed with this document because we're locked into a time frame, and that that's driving it, that's the sole reason, then I misled you. I didn't mean to imply that.

My intention was to tell you I feel like we are -- and I think we feel that we're ready to move to

a Feasibility Study with some additional investigation to fill in the holes where it's needed for the FS and remedial design.

MR. HAAS: Any other questions for Keith?

MR. BOSTIC: No, I have one for you, Jim. Are the transcripts going to be made available to those who want them?

MR. HAAS: Yes. The transcripts become part of the public record.

MR. BOSTIC: Okay. So copies could be obtained? Do I request these or what?

MR. HAAS: We're out of room in the library, aren't we, where those have been going?

MR. CHAO: We are in the process of moving some of the old documents from the library, some of the drafts, and we're going to be replacing them.

MR. BOSTIC: I'm speaking of this transcript. Is it possible to get a copy of this transcript?

MR. CHAO: We can get you a copy of that, Bob.

MR. BOSTIC: Okay. Fine.

MR. GULLAGE: Keith, my concern is, to go back to my earlier question about new data coming out of your investigations, and your answer was that it would be included in the Feasibility Study.

My understanding of the process is that a Feasibility Study is created based on a Risk Assessment and an RI. Now, the Risk Assessment, I believe, is a result of the information that's in the RI.

If the RI information is not complete and there is information known, a Risk Assessment is created that is based on incomplete data, and then the FS is started based on two documents that are not complete. And I don't understand how you can feed new information in at that late stage. I think it has to be available for the proper Risk Assessment to be issued.

MR. BRADLEY: I wouldn't say that we're locked into -- obviously, if significant additional information were discovered, I don't think that the FS would just pick up the Risk Assessment from the RI and say, well, this new information doesn't count because we've already done a Risk Assessment.

In fact, I don't think we have that option, and I'm sure Roberta wouldn't allow that. And I'm quite certain the Risk Assessment would have to be updated. The baseline Risk Assessment is presented in the FS anyway, so it would be updated to accommodate that new information.

And I think -- Roberta, you can help me out here -- but I assume, from what I've seen on other sites, that if we actually made it all the way through the process and came to a Record of Decision, and for whatever reason at that point significant additional information were discovered, I feel quite certain that EPA would reopen the ROD and require whatever was necessary out of the Navy at that time.

MR. MARVIL: In fact, that's what we plan to do in the Feasibility Study, is revisit the Risk Assessment and incorporate any new information that we might find in the meantime.

Just as a general comment to add to what Roberta said and reiterate what Keith has said, is the RI is just a step in the process, and it does contain a substantial amount of technical information which is adequate for beginning a Feasibility Study. There are some minor data gaps in the RI which we're currently exploring which will be filled in the Feasibility Study or subsequent documents, but I don't think it will impact the schedule in terms of major data gaps.

And then there is also a vehicle in the Remedial Design Process after the ROD is signed to further refine the conceptual model for the site and refine the alternatives or technologies or process

options which are selected to clean up the sites.

MR. CHAO: The Feasibility Study isn't going to be done based solely on the RI, because we do have some recent work and we'll have additional field work associated with the Feasibility Study before we continue with the Feasibility Study itself.

MR. MARVIL: And just to anticipate maybe the next question. The Feasibility Study is also a step in the process and it may not include all the comprehensive information about the nature and extent of contamination at the site.

The ROD can be reopened for Remedial Design documents and can include additional investigations to support the ROD.

MR. HAAS: Any other questions?

Thank you, Keith.

Moving right along. We got an extension here until 11 o'clock, but we do have to be out by then. That will be enough time to get through Joe LeClaire's presentation on the Additional North Base Area Investigations.

MR. LeCLAIRE: I think we can do this pretty quickly.

Just as a quick update, this is about the third time we've gone through this investigation at

these TRC meetings.

This is an investigation of the North Base Area and was all started when the EPA contracted URS to sample some existing wells, ten existing wells, and to install seven new wells and take some field probe samples in the North Base Area to try and determine the northern end of the regional plume.

The geoprobe samples and the seven new wells show that there are low levels of VOCs in the shallow aquifer zones in the North Area.

EPA then asked Navy, in an emergency response, to go out and confirm the geoprobe sample results and try and determine if there were any sources in the North Base Area.

We conducted the first phase of investigation last year. We put in 50 cone penetrometer and hydropunch samples at locations throughout the North Base Area.

Those samples did confirm the previous URS work. The recommendations were to install new wells, monitor the existing wells and collect some more CPTs and do water level measurements.

We've just completed the investigation. We installed eight CPTs, eight new wells in the A1-Aquifer Zone, five A2s, cone piezometers in the

shallow zone, soil gas near Site 8, that I think Jim was referring to. We did tidal studies and we did a limited survey of the storm drains in that area. And we also sampled the 191 Lift Station on the east side of the runways.

The field work was completed in March. The second round of sampling we just completed in April. The draft report will be out to the agencies at the end of June, and we'll finalize the report in the middle of August.

This map just shows the locations of the CPTs that were installed. The ones in circles are the CPTs and geoprobes that were previously installed. The white triangles were the proposed locations of the CPTs. The darkened triangles are the ones that we did install.

Not all of them are installed because of the inclement weather that we had this past spring. And what we've decided to do is not go back immediately and install those CPTs. The CPTs were just to look at the geology and see if there were any permeable channels for the rest of that area.

At this point we feel we have a good enough handle on the geology where those may not be necessary. If we find in conducting this report that

it would be good to get a couple more CPTs, we'll do this as part of the further investigations for OU4.

These are the locations of the monitoring wells and piezometers that were installed. Piezometers, I believe, are the diamonds. The A1 wells are the circles. And the squares are the A2 wells. And where you see a square and a circle together, like here at WNB-2 and 11, that's the well pair for A1 and A2. It seems clear we have fairly good coverage throughout the northern part of the runways.

Also as part of this investigation, I think the well that Jim was referring to was here on the north part of Site 8. This well actually was installed by NASA, and I believe the groundwater had about 10,000 micrograms per liter of TCE.

What we did was we went out and installed or took soil gas samples in these locations to see if we could determine a source in the soil. I'll present the results of that in a few minutes.

These are the results of the A1-Aquifer water level measurements. This is from the March 19th water level sampling that we coordinated with the MEW Companies, NASA and the Navy.

The thing of note here is that although the

gradient is pretty much to the north, that there is an influence from the Building 191 Lift Station and looks at the contours close in that area, and groundwater flow to the North Base Area seems to be predominantly to the east.

We will be going out again, I think tomorrow, for another round of quarterly sampling.

This graph shows the results of the Tidal Influence Study. These are three wells on the north end where we took continuous water level measurements with the data logger.

You can see that essentially that there is no response over time, so that there really is no effect of tides in this area. There was some concern that as the tides moved in and out that water may actually go to the south at some point, but it looks like there is no influence of the tides.

That graph is on a scale of feet.

This next one that you have is the same graph plotted at hundreds of feet, and you can see, again, that will really is no major influence of the tides except possibly at WNB-4, which shows a cyclical pattern of about 12 hours.

So there may be some small pressure influence on this well from the Bay, but again, if you notice,

this is only on the order of a couple hundredths of a foot, and this really has no influence on groundwater flow in that area or the gradients.

This is the preliminary results of TCE in the North Base Area from these latest rounds. This line here shows the detect/nondetect line that I think most of you have seen before. This is from the original North Base Area Investigation.

We had a hydropunch here, which is the reason why this arm of the plume, if you will, came out in this direction. This new well, WNB-6, has confirmed that there is indeed TCE in that area.

The other new things we picked up is that there are low levels in this area. Nothing that would be suggestive of a source, but possibly it's the influence of the 191 Lift Station, and the groundwater flow in this direction is probably to the east. So what has come down here which may be from storm drains, may now be flowing to the east towards Building 191.

MR. SIEGEL: Are these parts per billion?

MR. LeCLAIRE: These are parts per billion.

Beginning in about a month we'll be starting a Horizontal Conduit Study in which we'll looking at storm drains and sewer lines in the area to see if

those are preferential pathways for contaminant migration. This will supplement the work we've done here in the North Base Area and also the OU4 investigation.

MR. McCLURE: Joe, is the NASA well data shown on here? Could you point out the location of the NASA well.

MR. LeCLAIRE: That's not shown. It actually should be about right here, I think. But it is contained within this large area here.

And as Keith was saying, it does appear to be a separate source. We don't know what the source is. I believe -- Pat, you can speak to this -- I think NASA is conducting a further investigation of that area.

But the concentrations in this area are orders actually lower upgradient of that one well than what the well indicates. So it is possible there is another source there.

MR. MARVIL: Not only does it appear it be a separate source, but it appears to be very localized, based on the preliminary results of the Soil Gas Survey conducted by the Navy.

MR. LeCLAIRE: Let's skip one slide ahead and show the results of that survey. This is TCE in the

Soil Gas. The concentrations are micrograms per liter in air, so it doesn't correlate directly to water, but you can see that the values are fairly uniform throughout the area, which is really just about what you've seen in background.

There are a couple points that seem to be a little bit higher. There is a 0.2 here and a 0.2 here, but usually when you do see a source, either in groundwater and soil, you get orders of magnitude higher than what's in background.

So really, the Soil Gas doesn't appear to show that there is a source in this area. And part of that reason may be that clays are very thick and tight in that area and Soil Gas may not have worked, but again, there doesn't appear to be a source within this area.

MS. ADAMS: Were any soil samples, soil borings done in this area as of yet?

MR. LeCLAIRE: IT, as part of the Phase I, has collected soil borings and soil samples from wells on Site 8, but not as a part of this investigation, and none of those show that there was a source of TCE in the soil. That's in the Phase I Characterization Report.

MS. ADAMS: Okay.

MR. McCLURE: Joe, this says that the trailers are NASA Ames and Bendix. But are those trailers -- oh, I see, that is NASA?

MR. LeCLAIRE: Yeah. The property line is this fence here.

MR. McCLURE: The fence line.

MR. LeCLAIRE: The trailers do appear to be -- may have been used for storage or maintenance of electrical.

MR. HOGAN: It appears to be primarily a dumping ground for trailers for electrical/maintenance. It's not actively resided in or used.

MR. SIEGEL: The DRMO indication here, is that used for hazardous waste storage or other functions?

MR. HAAS: Yeah. In the past there has been some hazardous waste handled in that area. There have been, for example, used solvent tanks that were removed earlier in the process. And it was used some before we had the new waste facility further south.

MR. SMITH: On that last site you just had up there, what do you think the gradient is right there?

MR. LeCLAIRE: It should be pretty much to the north. If you flip back to your groundwater

gradient map or groundwater flow map, it's basically in this area. There seems to be a little glitch with the data. There is probably a well where the elevation wasn't properly measured, but until it gets up to past -- pretty much past the VTOL pad.

This is that area here where that well is, and this is the fence line right here. Until you get fairly far north of this, the groundwater gradient turns to the east, but through here it's pretty much to the north.

This last slide presents the results of the Building 191 Lift Station. It was a little bit surprising to us, we're going back out today to take a confirmatory sample.

There are four lines that come into the Lift Station. The Lift Station acts to drain some of the runways and some of the ditches throughout Moffett Field. There is a 36-inch line that comes in from the west. This receives drainage from both Moffett and NASA through the ditches and drains along Lindberg Avenue and Zook Road. Sometimes they are diverted across the runway at the 36-inch line.

There are other lines that feed into this line as it moves across the runway. These accept surface water from the runways through culverts, and

there is a possibility that there is some french drains that also feed into this line. These french drains would keep the groundwater level lower so the runways don't become flooded. This line does come in from the west and we measure the underlying concentration of TCE at 13 micrograms per liter.

There is an 18-inch line from the south that we're not quite sure exactly what the source is yet that had about 6 micrograms per liter of TCE.

Patrol/Marriage Road Ditch has come in from the east. The flow, when we measured it, contained no TCE.

Water from the two lines collect in a wet well, which is essentially the sump at Building 191. We measured the TCE and found it at 9 micrograms per liter. And discharge into the line going to the east was measured at 7 micrograms per liter. And again, we're going out for confirmatory sampling today.

Again, the results from the second round of sampling should be in in a few weeks and we'll have the draft report to the agencies by the end of June.

Any questions?

MR. HAAS: Ordinarily, I would encourage people to stay and meet after the meeting. There may be some opportunity to do that out in the parking

lot, but I hate to rush everybody off.

The next TRC meeting we're going to attempt to schedule for August. At the same time we'll be due for another open house, probably sometime in August. We're planning right now on changing the format for the open house and turning that into more of a community meeting with a formal presentation and changing the hours to the evening so that more people in the community have the opportunity to attend, but there will be more information on that coming out during the next few months.

And again, if anyone has any specific agenda items that they would like to have the TRC address at the next quarterly meeting, please feel free to contact me or Su Don Tu on my staff -- Su Don, would you stick your hand up -- any time during the coming months.

And thank you very much for your attendance.

[The May 27, 1992 Technical Review Committee Meeting was concluded at 11 o'clock a.m.]

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COUNTY OF MARIN)
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I, SUSAN M. REINHARDT, do hereby certify that the foregoing transcript was reported in shorthand at the time and place therein stated. I further certify that the foregoing is a full, true and accurate transcription of the proceedings to the best of my ability.

I further certify that I am not of counsel or attorney for either or any of the parties named in said action, nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal of office this 11th day of June, 1992.

Susan M. Reinhardt

SUSAN M. REINHARDT

OFFICIAL SEAL
SUSAN M. REINHARDT
NOTARY PUBLIC - CALIFORNIA
MARIN COUNTY
MY COMMISSION EXP. AUG. 21,1992