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REMEDIAL PROJECT MANAGERS' MEETING

NASA/JET PROPULSION LABORATORY

ROOM 108-801

25 August 1995

ATTENDEES:

Peter Robles, NASA

Charles L. Buril, JPL

Judith A. Novelly, JPL

Debbie Lowe, US EPA

Jon Bishop, RWQCB-LA

Penny Nakashima, DTSC

Stephen Niou, URS

B.G. Randolph, Foster Wheeler

Mark Cutler, Foster Wheeler

Vince Richards, Foster Wheeler

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Reported by Louise K. Mizota, CSR 2818

RPM MEETING AGENDA INDEX

Pasadena, California

August 25, 1995

9:25 A.M.

ROBLES: This is the 25th of August, 1995, and this is our Quarterly Superfund RPM meeting.

BURIL: Let me suggest that we go around the table just for a quick second and have voice recognition for the folks who might be listening to this tape in the future.

Speaking right now, this is Chuck Buril from JPL.

LOWE: Debbie Lowe, U.S. EPA.

NOVELLY: Judy Novelly, JPL.

NIOU: Stephen Niou, URS.

BISHOP: Jon Bishop, Regional Board.

NAKASHIMA: Penny Nakashima, Department of Toxics.

RANDOLPH: B. G. Randolph, Foster Wheeler.

RICHARDS: Vince Richards, Foster Wheeler.

CUTLER: Mark Cutler, Foster Wheeler.

ROBLES: Peter Robles, NASA management office.

Does everybody have an agenda with them?

BISHOP: Yes.

ROBLES: What we'll start with is the project

overview by Foster Wheeler.

BURIL: Right. The way we have this set up is we're going to ask Foster Wheeler to go ahead and present the data that we have thus far and our evaluation of it thus far. We'll present that by operable unit, and we'll start off with Mark Cutler, who is the Operable Unit 1 manager.

CUTLER: We were looking, or Judy was looking in the minutes for the last meeting, and it was requested we talk a little bit about geology and water levels and water chemistry. So we're going to give you a real brief rundown of some of these. If you want some more details we can go into it later.

So we'll start with the geology of JPL. Real brief, this geologic map of JPL is basically from the California Division of Mines and Geology, pretty much superimposed on the site. It's very tough to map these fanglomerates the way the site is now, so we relied on existing data. These cross-sections, they're not all up here. This is cross-section B-B prime, which runs through here, and A-A prime, which runs up through here, just as a representative of what's on site.

These formations, these fanglomerates, Pacoima formation and Saugus formation, are mapped

pretty much basically on regional data. There is a fanglomerate outcrop up behind JPL. We know the thickness. The Pacoima formation --

BURIL: Do we have it on the aerial photograph there?

CUTLER: No. It's up behind the mesa. And the same with the Pacoima formation. Its thickness, it's about 90 percent exposed up behind in the mesa here. This is Pacoima formation here. So we have an idea on the thickness.

During our drilling we can't tell. The difference between Saugus and Pacoima is a few different class types. And in mud rotary everything comes up all beaten up into little chips. You can't identify rock types. So this boundary is very hard to see. This is a little reddish stained unit or formation. We didn't really notice it during our drilling. We do notice a general fine downward sequence and we do see that in our logs.

The main features, structural features on the site is the basement. We hit it out here in Wells 3 and 4 at around 600 feet. And there is a boring put in right near our Well 7 that went to 800 feet and never hit basement. So crystalline basement dips into the mountain.

There again, the only other real structural feature is this thrust fault, the JPL thrust fault, which is mapped here. There's real good control over here. There's a trench. JPL did a lot of studies in the early days to identify and map this fault. There's a trench here, a trench here. All these borings were put in to try to identify the fault. So there's real good control here. Up behind Building 150, which I don't know if you can see it. Here is 150. There's an actual outcrop.

BURIL: Why don't you point it out on the map here.

CUTLER: Here is 150 up here, this little splay. You can walk up there and look at diorite sitting on the conglomerates.

Over here, the fault is less well defined. It's pretty much just the base of the mountain. So it's pretty well dashed over here.

There is at least 800 feet of throw on it. And we don't believe there's any real significance as far as aquifers up here. This is sand faulted against sand. And there's been no indication of groundwater stain up there. When it rains, of course, water will come and, we feel, just kind of

cascade off.

Any questions?

BISHOP: Looking on the left side, I guess, or the northern side of the fault there.

CUTLER: This?

BISHOP: Right. Exactly. You show the glacier or gl, whatever that is.

CUTLER: Leucoratic granodiorite.

BISHOP: And you have some borings there. You've gone down and found that --

CUTLER: Right. These borings, we haven't actually drilled north of the fault other than some soil borings. B.G. told me he thought maybe they hit base in one spot. It might have been a big boulder. These borings that go into it, they tried to penetrate it and they actually did penetrate, go through the fault on a few borings. All these up here were installed to try to find the fault, to try to find this little ledge here. And that's how we have such good control up through here on the fault. We, Foster Wheeler, haven't actually done that. A lot has been done already.

RANDOLPH: Mark, what we did in two holes up along there in our soil borings, we did get some pretty good size chips of material that it looked

and appeared exactly like what we're going to -- the big rock outcroppings just upslope, which I think pretty much, we were in basement.

CUTLER: Was that more over here?

RANDOLPH: Right up behind, by Buildings 97 and 197.

CUTLER: Yes. Right up in here. And there's pretty good control on the fault. There's a trench right in here. They looked at it and mapped the trench. We have all that documented.

Water levels. What we've done since September '92, we have had pressure transducers in all the shallow wells on the site. And we've been getting daily readings. So we have a ton of groundwater level data. In the early days we were getting six readings a day. Now we're down to two a day.

I hope you can see this. This is just a general overview. This is the hydrograph from September '92 up through February '95.

BURIL: Just as a note, I think we provided that hydrograph at the last meeting. Something similar to that.

CUTLER: Could be. But the basic idea, when we started this project, it was some of the drought

years. We had almost a 100-year storm. Water levels just dramatically rose. They turned on -- the City of Pasadena has their pumps, the Arroyo Well 52, and the Ventura Well.

Immediately draw down up to 40 feet in a matter of a few days. Well 6, about a half mile away, water levels fell 10 feet in a matter of a few days. So this is a huge cone of influence from these production wells. They shut the pumps off, boom, immediate rebound. Goes along pretty normal. Then they turn their pumps back on, long draw-down. This is in September '94. They turn the pumps off, then back on and off. This other data we just haven't plotted out.

The basic idea, though, is we've seen water levels change over 90 feet.

BISHOP: Which well is that the graph for?

CUTLER: It's for all of them. Except for -- this big dark line is from well MHL 1, which is closest to the pumps. So it has the most dramatic changes.

BURIL: Any of the wells that are multi-port wells don't have the transducers in them. It's just the standpipe wells.

CUTLER: Two wells that aren't on this

hydrograph are these wells up here, which you'll see later. This is a large groundwater mound. The elevations are so much higher that they're plotted on a separate hydrograph.

The interesting thing about this is - I lay these out - when they turn these pumps on, we don't really see any reaction to these wells up here. We'll talk about this more. This is Well 1 and 9. It takes a while. Then all of a sudden there's some type of breakthrough these pumping wells. The screens are deep, very high draw. Then all of a sudden we see drawdown up here on this huge mound. Then when they turn the pumps off on the same day, they all react the same. So there is communication between this mound, which I'll show you in a minute, and the rest of the formation, or the rest of the aquifer.

Any questions? Okay.

We've related a lot of these water level rises to rainfall and spreading ground data. So we have all this, you'll see.

BURIL: We have some of that from the last meeting as well.

BISHOP: Maybe I wasn't at the last meeting. Was I not?

BURIL: I thought you were.

BISHOP: I don't remember getting this.

NIOU: Could we have a set of the water level, then?

BURIL: Sure. It's not a problem.

CUTLER: Just to give you a feeling, what we have here, we put together contour maps of every sampling event going back to 1990. We've sampled at this site actually 13 times. I was going to briefly show this to you.

BURIL: Mark, we have some of the groundwater contour maps here. You might talk a little bit about those. I know we gave these to you. But you might refresh memories about the groundwater contour maps.

CUTLER: Right. That's what this is.

BURIL: You got both of them on here. Great.

CUTLER: Right. I think it's in August '93.

This is just to give you an idea of what the conditions are on the site and how they change. As you'll notice, there is always a large mound right at the mouth of the arroyo. This is about a 100-foot high groundwater mound right here. When we first started, things go to the east.

It stays pretty consistent. Then all of a

sudden, this is April '92, we had a complete reversal across the site. We still have a large mound, but flow is going to the west. There's a small mound here, we think. There's a large storm drain system that empties into the arroyo right here and we think it's creating this subtle mound.

Then flows go back to normal again for quite a while. Then we have - this is March '93 - another complete reversal across the site.

Then we get some strange things where we get kind of a mound where there's like a ridge across the site, some reversal. The region is starting to come back.

Same here. It's kind of in the process of reversing back, if you will. And then, of course, back to normal during the RI sampling events.

That's basically it on water elevations and flow directions, just to give you a brief idea of what's going on.

What we have also done is collect major anion and cation data on the site with all these events. This is going to be hard to see. This is from the first RI sampling event.

We've created stiff diagrams for all this water chemistry, and there's three basic water types

on site. There is a potassium carbonate water type that is only found in the lower screens of the deep wells. I don't know if you can see it, but potassium is this uppermost cation. It's the dominant here, over here, over here, over here. Right here might be kind of a combination water type. But it's only found deep.

Then the most common water type is a calcium bicarbonate water type, which has this kind of a signature, which is found mainly in all these shallow wells over here, Wells 7, 16 and 13.

Another water type, this is probably the best example, is a calcium bicarbonate, but it has elevated levels of chloride and sulfate.

That water type is mainly found in Well 6, the upper screens of 14, and it has come and gone in Wells 10 and 5. So in a way we feel this is more representative of up-gradient water coming onto the site. The calcium bicarbonate water is more representative of maybe water coming out of this huge mound and getting onto the site. And of course, the sodium bicarbonate is the deep water type.

These water types don't change too much. Sometimes one screen in one of the deep wells will

change from one sampling event to another. And occasionally in Wells 10 and 5 we see changes between the calcium and the chloride sulfate type waters. I'll show you later after we look at some of the contaminants how that's related to flow directions.

Let's go into contaminants. The only metal that we have found during the RI in the groundwater is chromium above an MCL. That's in Well 13. It was found in the first sampling event in June above the MCL. In the second sampling event it was found at about half the MCL but hexavalent chromium was found. So there's really no metals except for chromium in Well 13.

The VOCs, there has only been three VOCs found in the groundwater above MCLs. And those maps that are in your handout, there's contours on them for the November sampling event.

BURIL: In this little additional thing here were the rough drafts that had both June and November sampling events.

CUTLER: Right. Basically, those three contaminants are carbon tetrachloride, TCE and 1,2 DCA.

As you can see for carbon tetrachloride,

that's the highest concentrations of contaminants. And it's centered around Wells 7, 16 and 13. Levels get up to around 200, 300 parts per billion.

What we find, when you look at these maps, one thing we need to point out is these three wells up here are shallow wells. It's detected in high concentrations. It's only detected in the second screen in Well 3 and the second screen in Well 4. So it appears to be sinking as we head to the east. Well 8 is a shallow well. If you draw a line from the second screen in Well 3 to Well 7, Well 8 is above that line. So these contour maps basically ignore the concentration in Well 8. It would be just like if we just took the upper screens in Wells 3 and 4. It wouldn't be truly representative. So when you look at these maps keep that in mind, that we believe Well 8 might be above existing contaminants. So it's conservative in that direction.

The TCE concentrations, it seems to be centered around Well 13. It seems to have had the highest concentrations. But overall, it's very, very similar to carbon tet.

And 1,2 DCA, there again, it seems to be centered around Well 13. There's not much there,

but the MCL was .5 so it doesn't take much to get over the MCL. And it's fairly similar. A little bit smaller in areal extent than TCE and carbon tet.

The one thing you may note if you look on the contour map for TCE, there is some TCE found in Well 10. And we have interpreted that at this point to be a separate source of TCE. There's actually several reasons we think that.

First of all, just looking at the map, it's in the upper screens up here. It's in the second screen in Well 4. The second screen is about 250 feet deep. Well 10, the screen in Well 10, the bottom of its screen is about 150 feet. So for TCE to go here to get into the second screen here, you would literally have to go back up to get into Well 10. So that's just one suggestion that there might be some disconnect here.

The other thing that's actually pretty interesting is it gets back to water chemistry and flow directions. This might be tough to see.

BURIL: Do you have more of those, Mark?

CUTLER: No. We can make more.

This is a basic plot of total VOCs in Well 10, and down here is water type. Well 10 we didn't start sampling until event 8 because it wasn't

existing during these previous events. But when we first sampled it -- here is Well 10. When we first sampled Well 10, it had the calcium bicarbonate with high chloride and sulfate, this up-gradient water type.

Let me get the flow map. This all ties in.

During event 8, flow was from the west. We have the up-gradient water types and we had high VOCs, which is mainly high TCE.

During event 9, we had a complete reversal on the site. We had a stiff diagram. There's more calcium bicarbonate, more of this water type, so flow is going this way. We had the water type representative of basically coming from onsite, and total VOCs dropped off.

The same for the next two events, these two events. We had that same water type. We also had flow reversal. Let me just show you in case you don't believe me.

Here is event 10. Flow reversal. And event 11, still a flow reversal.

Here is event 12, which is this event. You go back to the chloride sulfate-rich water, representative up here. And we had back to our

normal flow from the east.

And event 13, same thing. Water type, concentrations and flow directions all tie together.

So based on this, we think this is from an up-gradient source. The water chemistry is an up-gradient chemistry. Flow directions say it's coming from up-gradient. And yet it's not related to the onsite.

BURIL: One final point on that is if you have an opportunity I can take you folks out and show you. Literally standing from here we can see the Valley Water Service Company well locations, which are -- Mark, do you want to put up the OU-3 map for a second? It's right next to you.

You see the red dot on the far left-hand side near the Flintridge School for Boys. That's the location of the Valley Water Service wells, approximately. They have a known PCE contamination problem, and they have experienced TCE contamination there as well. Their PCE concentrations are literally orders of magnitude higher than the MCL. They have a treatment system in place already.

Now, the interesting thing about looking at PCE as opposed to TCE for the time being is that PCE is not a problem here on site. We have found

very little, if any, PCE whatsoever here at JPL. So I think that adds even more credibility to the idea that there is potential off-site influence coming onto --

BISHOP: But 10 didn't have PCE. It has TCE.

BURIL: That's what I'm saying. There is TCE there too. I'm saying that you've got this influence up there. There is known contamination out there.

CUTLER: Of course, we've proposed a couple wells between the TCE here and the TCE there to try to expose those.

LOWE: Where do you suspect this is coming from if it's missing MW-6 and MW-14?

CUTLER: I don't know. It's just coming from somewhere over here. There's a lot of possible different sources up-gradient in La Canada. I don't know.

The other thing, we see the same kind of relationship, not as dramatic, down here in Well 5. This is the same type of graph for Well 5 where we have water types and then total VOCs. The early 3, 4 and 5 sampling events we had this up-gradient water type in Well 5 and we had higher concentrations. Since then it's all been this

calcium bicarbonate water, and concentrations have basically dropped off.

LOWE: What were you finding at MW-5?

CUTLER: Same thing. TCE, primarily.

LOWE: How high?

CUTLER: Not very high. One event it got up to -- I think it was 86. This shows over 90, but there were a few other things in it. 86 parts per billion was one event, and the rest of it were down between 10 and 20.

BURIL: What were the higher concentrations that you saw on site, Mark, do you recall, for TCE?

CUTLER: On site up in here I believe it's around 50.

BURIL: So even higher than we've seen previously.

CUTLER: Right. From this one time in Well 5.

NIOU: TCE, the new one is 43, and at MW-5 seems TCE and carbon tet, you don't see anything.

BISHOP: This is only for these two sampling events, though. They've got 11 other sampling events.

NIOU: They're also talking about other ones.

CUTLER: Right.

BURIL: Right.

CUTLER: Overall trend, this is -- I didn't bring all the figures we have. This is a general indication of it. There seemed to be an overall trend. You can see this water type in Well 5 go completely to calcium bicarbonate. The concentrations in the second screen in Well 3 seem to be decreasing with time. And the concentrations in the second screen in Well 4 seem to be increasing.

So it seems overall, with all the rains we've had in the last two, three years, a general slow migration, maybe, of low levels of contaminants this direction. When we see these reversals we don't see all of a sudden concentrations going up over here as a big plume moving off site and they go back again and have things come back. It seems to be a very slow, very subtle thing. These flow reversals are just short duration, relatively speaking. It's probably more of this yearly upper level water changes that's smearing things around.

BISHOP: In terms of that -- do you have an indication on the velocity? Do you have anything to get some type of --

CUTLER: We do. I have it in some notes. We have some aquifer testing. We've calculated some

flow rates. Relatively low.

BISHOP: So it would seem if you had relatively low rates and you've got this reversal for short periods of time it's really not going to move things very far before it comes back again.

CUTLER: It ties in. That's really what we see. We don't see things just heading in the other direction.

We do see, speaking of those aquifer tests, the tests from the wells in this area here have really low transmissivities compared to the wells over here. That might somehow be related to this large mound we see over here. Then this mound is relatively isolated from the deep pumping and there's a little bit of lag time.

BURIL: Mark, are the soils in that particular area in the northeast portion, are they a more fine-grain soil in comparison to the others, or are they about the same?

CUTLER: When we were logging it, to be honest with you, we didn't notice much difference.

Okay. That's basically it. That's a general overview.

BURIL: Okay. Thank you.

I think one of the things that's

interesting when you look at these, look at the rough ones here, you have the June in comparison to the November. I think, Jon, one of the points I think you were trying to make is it's slow movement of things. I think that's almost borne out by looking at the size and shape of these contours in a general sense. Very similar in size, very similar in shape. The concentrations change within the contours to a certain degree. But the overall pattern appears to stay pretty much constant in terms of its real extent and overall shape.

So I think that supports one of your thoughts, I think, to a certain degree, is that you're not seeing huge influxes of water that create a massive shift in contaminants. It is slower and the process is, by being slow, allowing this thing to stay a little more constant, a little more uniform than what you might otherwise expect in a very dynamic kind of situation.

Any other questions? We'll go on to Operable Unit 2 if you don't have any right now. We could always go back, of course, if something comes to your mind as we're going through it.

B.G., do you want to walk us through Operable Unit 2.

RANDOLPH: Operable Unit 2, by all rhyme and reason, is considerably much more simple than OU-1 by many magnitudes.

At the time that we had the Northridge earthquake we were putting in a bunch of soil vapor probes, about 57 of them, over the entire Lab, most of them concentrated in the north and northeast sections. We also have some isolated areas down here around Building 306. And then we put in one over here at MW-14. MW-14 hadn't been drilled at that time.

That's all these little green dots. I know they're hard to see, but they should be on one of the handouts that you have under OU-2. And the soil vapor results that we have are also tabulated. I'm pretty sure we gave those to you several RPM meetings ago in rough form.

BISHOP: Can I ask a quick question? The first diagram is the locations of the vapor probe?

RANDOLPH: I'm not sure exactly how you have them arranged in yours.

BISHOP: I'm just trying to follow it. We've got soil vapor well location.

RANDOLPH: That's just the wells.

BISHOP: And then you have the detections. So

those are wells and probes?

RANDOLPH: Those are the probes that were done.

BURIL: B.G., explain the difference between the two a little more.

RANDOLPH: The probes that we've put in were either done by hand or with a unit which hydraulically shoved a probe into the ground. Our target was as deep as we could get, but a minimum of 30 feet, if we could get it, to make sure that we were down below the bottoms of any of the seepage pit areas that we were in.

There was only one sample or one sampling time during those probes, that was on the initial survey, to see if we were going to hit any hot spots or so-called hot spots in order to meet the criteria of putting in a soil vapor well where the total of concentrations of VOCs within that soil vapor sample exceeded 1 milligram per liter.

When we went through the results from that initial survey, it was proven, and you were all given the total concentrations and the types of compounds that were found in each soil vapor sample, which they were all well, well below that 1 microgram per liter limit.

BURIL: Milligram.

RANDOLPH: Milligram. Excuse me. Milligram per liter limit, which we were going to use as a criteria for installing soil vapor wells. Initially we were only going to have two wells, but under the assistance or I should say --

BURIL: With their help.

RANDOLPH: -- we were forced into installing --

NAKASHIMA: Recommendation.

RANDOLPH: -- soil vapor wells into every soil boring that we were going to drill during the RI, which meant 24 wells instead of 2.

Later, during the installation of the soil vapor boring -- or during the soil boring program --

BURIL: Now, the green dots that you're folding back on the overlay were the initial soil vapor probes.

RANDOLPH: Those were the initial soil vapor probes.

Now, at each of the red dots were the locations of the seepage pits or dry wells that we could identify during our initial investigations and research of the Lab.

The yellow dots represent soil borings that we drilled and in which we placed soil vapor wells, which is nothing but a tube attached to a tip

placed at various depths and sealed off from one another by hydrated bentonite chips, and each tip has got sand a foot below and a foot above. There are anywhere from two to five probes or sampling points within these soil borings, depending upon the depth that we were able to drill.

BURIL: B.G., how many points do you think you actually hit bedrock in the borings? Do you have a feel for that?

RANDOLPH: I'm sure we did in 13, 14 and 17 for sure, right up here, that we actually got into bedrock, which I am very, very confident that we did.

9 and 10, over here, we were basically able to go the full distance. And it's not very far between 9 and 10 and 13. So we've got a shelf or something running through here. It drops off tremendously to a depth of bedrock.

Also, over here in soil boring 8 at the site of an identified, supposedly or alleged dumping area that existed back in the '50s, we went to 100 feet and didn't get any bedrock. And I believe there are five tips or sampling points in that particular soil boring.

You can see that the soil vapor wells and

all the soil borings are concentrated again in the north and the northeast areas of the Lab. We stopped our depth above the groundwater table and all the holes over in this area that we knew there was shallow groundwater or it was shallower than the 100-foot target depth for the rest of the soil borings.

And basically, the soil vapor, the VOC soil vapor content is higher in this area, as we would have thought and believed from the past, based upon the preliminary analyses that are shown on these other three sheets here. They have some of the soil vapor pits. The contaminants that were listed, chloroform, TCE, PCE and TCA. There should be one here of some carbon tet. Yes. There it is. And basically those areas of hits were concentrated in the northeast area.

Now, we have taken two rounds of vapor samples from the time after they were installed in the soil borings. We completed everything, the installations around the end of October and the backfilling of those bloody half-inch PVC pipes. And we made our first round. It was in the last part of December, a week before Christmas and one day after Christmas that we took the first set. The

next set was in March, about one week better than two months apart, as planned and stipulated in the work plan and FSAP. And we found a slight increase in the area of detects, and they were basically at deeper depths than we were able to get with the probes. And some of the areas where we had no detects with the probes, when we got down deeper we were able to pick up some VOCs in the soil vapor with the wells.

There are two graphs that you have, one showing the number or the range of VOCs.

BURIL: That's this one here?

RANDOLPH: For the individual samples, for the total number of samples that we have, which are 260. It shows the highest concentrations along the bottom of the graph versus the percentage of those ranges for the total number of samples that were taken. As you can see, we had around 34, a little better than 34 percent non-detects, on up to -- no sample had greater than 300 micrograms per liter of VOCs in the sample. I believe that because of the ranges, being from 250 to 300, I think the highest we have was right around 260 or 270, in that particular range, of total VOCs in micrograms per liter.

The cutoff range for any kind of action

as shown in the FSAP and the work plan was that we were going to really plan action if it was over 1 milligram per liter. We have not received or reached that point in anything.

BISHOP: Right.

RANDOLPH: The next chart.

ROBLES: Question.

BISHOP: I did notice that in the work plan, and I'm sure it's in the FSAP also. And it did reference the Regional Board. But it referenced total VOC in terms of just the composite.

Is there any other place it talks about the difference between carbon tetrachloride being 10 times less, the action level being 10 times less?

BURIL: No. They just address the total concentration of all VOCs added together.

RANDOLPH: On the second chart, this shows both rounds of the sampling from the vapor wells. The previous chart I showed you also included the initial survey. These are just well samples. And the highest concentration of total VOCs that we had in any of these was just slightly over 400 in the second round of sampling in one well. And these are shown per well, by well for each round. It's also tabulated in a table for you.

LOWE: Do you have any theories for why there were more non-detects in round 1 than there were in round 2?

RANDOLPH: Well, yes, because the probes can't get as deeply as the wells. Some of those are only 5 feet, 6 feet, 8 feet, where in the total depth of the wells we went as deep as we possibly could go, which is up to 96 feet.

LOWE: You mean round 1 and round 2 you weren't sampling the same wells?

RANDOLPH: Oh. Excuse me. No. No. The soil vapor moves.

BURIL: The only thing we can think of --

RANDOLPH: You have atmospheric pressure.

BURIL: You have the combination of the atmospheric pressure, the changes in the groundwater elevation and so forth. Pumping the vadose zone to a certain degree probably changed the distribution slightly, which is why we see things changing around. We would probably see that if we would look at it over time.

I think the thing that's most interesting about this is that the preponderance of the data shows that we're under the 100 microgram per liter number when you look at just the individual points.

Then when you look at everything added together for an individual well, we're still way below that cutoff of 1 milligram per liter VOC. So, yes, it's a telling kind of thing. It doesn't look to be that big a problem in terms of soil vapor for Operable Unit 2.

BISHOP: I'd like to jump in here, because I think that 250 parts per billion of carbon tetrachloride increasing with depth is a significant problem, is not a minor issue, because that's where your center of your groundwater is contaminated with carbon tetrachloride. You've got increasing depths in the soil vapor at that area. You've got one well, soil vapor well right in the middle of the -- if you look at your plume on top of your vapor probe locations, and I'm just going to pick this one, it's carbon tetrachloride. I think your thing is right about just south, right in this area somewhere is your Vapor Well 16.

RANDOLPH: Right here.

BISHOP: If you look at your carbon tetrachloride plume, it's just about the middle of your highest groundwater area.

BURIL: You said Well 16?

BISHOP: Vapor Well 16. I think it goes to 95

feet, I think is the depth of that. The highest level that you detected was at 95 feet. It increased as you went down.

BURIL: I'm trying to find that. Unfortunately I can't see that. There's the soil samples.

NAKASHIMA: I think I saw it.

BISHOP: I think I took it out because I was looking through them.

Here it is. So 4 and 16. Okay. If you go down the --

NIOU: 239.8 at 95 feet.

BURIL: You're looking at boring number 16?

BISHOP: Yes.

BURIL: Okay. I got you. And you're looking at which one?

BISHOP: 16.

BURIL: 16. 95 feet. Okay. I see what you're referring to.

BISHOP: 60 you've got 8, 10, 8 or 9. 80 you've got 170. I can't really tell, but it's somewhere in the 100 something. Then you go to the low 200s at 95.

Now, I may be wrong about this, but looking at the other information, we've got water level about 200 feet there. So you've got another

100 feet of unsaturated zone between this increasing concentration and the water level. When you get to the water you've got the highest area of carbon tetrachloride contamination in the site. And the only indication, source indication you have is that one well at depth.

To me it seems like that's an area that ought to be a concern for OU-2. Is that source just very confined right there? Is it larger? Does it still continue to increase with depth?

BURIL: Boring number 16 is where on the map, B.G.?

RANDOLPH: Right here.

BURIL: And is it a continuing source to your carbon tetrachloride to the groundwater?

ROBLES: I have no problem with it. The key is we've always said we have a source in the middle of the facility. We just need to know how far down it is.

BISHOP: My concern, or what I think needs to be thought about that is, is that source still continuing to contribute to the groundwater? The look as it increases with depth, your shallow zones may or may not have been because it's already moved beyond or more likely the source was below that, if

you had a dry well or something.

But is it increasing as you go down? Is it continuing to increase? You've got another 100 feet of unsaturated zone that may be increasingly contaminated or getting more and more saturated with carbon tetrachloride until you hit the groundwater.

Is it more expensive to pull that out of the groundwater or to pull it out of the soil? In our experience, it's a lot less expensive to pull it out of the soil than to wait until it gets all the way into the groundwater and then start pulling it out.

ROBLES: The only problem is we've got a building right over it.

BISHOP: Well, I think there are some --

BURIL: It's one of those minor details.

BISHOP: It seems to me that 16 is right in the middle of a parking lot, though, right?

RANDOLPH: That's along the side of a very narrow roadway.

BURIL: Isn't that right on the edge of a hill there, too, B.G.?

RANDOLPH: Yes. There's a pretty steep slope right behind it coming down. These buildings that have been demolished in here were on the slope.

ROBLES: Is your suggestion to go down 100 and 200 feet and take out the soil?

BISHOP: No. I'm not saying dig out the soil at all. I'm saying it may be worth looking at the cost of vapor extraction as opposed to groundwater cleanup in that area. But to do that you're going to need more information than one probe to 95 feet.

ROBLES: That's true.

BISHOP: Our experience at the Board has been if you can get it out of the soil it costs so much less than to pump that groundwater forever. If it's still contributing, it's adding money all the time.

So I would consider that before determining the OU-2 doesn't have anything that needs to be addressed.

ROBLES: To determine if we have a source there in the vadose zone.

BISHOP: You have a source. We don't know enough to say if it's enough to be continuing to contribute or --

ROBLES: And then the suggestion is to use vapor stripping or some technology to take the contamination out of the soil. The source.

BISHOP: Yes.

BURIL: Let me ask you this, Jon. This is a

concern I've had from a practical application of technology aspect, and that is in dealing with concentrations of that magnitude, you're down in the subparts per million range.

Have you run across effective technologies that can deal with that?

BISHOP: We require people to clean up at 100 parts per billion. Above drinking water aquifers, the MCL in the groundwater is the driving force. And so if you've got a TCE at, say, 50 to 100 parts per billion, then you're starting to look at having to address that problem.

BURIL: What do they use?

BISHOP: They use vapor extraction.

BURIL: With what kind of treatment?

BISHOP: These are carbon canisters. Pretty low level of contamination.

ROBLES: Is it effective?

BISHOP: Yes. It works good. They get gallons of solvent out of the soil gas by doing that. It's actually fairly quick. I can't tell you how quick, because it depends on so many factors. But we've had ones that have started and within two years are done. They go and they shut it off, they get the rebound, they start it up, it's a little lower, they

do that. They get it to a point where they're essentially not picking out any more contamination. I think it's worth investigating. But the tradeoff is going to be -- it's going to cost to investigate that.

BURIL: Right.

ROBLES: Right.

BISHOP: But the tradeoff is then you have this --

ROBLES: It's a good recommendation.

BURIL: It's a valid point.

ROBLES: Very valid point.

BURIL: One we didn't notice, unfortunately. I'm glad you pointed it out, quite frankly.

ROBLES: It will be a suggestion to take back to NASA and see if we can get some funding.

BURIL: Let me explore this just a little bit more for a second. When you talk about characterizing that particular area, I'm going to focus on that one because that appears to have a correlation there that is worthwhile to evaluate.

Are we talking about something that, in your mind, would require an extensive array of soil probes or one well that would go much deeper than the 95 to identify the vertical component?

BISHOP: I think you're going to have to look at both. You're going to have to look deeper to see if you've got this increasing -- because if that's -- let's take one range of things. If that's your highest, happens to be at 95 feet and then you're going to decrease as you're going down, you say, well, we have a slug that's in there and it may not be worth vapor extraction.

On the other hand, if it's increasing as it goes down and you're saying, well, actually we get above the water table we've still got pure saturation product, essentially, moving down through here.

But it would be a really good thing to start pulling that out before it hits the groundwater. But one well in one position isn't going to tell you that. It's going to give you some idea of it, but if you say, okay, I'm going to do an extraction system there, how big do I need to make that extraction system? Do I need it to be able to pull vapor from just the area right within 10 or 15 feet of that well, or do we need to have it pull the area all the way under that building.

You've got two things going on at once. One is trying to determine how big the problem is,

and the other is, is it worth treating.

ROBLES: Are you looking at this activity like an interim removal action? (IRA)

BISHOP: That would have to be -- I think you might.

LOWE: Yes, you could do this as a non-time critical removal, which means you have to do an engineering evaluation cost.

ROBLES: An EECA?

LOWE: Yes, an EECA instead of the RFS.

ROBLES: I think I would like to do it that way, if it pans out that an interim removal action is possible it would be the fastest way to get the funding necessary to get out contamination.

LOWE: Yes. And it would be the fastest way to get the system out there, too. It's a much shorter process to do an EECA than an RFS.

ROBLES: And then if we get the funding and it works, then we can put the interim removal action into the record of decision and expand it when we get to the remediation phase.

LOWE: That's fine.

BURIL: It's a question mark, though, in terms of our constraints on funding procurement procedure and everything else and then actual investigation

time and sample analysis, and so forth, actually getting something out there.

I mean, Jon's suggestions are good. They are sound from my engineering sense.

But one of the things that concerns me is that as we go into this we could very easily be in a position of spending six, eight months out there going through the whole process of investigation, sampling, analysis, understanding what we're dealing with. I don't think that's unreasonable, but recognizing that this isn't something we're going to get into in the next three or four months kind of thing. We aren't going to have a vapor extraction system there ready to go, say, by springtime, let's say, as an example.

I don't think we're going to be able to move that quickly simply because it takes time to get all this done. These soil borings, these things are awesomely difficult to put in up there because of the terrain and all of our utilities and so forth that we have crisscrossing this entire Lab. It's going to be a difficult process. And I'm not saying it's not worth taking. What I'm saying is, it's going to take time.

BISHOP: I wasn't necessarily saying that this

stuff is moving a foot per day and if you don't get it in in 100 days you're out of luck. I'm saying that, to me, that's an important finding that you found in OU-2.

BURIL: I can't argue that.

BISHOP: I would hate to wait until we have reviewed the RI and say, well, you found this and this is what my suggestion would be. I'm telling you now. And if your internal decision is, you know what, we're just not going to address it, then it will come up again when we do the review of the RI, that this needs further evaluation.

BURIL: This is part of the iterative process of the RI. It's a worthwhile effort.

ROBLES: I personally like to do them as interim removal actions.

BISHOP: I think that's a great idea.

ROBLES: Whenever you see them, get them as early as possible. Because if we wait until the record of decision my concern is that in the future NASA will be going through some budget crunches. And I know what the next year is, but I can't tell you after that. So I want to get it now and start the process now to be sure to get the up-front money rather than wait in the future when there might not

be any dollars.

BISHOP: I agree with you. I think it's a little different than when you're talking about your groundwater that's been there a long time. This you may be able to actually save yourself money by doing it as fast as possible.

BURIL: There's no doubt in my mind that you've got a good idea there.

ROBLES: We'll take that under recommendation, see what we can do. I like the idea.

BURIL: We've got to corner Foster Wheeler on this one and get them to help us out in terms of what this is going to take.

ROBLES: Another investigative well.

BURIL: At least one. That's the distinction. Jon's point is valid. This is what you and I were talking about, that if we got into a position of remediation on this OU-2 there would be an additional degree of characterization that would be necessary in order to assure ourselves we had something worthwhile.

ROBLES: Yes. I think it's a very good recommendation. We need to really see that and take it seriously because I think it has a lot of merit.

BURIL: Yes. I can't argue. I agree. I did

not notice that correlation. I don't know if anyone else did either. But I didn't notice it.

ROBLES: Okay.

NIOU: I have a question. On the old Table 5-21 of the work plan, there is a seepage pit number 31 which has very high carbon tet.

BURIL: Isn't 31 the old storm drain?

NIOU: Yes, northeast of the site, near that building. Near MW-1 and MW-31.

But I notice the new data doesn't show much. I'm just curious. Have you guys found any reason?

BURIL: Stephen, I'm going to try and remember the data that you're looking at. Was this some of the very earliest soil vapor data that we had presented?

NIOU: This is pre-RI.

BURIL: That's the nine sites.

NIOU: I'm just curious. Have you guys found any reason why that disappeared?

Buril: No. We think, quite honestly, that was a figment of the soil vapor company's imagination. We have not been able to reproduce that.

NIOU: It's awfully high, and suddenly new ones --

BURIL: The new ones all show low. I think one of the problems we had was that the QA on the initial nine sites wasn't as high as it is now. And I think that because of that, something happened in the analysis. We don't know what. We don't have an explanation. But we've gone back a couple of times now looking in that same area and haven't found nearly that concentration. So we can only think data quality is the culprit there. We can't think of an explanation why suddenly it would drop like, what I recall, to be orders of magnitude.

NIOU: Not only one order. Three orders. Quite a bit.

Probably another thing is, a recommendation is to really evaluate the old data, including soil vapor and groundwater data, see how much we can really use from those data. Because these data definitely show that the old data may not be that reliable.

BURIL: In the soil vapor I think that may be true. I don't know about the water. I'm not sure if we've done a comparison analysis.

NIOU: I'm not saying water is not as reliable.

CUTLER: Between what?

BURIL: The older data from the first ten events

in comparison to the new validated data.

CUTLER: Other than it just looks very, very similar; extremely.

BURIL: That may be the degree of the kind of analysis we can really do, is to give ourselves, for lack of a better term, the "warm fuzzy" that they're telling us essentially the same thing so that the data are probably usable in a quantitative sense to a point. Where that point is I don't really know. But I don't think we can place as much emphasis on the past data as we can on the new data. But we can certainly take comfort from the fact it's telling us much the same kind of information. You're given different conditions as they changed over time. From that standpoint I think we can utilize that. But we haven't done an in-depth comparison of those kind of things.

RANDOLPH: Stephen, that initial probe at 31 was done immediately following all the reconstruction in that area and the whole complete redevelopment and rebuilding of that particular driveway. It was very, very shortly after the completion of that new construction that soil vapor probe was put in. And it was done during a pilot program just to see if anything would be of benefit to us from using soil

vapor or soil gas.

CUTLER: I believe it was during that construction is when they ran into that little catch basin.

RANDOLPH: That was actually a little bit farther north, at 36, at the northeast end of Building 107.

BURIL: When we first did this, just going back to a little bit of the history, the conditions that we had run into geologically were such that we thought soil gas was going to be a waste of time based on the technologies we were looking at, driving the half inch tube down with a point on the end to be able to go through essentially sand or clay or something of that nature, something very soft, not a lot of rocks. Here we've had the air percussion rig stopped cold by the rocks that we ran into. So we thought the technique is something that may not even be applicable. We may not be able to do anything with soil gas in that kind of formation. So that was the initial nine samples that we did, was just to go around at different points where we thought we'd find something and see if it even worked. That's the numbers that you're looking at there.

BISHOP: So you did go back, though. It's hard for me, because this one has got the seepage pit number and then the proposed boring number. So that would be -- I was trying to correlate to see. Then you went back and got some other stuff.

BURIL: It actually correlates to boring number 31 now. I don't recall being --

NIOU: Seepage number 31.

BURIL: I'm sorry. Seepage pit number 31.

RANDOLPH: Seepage pit 31 didn't have a new boring. We had drilled a hole there down to 100 feet.

BURIL: The closest one to it is Well Number 5, currently.

RANDOLPH: 5 is across the street and either 3 or 4 was --

BURIL: 4 is just at the other end of the building.

NIOU: 3 and 5.

BURIL: No. 4 and 5. 3 is at the other end of the parking lot.

BISHOP: Just to follow up on what Steve was saying, see if it makes sense to me, this is where you had the really high hit?

BURIL: One high hit. Right.

BISHOP: And then these were your follow-up locations, which were low.

BURIL: Right.

BISHOP: So there's never been any further investigation of that area here where you had the really high hit.

RANDOLPH: Actually, that was not a seepage pit. That was a storm drain catch basin.

BURIL: 36 or 31?

RANDOLPH: 31. That's where we had the -- during the soil vapor program and we also had a soil boring there that went 100 feet, which we found nothing.

BISHOP: So you had a soil boring.

RANDOLPH: Pre-RI.

BISHOP: At that location.

RANDOLPH: At that location.

BISHOP: And you have that data.

BURIL: Yes. It's buried amongst all the other data that we have.

RANDOLPH: It's in the general work plan.

NIOU: Back to that 16, probably, according to Jon, it seems the reason you want to do more investigation and to remediate that part is to save the money on groundwater remediation because it's

low. If you do risk assessment, probably no --

BURIL: The risk assessment aspect of this isn't really going to --

NIOU: No groundwater assessment to that deep soil. So it's for that.

But another thought is, if it's your investigation, your system, installation really exceed the amount and the difficulty that you mention, really exceed the amount of actual money that you put in for groundwater remediation, it seems the ground water level on carbon tet and TCE stabilize, then maybe that's another story.

BURIL: That's a good point.

Given that we've got something, as Stephen indicates, that would have what appears to be a relatively low risk potential as far as a risk assessment that we perform for the vapor portion of this.

BISHOP: Right.

BURIL: If we were able to show in some fashion, and don't ask me how right now because I'm not sure, but if we were able to show in some fashion that the cost of getting in there and actually remediating the vapor itself would exceed the cost of just allowing you to get to the groundwater and then take

it out there, would that be a consideration on the part of the Board to say don't bother at this point?

BISHOP: I think you would have to actually have some information before you could do that. One point there doesn't really tell us that.

BURIL: I agree. But I'm talking about in concept.

BISHOP: I think that will be your decision.

BURIL: That's what I wanted to understand.

ROBLES: That is part of the EECA. That's part of the EECA. It has to determine which is the best way. Because one of the criteria of an EECA is cost.

BURIL: I agree. I know that. I just wanted to be sure that in Jon's experience there hasn't been something overriding in that area.

BISHOP: In other situations where we've had levels that we think are contributing to groundwater and the site, for one reason or another, doesn't feel that they wanted to clean up or could, they made sure they had a good monitoring network and they did hydraulic control by pumping that to make sure that wasn't leaving the site.

BURIL: That's our alternative.

BISHOP: Essentially, yes, that's your

alternative.

BURIL: All right. That's fine.

Food for thought.

ROBLES: We're doing this, basically, at JPL Edwards, where we're going down and basically doing EECAs and then doing a preliminary risk assessment tied in with the EECAs to determine risk so that when we get to the record of decision we basically have low risk sites and turn over the total property to the Air Force for future cleanup action.

BURIL: If there's any cleanup left to do.

ROBLES: We're trying to do everything with EECAs ahead of time. And the EPA and the State has bought off on it.

BURIL: They're rather thrilled with it, as a matter of fact.

BISHOP: Yes. I think it works great for contaminated soil sources.

BURIL: Any other questions or comments on OU-2? Okay.

Vinny, do you want to give us an update on where we are with OU-3. You could probably sit here and tell us where we stand. We're going to combine it with 1 and 4, 5 and 6.

RICHARDS: As you know, we completed the

drilling and we completed the -- I wish I had my sample register with me, but we completed the sampling just August 11th, I think was our last day of sampling on the five off-site wells, 25 screened areas. So we finished that.

And last week Westbay came back and we finished the K testing. So that data is getting analyzed now. So we started the K testing. And also at the same time we did basically a groundwater level of the five off-site wells and the five multi-port wells on site. So we completed that. So that data will be getting generated.

We're starting, then, now a system of monthly water level readings.

BISHOP: You mean at the different screens?

RICHARDS: Right. It's pretty simple. The sampler is a pressure transducer, so it's just simply lowered into the hole and then there's no open or closing anymore. Simply just attach -- it's just activated. It's placed against the measuring port and then a reading is recorded.

BURIL: You've seen the Westbay system.

BISHOP: Yes. I just wanted to make sure they were getting done at all the different levels.

RICHARDS: We start at the bottom and just come

right up to the top. It takes maybe 45 minutes per well to do all five, and then we go to each well. We'll visit each site. So try to get them done within a one- to two-day period there, just depending. Some of the wells are about 900 feet so it takes a while to get down.

So those water levels are pretty consistent with the sampling. What we did is we took water levels before we sampled. Then you technically get a water level while you're sampling. But then the sampling at the very end just sort of covers the whole wells at that end date because it takes a day to sample each screen. So it takes a week to sample one well.

So that's where we are.

BURIL: The samples are now in the lab ready to go.

RICHARDS: Samples are in the lab being analyzed.

BURIL: We have a couple of verbal numbers I'll just share with you from some of the screens. What we're finding right now is TCE, and I believe there was one carbon tet number that was .6 with the MCL being .5. But virtually everything else we've gotten in verbals. It's only been for a couple

wells and a couple screens has been below MCL on the VOCs. We haven't gotten any inorganics back yet, that I know.

It's looking, at least on the surface, take this data with a grain of salt, of course, because it is verbal and there's nothing been validated or anything else, but on the surface it looks as though what we've been thinking is going to happen out there on OU-3 is going to happen. That is, that we're going to find very low levels of concentrations of the VOCs. And I think that's not entirely unexpected given what we find in the City of Pasadena wells and the Lincoln Avenue wells and so forth. It's actually bearing that out.

That's about it on OU-3 unless anybody has got any questions. Not a lot to tell you, unfortunately.

ROBLES: On Lincoln, we've started negotiations with Lincoln Avenue Water to do the same things that we've done to Pasadena, put wellhead treatment. So we are very excited about that. We want a full and final settlement with them which will allow us to basically protect the public there as well.

We're doing this because of the past. I guess an anomalous report.

BURIL: We don't know what happened.

ROBLES: We've taken a proactive approach. We view this, even though positively, because if there is any doubt we want to make sure that we're a good neighbor. Because that is a concern for us. As well as the fact that Altadena is an environmental justice concern for us. So we want to make sure that we're very proactive with them.

BISHOP: Good. I'm glad to hear it.

BURIL: I think overall it's a really nice thing to point out here, and I want to be sure we do that. As far as immediate points of exposure, there is now treatment that eliminates the potential for exposure on every single well that's next to JPL. We're covered, which is really nice.

I take that back. I guess Lincoln has one that they're thinking they want to build on. We're still negotiating with them on that one well. But they don't apparently use it as often as the other one. They tend to preferentially use the other because they have the treatment on it.

ROBLES: We're looking at a substantial investment, three-quarters of a million dollars for installation of wellhead treatment. That's big bucks.

And also the fact that NASA has taken its position with the Department of Justice. We now have that as part of our policy. We have to incorporate that in our policy statements from our administrator in all of our decisionmaking documents. So it's something that we've stepped forward to do.

In a sense, as Chuck says, that will provide us with wellhead treatment to the public, and from that standpoint I'm very excited because that lowers the human risk issues here and then we can deal with contamination ecologically instead of the human factor. We're still always concerned about that. But that's a "warm fuzzy" for me.

LOWE: Where are the Lincoln Avenue wells located?

BURIL: Looking on the OU-3 map, these are the four City of Pasadena wells. And the treatment plant for them is located right here. Maybe you remember that. These are the two Lincoln Avenue wells right here.

LOWE: Okay. Great.

BISHOP: I remember I think from the last OU-3 update, it seemed like - I'm going to forget - that it might have been like a slug of contamination that

moved over there and it's been kind of dissipating with --

ROBLES: We don't know. That's what the problem is, we can't regenerate the historical data. If there has been anything gone off site, we can't find it. And the preliminary data shows that.

That's why we wanted to go out there, first of all, because of the environmental justice issue with Altadena, and plus the fact we wanted to prove to ourselves and to you RPM's that the plume is not going off site, particularly in an area of drinking water. We can't find that. So I can't say yes or no. I can't dispute it.

So that's why we, as JPL and as policy, work with our communities around us, because if they feel -- you know, perception is more important than reality, and they're looking for the deepest pockets. To us it's a small thing and, plus, it's part of and can be easily incorporated into our overall strategy. So it's something that we have worked at. I think it's also good leverage talking about environmental justice to get money from NASA headquarters. So we play both ends across the middle as well.

BISHOP: I know it has been an issue that has

been brought to our attention in the past about Lincoln Avenue, and why was Pasadena and Lincoln not.

BURIL: There are a lot of issues behind that that go back in history as to who didn't or did react. And I don't even think it's worthwhile to worry about that.

ROBLES: The biggest thing is, we had asked Lincoln to give us input, and they never did. And they've come back five years later. So what we've told them is if you wait any longer, because this year is really critical, after this we're not sure if we're going to have any money to do this negotiation. We've asked them and they're about five days away to make a choice. We've negotiated and we want that. We would like to see that done really well.

BURIL: We've been going at this for about an hour and a half. Does everybody want to take a ten-minute break and come back?

NIOU: Just a last question to Mark. This is very short. Can we have your aquifer test data and, plus, today you're showing us the water gradient data.

CUTLER: It's up to you guys.

BURIL: I tell you what. Some of the stuff that Mark showed up there I have not seen yet. This was one of the things that kind of took me a little bit by surprise, although the data I think is not all that big in terms of not giving it to you. What I'd like to do is I'd like to be sure that I know what I'm giving you first.

NIOU: Sure. No problem.

BURIL: Once I have that done, then it's no problem.

NIOU: Doesn't have to be tomorrow.

BURIL: I don't see any reason why we couldn't provide it to you by the next RPM meeting or before the next RPM meeting.

ROBLES: I have no problem with it.

NIOU: Appreciate it.

ROBLES: You need to have that data to make a decision. So I have no problem with it either.

LOWE: Also in the future, can we try and get some of these maps and graphs on overheads rather than little pieces of paper in the front of the room?

CUTLER: Yes. I understand. It was kind of short notice. We weren't certain what was going to be presented or not.

BURIL: Part of the problem, too, was mine in so much as we were working these things back and forth as far as what can we show that at least makes some sense at this point. We were trying to bring everything together. We were working this for, what, about three weeks, Mark? Two, three weeks or something of that nature. And we finally came up with something we thought was cohesive. But by the time we came up with it, it was basically, well, we're going to have to hand it out here and hold up pieces of paper. That's unfortunate. I recognize your concern. We'll certainly try to do that.

LOWE: Okay.

BURIL: Let's take a break.

(A recess was taken from 10:44 A.M. to 11:09 A.M.)

BURIL: The next one I think is one that we need to kind of get some feedback from the agencies.

RANDOLPH: I'd like to make two comments.

BURIL: Go ahead.

RANDOLPH: These two comments are regarding the data table for soil vapor results and soil boring or soil sample results, chemical analyses.

On the soil vapor tables, any "N/S" that you see, "N/S," that basically in the notation under

the footnote says "Not sampled." Well, that's not quite true. Everything was sampled. That should be "non-detect" or a blank on the table.

And on the soil results for metal and other inorganics, you will also see "N/S." That should be "nonanalyzed" or an "N/A" because that sample was archived. And the analyses where it says "N/S" were not performed. But they did have the mercury and hex chrome analysis performed on them. So anything you see on the soil sample results where it says "N/S" should just be "N/A" or "Not analyzed."

BISHOP: Then on the soil vapor, all those, they should have been N/Ds?

RANDOLPH: Right. Or a blank, like the rest of them. Because they had to be sampled. We have results.

BURIL: Thanks, B.G.

Okay. I guess we're up to number 2 now, as far as our agenda goes. I guess really we're looking for some feedback from the agencies regarding the proposal that we sent out. I don't recall the exact date, but I believe it was sometime in July that we got it out to you. It was kind of in two formats, one with a mistake in it and a

second one that corrected that.

We're kind of curious to hear what your thoughts are about it and if you have any comments, concerns, whatever, on what you see thus far.

LOWE: Do you want to kick off the on-site well discussion?

BISHOP: Yes. Well, some of the issues that I had concern on the on-site well were discussed today, which was the rationale or back-up information for the rationale on the locations of -- I have to look at my map to tell you which. Of 22 and 23, which are the --

BURIL: I'm trying to remember myself which ones those are. Those are the two that are the halfways?

BISHOP: Yes. 22 is over here somewhere, and 23 is down there.

BURIL: Okay. That's right.

BISHOP: Those two. And not having that information that was presented today, it was unclear on why they were put where they were put.

I can kind of see you're trying to get an extent here for 22 between MW-6 and MW-13.

BURIL: But why is that important, kind of?

BISHOP: Well, what was the reasoning for where it was put in that it could have gone --

BURIL: North/south?

BISHOP: Yes. North, south or east or west.

I'm really unsure with 23 what the need for it was at all in terms of when you look at -- if you look at it without this data, of the chemical and the groundwater flow it looks to me like you could say, well, you know your extent of TCE comes down here to 10 so this well in between is not really all that important.

But if you're looking now with this change in the flow regime and trying to determine where the connection either between 14 and 10 or 8 and 10 or 13 and 10, it makes more sense to me now on that.

BURIL: Good.

BISHOP: I would still appreciate, and probably this could happen very shortly, some of the actual water level data itself so that I can look at it.

BURIL: You mean the raw data?

BISHOP: Yes, the raw data. I don't really want to see hourly water levels.

BURIL: I was going to say, we can give it to you.

BISHOP: For two years.

BURIL: We can bury you if you like.

CUTLER: Darn, that's what I was thinking.

BISHOP: I knew you were.

I'm not sure how you have it organized. Do you have it in like a database?

CUTLER: Yes. That one hydrograph is all in one large, I believe it's an Excel file at this point.

BISHOP: Then when you did these you just pulled out for like -- when you did like the November, you pulled out those for that sampling event to do the contouring?

CUTLER: That's a little different. For each 13 events we didn't have transducers in the ground for the early ones. All those maps were from the water levels collected at that sampling event.

BURIL: What data would you like to see, Jon, and how much of it?

BISHOP: And how much of it.

CUTLER: We have it just for each sampling event all just on a table. The big hydrograph, it's in the computer database.

BISHOP: I don't really want to look at all the data.

BURIL: There's mountains of it.

CUTLER: This is just all the elevations for each sampling event for each well. This is what those maps that we --

BISHOP: This is exactly, then, probably what I would need, just to take a look at it and see if my interpretation is in agreement, which I'm not necessarily saying it won't be. I just want to make that --

BURIL: Sure. I understand.

CUTLER: Okay.

ROBLES: Would the other people like to get a copy of that, too?

NIOU: Yes. Please.

NAKASHIMA: Yes.

LOWE: Yes.

BURIL: We should.

ROBLES: Okay.

BISHOP: That kind of cooked in to what I was talking about for 16, is on MW-24. I would consider thinking, or I would think about the location of MW-24 as being related to the hottest area of that source so that you know that you're down gradient from that source area, that is, you're down gradient and you're going with depth, you're not missing the area where you might have your really high contamination of carbon tetrachloride. I'm not sure how that works with your timing and all your other things, but I would consider that in your thinking,

is you kind of place this, it seems to me, at a location that you could easily get in and drill at somewhere in that area.

BURIL: Is that even possible?

CUTLER: It's basically the only one in that area.

BISHOP: That may make your determination for you.

BURIL: Yes, I think it might.

BISHOP: It would be unfortunate if when you do your -- if you go farther in your soil analysis, or gas analysis, to see that the area of contamination, the highest area of contamination is maybe -- what have we got? Farther east and that's just the west side of it and then you're getting your direction of flow going the other way, then that well is not picking up what you want.

BURIL: If I can interpret, kind of paraphrase what I'm hearing from you, Jon, is that we should probably consider trying to tie whatever additional investigative work we could do around boring or site 16 with the location of this well so that we can assure ourselves that we've got the well located in such a fashion in relationship to what we believe might be the source area that we've accounted for

that in some fashion in terms of flow direction and other factors.

BISHOP: That's exactly what I was trying to say, is you don't want to end up spending a lot of money drilling this well and come back after you've done an analysis and you find your real hot spot and you're looking at your flow direction and it's really kind of going the other way from there, and then you're kind of like, well, I guess we have to put in another deep well. That just tends to be a waste of time and money.

BURIL: Yes. That's an excellent suggestion, in my opinion.

Okay. Anyone else have something they'd like to comment on on the OU-1 portion of it?

That was easy.

LOWE: We all coordinated.

BURIL: Good. Great.

How about OU-2? Who wants to take that one?

LOWE: That's Penny's job.

NAKASHIMA: What I was looking at, and I know you proposed to excavate some pits and then take samples, undisturbed samples or bulk soil samples. What I think you can do is go in and with hand

augers --

BURIL: You've got to go out there and look at that, Penny. You can't do that. It is an impossibility. The stuff you're talking about, you're dealing with anything from coarse gravel to boulders, with some soils kind of in between them. The areas that we're talking about, we hand walked this --

RANDOLPH: Right.

BURIL: -- Peter and myself, Judy, B.G. I think it might be beneficial for you to walk in there, too, and take a look at what we're dealing with, because it is not something that hand equipment could deal with. You could maybe get a few feet, maybe a foot or so before you hit something that's going to stop you cold. That was the reason for trying to bring in a piece of power equipment, was to be able to get through the smaller of these things and actually get to a depth where we felt we could get a reasonable soil sample.

Beyond that, I'm not sure what else we could do. B.G. --

RANDOLPH: I believe we're going to have a real tough time even with a good sized backhoe or a decent sized backhoe that we can get out there and

maneuver around in the area. I think we're going to have trouble getting to five feet. I think it will be very difficult. It will not be an easy task with a backhoe.

BURIL: One of the things that would be helpful, if you have the time, is just take a walk back there. The differential stream cuts that we've had over the years, you see these big, washed-out gullies. Some of these things are three, four, five feet deep. You have these chunks of soil and rock and so forth that are strewn all through this. Some of these are on slopes that are one-on-one or better, as far as steepness goes.

So getting hand equipment in there, given the conditions as far as having gravel and cobbles and boulders and everything and actually being able to get a sample I think is something we can't guarantee you at all. It's going to be immensely difficult to get any kind of power equipment in there either.

It's one of these things that the terrain just doesn't really lend itself to anything other than trying to do what basically we proposed.

I don't have much more I can add to that except to say it would be really beneficial for you

to take a look at that. You can see the concerns that we have as far as getting things in there and how to do this, because it's really a rough, rough situation. We really don't know what else to do.

Maybe you might have another suggestion if you go out and take a look at it, as far as what else we might be able to come up with. We're more than open to suggestion. But just on our previous experience here, right here on the Laboratory, we've got hand augering equipment, and I'd say if we ever get more than about six, eight feet, it's a miracle. And typically that's only in fill that's been brought in and used for whatever here on the Laboratory.

You get out in the arroyo, forget it. It's just too difficult in terms of the geology that's there.

ROBLES: Why don't we let Penny walk out there and then make a suggestion afterwards.

BURIL: I think that would be a great idea. I'd love to hear another suggestion that might be useful.

NAKASHIMA: If you do go with the trenches, in the areas that you're putting in the trenches, maybe you could -- can you take out like some field

equipment where you can -- like an OVA or something where you can measure the --

BURIL: I don't think that's a problem.

NAKASHIMA: And then if you do detect something and have your samples analyzed for these things.

BURIL: Let me see if we can come up with a methodology that we might do that. If we did like a plastic bag head space analysis or something of that nature, where we took an extra soil sample, threw it in a plastic bag and then put the intake of, say, OVA or Hnu or some form of instrument that could measure volatiles and break it up in some fashion, whatever volatilizes, then we'd be able to measure and see what it is.

Is that the kind of thing that you're thinking of?

NAKASHIMA: Right.

BURIL: I'm not sure what technique would be really reasonable. That's what I've used in the past on gasoline stations on how deep should I drill, kind of thing.

But again, we're open to suggestion on that. As far as utilizing the instruments, I don't think that should be a real problem. I don't think there should be any reason why we wouldn't do it.

I've got no reason to think that would be a problem.

NAKASHIMA: Okay. So I'm just worried about if there are any pockets of gas remaining.

BURIL: I understand.

NAKASHIMA: And then also, I'm going to propose that JPL perform a geophysical survey out in the arroyo area. Because I know that there's documentation that things have been disposed of, buried out there from JPL.

BURIL: Buried?

NAKASHIMA: Just to --

BURIL: What are you thinking of, Penny? The only thing I can think of that was buried was actually -- I don't know if you could term it buried, but regardless, was that aluminum oxide.

NAKASHIMA: Right. We don't know what else is out there. And this would give you an idea of where you find your anomalies, then you can focus in on those areas and --

ROBLES: I'm pleading ignorant. What are you actually asking? I don't know what you mean by geophysical survey.

BURIL: A geophysical survey. You're talking about something like ground-penetrating radar or a magnetometer survey or something of that nature?

NAKASHIMA: Right.

BURIL: What they're looking for is virtually anything that's out there. That might be a buried drum, buried debris. Anything that's not on the surface.

ROBLES: Then we go after every drum that we find?

BURIL: Then I don't know what we do. Here is where I come up with a concern and I think Peter --

ROBLES: What do we do with the data then? If we find a drum everywhere in the arroyo, what do we do with that information?

NAKASHIMA: Where you find a drum everywhere?

ROBLES: Let's say there's a drum here and a pocket here and a pocket here and a pocket here and a pocket here. What do I do? Are you suggesting that I go after everything that I find?

NAKASHIMA: No. In the areas where it appears as if there has been some contribution from JPL, as from the previous documentation --

ROBLES: Radar is not going to tell me that.

BURIL: Here is the concern.

ROBLES: No, no. Wait a minute.

What is radar going to tell me?

NAKASHIMA: If you use like an electro -- your

EM or you'll have some anomalies or you may find some anomalies, which will indicate that you may have some --

ROBLES: Something buried there.

NAKASHIMA: Right.

ROBLES: But then how do I know that's JPL's?

NAKASHIMA: Going back to the documentation, there were things that were disposed of in the arroyo. See, what I'm trying to do is just to put this issue to rest. If you do the minimal amount of work, the geophysical survey, and you go out and do some soil samples, then with the results, if it shows that there's nothing there, then you say, okay, we've investigated this area and there appears to be nothing out there.

ROBLES: But if there is something there and I don't know it's JPL's and I go out there and find it and there's no indication who owns that, you are saying that I must assume it's mine?

NAKASHIMA: Well, if it's been used on the site, on the facility and from the documentation --

ROBLES: But that has been a dumping ground for Pasadena and every other industrial. How do I know that it's mine or not mine? These drums, unless they say JPL on it, I'm not going to know that.

NAKASHIMA: If it was something that was used on the facility --

BURIL: Let me give you an example.

ROBLES: Hold on. I still got to get this settled.

Say Company XYZ puts something out there. I dig it up and find it. We don't know whose it is. What do I do with that?

BURIL: Let me give you an example of that. Let's say that we go out there. And I've got a historical photograph here. It shows the border of JPL and there are actually pits out there. And we have documentation available that shows the City of Pasadena operated these. We go out there and say we find a spray can, no label, no nothing. I'll guarantee you JPL uses spray cans. Are we going to be responsible for that? You can't say it's JPL's just because we used it. And you can't say it's somebody else's just because the rest of the world uses them, too. How do we make the determination? That's the problem we're trying to wrestle with.

NAKASHIMA: We're not talking about just a can. We're talking about contamination that's found out there.

ROBLES: Whose contamination?

NAKASHIMA: Well, that's something that will have to be determined from looking at the label.

ROBLES: How?

NAKASHIMA: If it's something JPL used or something that JPL had documentation showing that was disposed of in the arroyo then --

ROBLES: Carbon tet, TCE was used in the industry around here. How am I going to tell which molecule is mine? If I find TCE out there or carbon tet how do I know it's mine or from an industrial activity in Pasadena that put it out there?

What I'm telling you, Penny, I am not going to clean up the Arroyo Seco or find stuff that I don't know is mine. And I'm not going to spend taxpayers' money on cleaning up Pasadena's problems. I am not empowered to do that and I will not do that.

I am trying to be amiable with you, but I am not going to go out there and search with ground-penetrating radar to find something that doesn't tell me that it's mine. There's no proof that it is mine. It is a no-man's land out there.

NAKASHIMA: But there are certain things that are from the facility.

ROBLES: And there are certain things that are

from Pasadena, and you cannot tell the difference. How are you going to tell the difference? The chemicals that we used here were the chemicals that were used there. The equipment that was used up here, except for space or rocket activities, cannot be determined to come from here or from Pasadena. And if I don't find a JPL label out there, I don't know if it's mine. So how am I going to make that determination and how am I going to clean it up? You're looking for the deepest pockets to investigate and pay for the cleanup, and I'm not playing that game.

NAKASHIMA: When you find some contamination and if you can show that it is not yours, then you can go after the other person to have them --

BURIL: Can you give us an example of the contamination that you're thinking about that would be JPL's and not somebody else's?

NAKASHIMA: I'm thinking about from the solvents that were used on the site, from the materials that have documentation showing its disposal.

BURIL: How would ground-penetrating radar help us determine that?

NAKASHIMA: I didn't say specifically ground-pentrating radar.

BURIL: Whatever. I guess what I'm getting to is, in trying to evaluate what we should do out there it sounds like you're asking us to go out there and kind of look for virtually anything we can find and then analyze it to figure out whether it's ours or not.

ROBLES: And that's not going to prove anything.

BURIL: I don't know if that's what your intent is, but that's kind of what I'm picking up. I'm not sure that's even reasonable at this point.

ROBLES: Consider this, is the Arroyo Seco on the National Priorities List?

NAKASHIMA: No, but if there's contamination from the site that has impacted the arroyo --

ROBLES: According to the federal facility agreement, our site is on the National Priorities List. We will handle that. The Arroyo Seco, until somebody tells me that they have absolute proof that they know of contamination out there, I'm not going to waste taxpayers' money to do that. I cannot. I cannot in good conscience. You're asking me to do a witch hunt to go out there and find any chemical. I can't do that, Penny. I don't have the authority.

NAKASHIMA: The FFA states that if there's contamination that's off site as a result of

operations from JPL, then perhaps you are responsible for it.

BURIL: No doubt.

ROBLES: No doubt. But tell me, how can I prove that it is mine? I can't. And since that's a no-man's land and everybody else used it there, you need to go to Pasadena and tell them to conduct an investigation. That's their area. That's not ours. You need to tell Pasadena to go do that.

BISHOP: I'm not sure that I necessarily agree or disagree, but there is evidence that JPL or NASA dumped in the arroyo.

ROBLES: Right.

BISHOP: Now, we all know that that kind of evidence is very sketchy. So if it happened once, did it happen once, did it happen 100 times or did it happen only once?

ROBLES: I don't know.

BISHOP: That's the debate issue. And I'm not sure how we --

BURIL: I'm not sure how we do that either, Jon. Here is one of the things I'd like to point out, and I'll show this to Debbie first and if you guys want to crane your necks to see this, I'll show you one of the reasons I think Peter is so concerned.

This is a photo from 1952. This is provided by the EPA Nevada Lab. It shows this area here, area G. And based on our historical records, this was an actual small-scale landfill being used by the City of Pasadena. This shows the current outline of JPL. That day's outline is back here. Here is the fence line right here. So that wasn't operated by JPL.

Here is two more trenches out here. JPL's property boundary stopped down in here. This is clearly part of the City of Pasadena. And if we go out, reason would dictate that we would look in these locations, see what we find. If we find, who do we point the finger at?

Because you're going back in time in a situation where things have changed in terms of their ownership, in terms of the knowledge of what you can and can't dump, and so forth. The idea of dumping car bodies, let's say, something that people might have thought was relatively inert, no big deal, just go ahead and throw them out there, they'll just rust away.

ROBLES: Batteries.

BURIL: Batteries maybe. Anything.

ROBLES: Drums.

BURIL: We go out there and we find lead or we find chromium. Did it come from a battery or did it come from JPL? Did it come from a bumper or did it come from something from JPL? That's the kind of thing we're trying to wrestle with. And I don't have a good answer to try and address that.

ROBLES: To be honest with you, I think ground-penetrating radar is going to be difficult with the kind of geology we have out there.

RANDOLPH: May I interject that ground-penetrating radar is practically worthless on the Lab where we're operating with a fill of known material. If we get more than three and a half feet to four feet below ground surface, we consider it extremely very lucky. Ordinarily it's about two and a half feet, max.

BURIL: That's one technique.

RANDOLPH: Out in the arroyo its worth would be absolutely zero. Electromagnetics may give you something if you can find something worthwhile, except for reinforced concrete, pieces that are out there with a rebar. There are pieces of pipe out there that God only knows where they came from. They're in the main channel now. And they could have very easily come from well north of JPL showing

where they are.

With the recent flood flows that we've had, undoubtedly there are other metallic objects out there in that particular area. I'd say an average of 12 feet up to a maximum of 20 feet of material has been eroded and anything that JPL would have put out there years ago is long gone and the area that we propose the test pits with a backhoe are in the most logical and the only remaining places that are left untouched from those historic times.

BURIL: I'm going to try and see whether this photo here will help give you a little better visualization of what B.G. is talking about as far as erosional features go.

Debbie, we showed you this when we were here in -- when was that? July?

LOWE: Yes.

BURIL: See these twin power poles here? This one you can't see. It's off the edge of the picture. But here's another one here. I think you can see the two power poles right here.

This is a bank leading up to the top where the bushes are. That bank right there is essentially a steep cut. That's somewhere between,

what, B.G.? 10 feet high?

RANDOLPH: I'd say 18 to 20 feet.

BURIL: Is it that high?

RANDOLPH: Yes, sir.

BURIL: 18 to 20 feet difference. If you take a look at the historical photos there, and you can actually find one that we've looked at. I believe they're in that book, or were they in the other photos?

RANDOLPH: They're in the other one.

BURIL: Okay. But we have other photos dating back to the early '50s, late '40s time frame?

RANDOLPH: Late '40s.

BURIL: That show that the arroyo didn't have that kind of relief to it. It was essentially flat all the way across.

RANDOLPH: Back in the '40s those dual power poles had not yet been constructed. They had been, I believe, by the late '50s, and the area through there is still flat.

BURIL: So the concern there being that we go out looking, we have a relatively small chance, in our opinion, of actually finding anything at all.

But when we look and we find, what do we do? I mean, who ends up taking the responsibility

for something that we have no way of proving belongs to any one individual? I mean, if we knew that there was something extremely exotic out there that we could go out and pinpoint and say, yeah, that's absolutely JPL's, no question, then I don't think there would be any argument. In fact, there wouldn't be any argument. There would be no reason to argue.

But the kind of things we're talking about in terms of solvents and so forth, if you're talking about solvent concerns, I think one of the things that we should refer back to is the probe survey that we did where we did a few points along the eastern boundary and we found essentially nothing, didn't we, B.G.?

RANDOLPH: Pretty much.

BURIL: Now, that's at a level that is essentially undisturbed by the erosional features.

And if you go back even further to the ideas of what are we concerned about in terms of an exposure pathway, we've got groundwater monitoring wells all along that eastern periphery. Those wells are showing non-detect for the volatiles, I think, based on my best recollection. I want to make sure that's true. We can look on the maps, make sure

that I'm quoting specifically the right data.

But in terms of the real exposure concern, being the groundwater, from what I can understand, you look at the wells in the arroyo and along the side of the arroyo and we're non-detect. So from a volatile standpoint, I really don't think that, one, the timing and the nature of the materials themselves would give us reason to think that we would go out there and actually find anything.

Secondly, the wells are indicating to us that there's absolutely nothing there at all.

And so we're back to the idea of something that's, one, not volatile and, two, is likely to stay there through all these erosional kind of episodes. The kinds of things that might stay there. Inorganics would be about the only thing I could think of that wouldn't degrade over that 40 years being exposed to that kind of environment in the arroyo. So we're talking metals.

If you're talking metals, then you're talking things that are generally considered by many to be inert, particularly back in that time frame. So then you're talking about possibly going out there and finding chromium. Where did the chrome come from? Did it come from a car bumper? Did it

come from a Laboratory experiment? We don't know. How do we deal with that?

We're talking lead. Did that come from someone dumping a battery out there from an automobile? Because there were known dumps out there. Or did it come from something that JPL did?

This is the crisis I think that Peter is facing. I share it with him from the standpoint that we want to do the right thing, and we will if we can determine how to determine what that is.

ROBLES: I'm going to say this. I may regret it later.

I think that either the City of Pasadena, the County of Los Angeles or the State of California or the U.S. EPA needs to go out there and find out.

But you're not going to put it on NASA. NASA is not going to go out there and investigate and try to find something that it can't prove it is our or is not our. We are PRP on the property that is ours. That is a no-man's land. That belongs to Pasadena. If you want to make them a PRP and theb they come after us, fine.

I cannot. I don't have the authority. I don't have the legal muscle behind me. My management at NASA says no; not only no, but hell,

no. Cannot go out there. We're going beyond what we're supposed to be doing, trying to bend over backwards to meet your requirements. But I cannot go out there and try to find contamination that doesn't prove anything one way or the other. And I'm not going to clean up the Arroyo Seco. I can't. Even if I do find contamination, I can't clean it up because I can't prove it's mine.

Now, for human health risk issues, I think we're addressing those with Pasadena, with Altadena, with what you suggested on our site. I think that's very prudent and it should be. But the Arroyo Seco, I'm sorry, I cannot in good conscience. I don't have that authority.

RANDOLPH: I wanted to mention one little piece of information might be food for thought. We keep referring to documentation that reports dumping, so-called, into the arroyo. We know that aluminum oxide was placed out there. We have an idea of the quantity. We have no idea of where. That was done in the '50s, early '50s. There's other correspondence that's in there I believe prior to that particular letter.

And then thereafter there was another letter regarding some accidental spillage or

possible accidental spillage of various colored liquids. We know where those discharge points are pretty much by basing the date of the letter against the maps that we have of the JPL property at that time, looking at the drainages on aerial photographs and the ones that are shown on the maps. We have an idea where those were emerging into the arroyo. It's right adjacent to the fence line. And that is about the only place that hasn't really been totally destroyed within the arroyo due to natural causes.

I'm thinking, again, if we were to look in those areas, we might find something, and then again we most likely wouldn't. But we don't have the rest of the arroyo to be concerned with. We shouldn't be concerned with.

BURIL: I think what B.G. is pointing out is that we've got, in present day considerations, one or two given areas where these discharges could have occurred that we can go back and actually locate now and look at. And that's basically what the proposal we've laid out there was designed to do, is to look at those.

NAKASHIMA: Can you propose some investigation there to address each of the documented contamination or disposal?

BURIL: I know the aluminum oxide is one you're concerned with.

NAKASHIMA: There's the chrome that was found in the water from the cooling towers. That was being discharged into the arroyo.

RANDOLPH: That's what the proposal was designed to look for.

BURIL: I understand where you're coming from, Penny. In fact, I think we've laid that out.

NAKASHIMA: If you give me something to address those particular areas.

BURIL: You feel the particular proposal you have now isn't adequate to do that?

NAKASHIMA: I would prefer to have undisturbed samples.

BURIL: I don't know how we're going to do it.

ROBLES: There's no undisturbed samples out there.

BURIL: The thing is that we're not trying to be recalcitrant just because we don't want to do it. It's a practical application of what we can actually get accomplished out there.

RANDOLPH: You saw how many samples were destroyed with the thousand-pound hammer that we were trying to obtain undisturbed samples with in

the borings. And we've destroyed sampler after sampler.

NAKASHIMA: You were going a lot deeper than --

BISHOP: I have a suggestion maybe, Penny. In that proposal Chuck put together, this is the documented discharge, this is where we think it is, this is what we're going to do, we're going to -- and lay it each out. Because what we got here is we're going to go out and do some pits in the areas. We don't know where those are.

ROBLES: More definition.

BURIL: So you want just more definition?

BISHOP: That might at least address -- so that Penny feels comfortable that each documented discharge is --

BURIL: We have no problem with that.

BISHOP: -- trying to be addressed, and if it can't be, you at least say that, that we can't even find out where this is, this is the best guess because this is where the drains went and this is where we think it was discharged. But at least that way we've got a one-to-one correspondence.

BURIL: We should be able to do that. Just lay out a little more background as far as our rationale, is basically what you're talking about,

is what I'm getting from you, Jon. Just support everything. And that's not a problem. I have no problem whatsoever if that will help address Penny's concern to a degree.

NAKASHIMA: Right. That would.

LOWE: It would be helpful to identify the pit locations that you're planning to do.

BURIL: When you say "identify the pit locations" --

LOWE: Well, I didn't see any maps in here showing where you were planning to do those pits.

BURIL: We can try to put a map together. The only reason I hesitate -- and it's not an unreasonable request, by any means. The only reason I hesitate is we can tell you where we're going to do it on a map, and physically get out there in the field it could be quite a bit different based on the field conditions. It goes back to the idea of having the conditions as they stand today are X, and over the next three months, I doubt this would happen, but we get a major storm roll through here and suddenly conditions become Y and we're no longer able to get to that location and things have changed, then we wouldn't want to have to repropose to move the thing, or whatever else. It would have

to be understood that we would sample to the best of our ability the locations we identified based on the conditions current at the time. Okay?

NAKASHIMA: You can state that in the proposal.

BURIL: That's fine. I just wanted to be sure that was going to be something people would recognize and could accept up front.

NAKASHIMA: Were you planning to use this as your work plan, or was this just your conceptual idea of what you wanted to do out there?

BURIL: It was one of these things that we were presenting a plan, but we were also presenting a concept at the same time. If there's more detail that you need to be able to support this, we have no problem with providing that. That's not an issue.

But in concept, I guess we're really looking to see whether or not you're willing to accept what we're identifying here.

NAKASHIMA: Okay. Then you'll follow up with an actual work plan or an addendum to the work plan showing --

BURIL: The way we actually plan to do this, we plan to actually modify the work plans and the FSAPs so that basically this is officially accounted for. We would go through all the required detail that

would be required in those documents, and that way we basically got it covered, it's official, it's in public repositories, they know what's going on and everything is, quote, blessed and official.

I don't think there's any reason why we wouldn't want to do that. Because this is a fairly significant expansion over and above what we're talking about in the initial work plan I think that needs to be documented formally to make sure that everyone can follow what we've done.

NOVELLY: Chuck, you mean modified in terms of attaching an addendum?

BURIL: Yes. That's what I'm talking about. I'm not talking about pulling the document out, ripping the whole thing apart and putting it back together again. No. That's too much work for anybody.

An addendum is what we're really talking about; something that lays out in detail what we're doing and why. The document original and the addendum could be considered as a whole, the given document, either the work plan or the FSAP.

Does that make sense? Okay.

RANDOLPH: One other thing that I have found in the documentation provided, or very early

correspondence provided by the City of Pasadena to JPL, or it was in an inspector's report for the City of Pasadena, is reference to the Geo. Hagen dump.

BURIL: Yes.

RANDOLPH: Which is south of the JPL property limits at that time.

BURIL: That was actually George Hagen, I found out.

RANDOLPH: Is that who it was?

BURIL: He was the owner of the rancho that was here before. In fact, we found Mr. Hagen's dump, at least in part, when we excavated our basement for our Observational Instruments Laboratory. We found God awful amounts of garbage in that thing. Brush and debris, car bumpers, an engine block, all manner of things that you would associate with someone just dumping something in a canyon.

And, in fact, when you look back -- Jon has the thing there. I think when you look back, you'll actually see that there is a small canyon in the immediate -- what is it? East central part of the Lab, right back in here. There was a very small canyon right in here. I've been told this is kind of the outlet of it here coming down. Very small kind of thing, but something you could dump into. I

believe that's where it was. We may have better pictures of it further on.

B.G., do you remember that one we saw and it looked like they were filling in that one area. That's what I'm thinking of.

RANDOLPH: That was right at the southwest corner of the old Southern California transformer yard.

BURIL: Which would have been -- let's show you where that is. Here is the Southern California yard right here.

RANDOLPH: That's where it looked like --

BURIL: The southwest corner would have been right in here. This is the Observational Instruments Laboratory here.

RANDOLPH: About where they looked like they were doing the backfilling, but then there was also a roadway that went out to the arroyo.

BURIL: Right. In fact, you can see, this is still a hill here.

RANDOLPH: Down in this area here with the yard, see in this area here, down in this area here where the road and other drifting comes out this way.

BURIL: This I think helps give you an example of why we throw up such a red flag at the idea of

going into the arroyo, because at that time JPL didn't control that. There was a dump there. And we know that there were dumps based on what we're seeing here in the aerial photos that JPL didn't control.

We go looking. We may find; we may not. But then what do we do? We don't know.

ROBLES: So we're going to make an addendum?

BURIL: Yes. I have no problem. Penny, it would be helpful to us in the specific areas that you'd like to see more detail, you don't have to do it now, but give us a thumbnail sketch of the kind of additional detail you'd like to have so we're sure to address what it is you wanted to see.

CUTLER: Peter -- an accepted proposal before we jump into the addendum.

BURIL: That's really what we'd like to do. Mark brought up a good point. That is, we'd like to have at least some form of approval of the proposal, at least the concept of what it is we're laying out. If you're going to agree to the idea that we need the pits, we can give you more detail to help that proposal out.

But if the idea of disturbed soil samples dug with a backhoe in a few locations that we think

we can identify is unacceptable, then we need to know that up front because we don't want to go through all the hassle of doing this addendum and then find out it was a waste of time.

Same thing for the OU-1 work. I think it sounds like you're a lot more comfortable with the first two wells now based on what we showed you today.

BISHOP: I would still like to take a look at the water level data.

BURIL: Which is no problem.

BISHOP: And what, at least we had discussed, is a written response to this after we talked today because we knew we were getting some more information today. And I'd like to take a look at the water level data before saying, yes, I think that those wells seem to be in a good position for that.

It would be helpful, and this might be -- now that we talked, we understand your rationale for it. When you do your addendum, the rationale for that is really more to determine is this contamination on that edge coming from off site or on site? It's not really an extent of your contamination.

BURIL: It was when we first thought about it. But then as we got into this and we realized that the water chemistries kind of played a role in this and pointed a couple of things out to us, it becomes, well, is it ours or isn't it ours as opposed to how far does ours go. I think that's no problem.

CUTLER: It does both.

BISHOP: It kind of does both, yes.

BURIL: I think we can point both sides of that out to some degree to make it clear. It answers both questions by doing this one thing, hopefully.

BISHOP: I guess I would caution you that when you do your actual addendum that you're going to want to actually lay out the kind of thing that you gave today, this is the water chemistry, this is the flow regime, this is the reason we're locating them here because of that.

Otherwise, it becomes what I thought was, well, we just kind of looked at the map and picked those two spots because it looked like they're easy to drill and they're kind of halfway.

BURIL: The point is well made. I don't think there will be a major problem with that. I guess the only question I have is that I don't know how

the agencies feel about taking data that we have currently that has not been presented in a formal RI report and utilizing that to modify an existing work plan.

BISHOP: I think there's no other reason for having these meetings if we're not willing to do that.

BURIL: I just want to be sure you're all comfortable with that.

ROBLES: That's right. That's right. That's why we need to --

BURIL: I have no problem with doing that. I just want to be sure the agencies are comfortable with that idea because what it's going to be doing is releasing this data out to the public in a non-RI format. If you're comfortable with that, I have no problem with it.

BISHOP: This is actually the only place where we don't have monthly reports of the data. All the other ones that I've worked on, instead of having -- we have monthly progress reports and quarterly data summaries all the time, throughout the whole RI. So it's just --

BURIL: No, that's fine. I'm a little surprised that people go monthly. I think our site is one

that doesn't carry the complexity that a San Gabriel site does, obviously. But if you think that more frequent meetings are something that would be of benefit --

BISHOP: No, these are not meetings. We get an actual monthly summary of what work they've done and a quarterly actual data.

BURIL: I see what you're saying.

BISHOP: All the data collected, all their hard stuff every quarter so that we actually have -- it's hard when you get this to make those determinations if you don't have the data that you used to make your determination.

BURIL: That's a fair observation.

NOVELLY: Do you want to break for lunch?

BURIL: I'd like to wade through this just a little bit further and then we can break for lunch because I think the rest of it's going to be pretty perfunctory. Your travel plans are basically set. You're staying down here, right?

LOWE: Yes.

ROBLES: Any further comments on OU-2?

BURIL: How about the monitoring program?

RANDOLPH: I have one real quick comment, Peter.

ROBLES: I'm sorry.

RANDOLPH: I'd like to take anybody and everybody from the agencies on the same tour that I took you and Judy and Chuck on.

ROBLES: I think it would be beneficial.

RANDOLPH: Because I think up until that time even maybe JPL didn't have the proper respect for all the problems that were out there.

BURIL: That's true. I myself -- here I stand, not NASA, but the JPL project manager, I didn't appreciate what we were dealing with out there until I walked out there in a mild rain at the time.

ROBLES: Thank you much, guys.

BURIL: I started walking up and down these slopes and realizing just what it was we were dealing with. It was very revealing.

ROBLES: I'm amazed at the erosion.

BISHOP: Actually, I go out there. I've been out there many times hiking around because I actually like the area up there and landed in these nice --

BURIL: Going up towards Stigers Canyon?

BISHOP: -- nice, almost quicksand material. You step in and go up to your mid thigh, like that.

BURIL: Oh, my God. Okay.

I guess we have an understanding of what

you need on OU-1, more background information there and more of the detail and supporting information for Penny on OU-2, which is fine.

Now, the last part of that thing was the monitoring program. And I'm wondering if we've got some comment, feedback on that.

LOWE: Yes. One thing I wanted to hand out to you guys is this long-term -- there's two copies here. It's a guidance that was put together by the California Base Closure Environmental Committee. It was composed of one representative from each of the Air Force, Army, Navy, EK Region 9 and DTSC and the Central Valley Regional Water Quality Control Board.

It's a fairly short guidance. It was designed for sites that are a lot larger than this. So I'm not going to hand this to you and say yes, you have to do everything that's in here. But I think there are a lot of good ideas in there that you can apply to your program.

On the last page it kind of shows a decision tree for how you decide that you are reducing frequency on your monitoring. One of the first steps is do you have four quarters worth of monitoring? Jon and I and Penny were looking at the data from your first two rounds of the RI data and

noticing that they were pretty highly variable. And I think it would be a really good idea to do four quarters of monitoring to see what kind of seasonal variations you're having before you really start talking about reducing frequency.

And then the next decision point: Is do you need that data for risk assessment? And I want to make sure that the people who are reducing frequency are checking back in with the risk assessors to make sure they don't need that data fed into their process.

BURIL: Let me ask you this, Debbie. The last decision diamond here says "near water production well."

LOWE: That's really used if you have an unprotected well and you're using your monitoring well as a guard well.

BURIL: Okay.

LOWE: If it looks like all of the nearby water production wells have water treatment anyway --

BURIL: That wouldn't really be the sole consideration, then; to determine frequency.

LOWE: Well, it's up to you. If you want an indication of how your contamination is related to the contamination in their well it might be a good

idea to do it quarterly. I think it's up to you guys to propose something.

Then this also talks about what should be in your quarterly reports, and it talks about putting together an annual report at the end of four quarters showing what kind of trends you've seen of the quarterly data.

And then the other thing is what your proposal seemed to do was put forth the wells that were going to be sampled. I think that needs to be relooked at every year. I think when your contamination starts to migrate either laterally or vertically you want to reconsider every year which wells you want to sample.

Does that make sense?

BURIL: Yes, it does. I'm just trying to think now.

Of the wells that we had that we proposed not to sample -- Mark, refresh my memory as I go along. We proposed not to sample 1, not to sample 2.

CUTLER: 2 has been replaced by 14.

BURIL: Right.

CUTLER: 2 has always been a problem.

BURIL: It was drilled too shallow. We hardly

ever get water in.

Well 9, did we propose to sample that one, or 15?

CUTLER: 15. They're up on the mound.

BURIL: They're up on the mound there. They've been non-detect all the way along so far.

And then the lower screens of multi-ports.

CUTLER: Depending on the well. I believe it was the bottom two screens on 3 and 4 and 14 and the bottom one screen in 12, I believe. Something like that. They've never had any detects at all.

ROBLES: Are you recommending, Debbie, just for one annual round of samples, to sample all of them and then come back per our recommendation?

LOWE: I'm not really familiar with what you did before this RI data. I know as part of the RI you're doing two samples semiannually. And before that were you doing quarterly?

BURIL: It was periodic but it wasn't quarterly.

CUTLER: Sometimes these reports caught quarterly sampling, but sometimes there would be two a year or sometimes three a year. It depended on funding and timing and various things.

BURIL: A variety of things that stepped in the way of an actual monitoring program. At the time I

believe -- Pete wasn't around. I wasn't either. But I believe there was some concern about spending money when it's not being made a requirement of a formal program.

ROBLES: Superfund process.

BURIL: People were wanting to get data, but they weren't wanting to commit to quarterly requirements, getting back to the concerns of taxpayer and why the hell am I paying for this if I don't --

BISHOP: Would it help you if we made it a requirement for quarterly sampling?

BURIL: As I try to pull my foot out of my mouth --

BISHOP: Actually, you said that, but every other site that I work on, that's the first thing we say, even the small plating shop. You've got to get one year of quarterly data so we can evaluate it.

BURIL: Actually, I'm coming to that question. If we take the decision trees that are identified here and if we take the very first one that says "Less than four consecutive quarters of sampling done, yes, go to quarterly sampling." If that's something that the agencies would impose upon us and if that was something that you would impose upon us

on all wells, all screens, then we would need to know that right now because that is a major increase in terms of the scope that we had initially planned for. We would literally have to go back and ask for more funding.

BISHOP: As I remember, the reason there was two sampling events in the RI was at that time that was all they could get scheduled before the RI report. That wasn't indication by the agencies that we wanted you to do semiannual sampling. It was that that's what you thought you could get in and we wanted to try and make sure you got at least one close to the wet and the dry. It's not a question that we agreed all you really ever need was two samples from these wells.

BURIL: No, that was never the thought.

CUTLER: But after that, the EPA did indicate that semiannual sampling would be acceptable based on what we found historically and during the RI. So that's why that proposal was proposed.

BURIL: I think it was Brian that had indicated that. At the time I think -- that might have preceded your total involvement in the project, Jon, when Hank Yocoub was sitting in on the meetings. When he had looked at the past data he had indicated

that some of these wells we need to evaluate the situation, but some of them look like you may not have to do anything more than annually, if you do it at all. Some of them maybe you should be doing quarterly. That's the kind of thing we were looking at.

Keeping that in mind, I guess the thing that we were looking at was, one, keeping in mind Brian's comment, at least what we interpreted as Brian's comment, and then looking at that past data. And I'm making an assumption here that all the past data is available to you in the work plans. I'm hoping that you've had opportunity to look at that to some degree, and I don't know what degree of familiarity you may have with it.

BISHOP: Not very familiar. I'll be perfectly honest. I look much more at the RI data because that's what we keep getting.

BURIL: Understood. Understood. It's reasonable.

But I think if we want to get into that, I think maybe -- let me ask you this: If we address the rationale behind the semiannual sampling, would that be of greater benefit to you at this point in time in understanding what our proposal is trying to

approach?

BISHOP: I think -- you jump in. On those wells that you have lots of sampling events and you've got a stable either non-detect on all of them or you've got a stable concentration, then you've got a reason to suggest that it's reasonable not to sample this on a quarterly.

BURIL: Agree.

BISHOP: The ones you've only got two samples on I feel uncomfortable saying that you've got a long-term history to say this is a reasonable approach. I get confused on which ones you have past history on, which ones you don't.

BURIL: I understand what you're saying, Jon. And it makes sense.

ROBLES: Yes. I'm serious.

BURIL: Peter hands me a note. I'm going to read this, if that's all right with you.

ROBLES: Go ahead.

BURIL: He just wrote down NASA Code JE wants four quarterly samples for one to two years before any changes to the monitoring program.

That comes as news to me.

Regardless, what that says is our headquarters environmental division is basically

saying do quarterly sampling.

BISHOP: I think that's pretty much universal.

BURIL: I don't have a major heartburn with that, to be honest with you. I think the only heartburn we're going to have is when we tell Hammond to get his checkbook out.

ROBLES: I know. But he's got to cough it up because the bottom line is if we go to, God forbid, and I don't expect this, but if we go to any type of disputes resolution on any issue, the first question my lawyer is going to ask is, "Do you have a quarterly sample?" We say "No." He'll say "Get out of here."

BISHOP: Do that first.

BURIL: "Go do that first and come back and talk to me."

ROBLES: More importantly is when we get to the ROD, "Do you have a quarterly sample program, at least one to two years of it?" "No." "Then I'm not signing this document. Get out of here."

BURIL: I think that's reasonable.

BISHOP: That's the same kind of thing that we were thinking is you come to the point where you want to sign a ROD, you got some samples, is it enough. We hate to delay it then for that.

BURIL: Peter, am I to take this, then, that what you want to do, then, is go with all wells, all screens quarterly sampling for a year?

ROBLES: One year.

BURIL: Do an annual report, evaluate at that time, and then make a decision on whether or not we begin to cut or increase.

ROBLES: Getting back to Debbie's question about reanalyzing the monitoring program, the department -- the federal facilities look at between three to five years to go back and review that. For example, if you do one or two years of quarterly monitoring sampling and you back off, then you look at your data when you go back because if you're changing, if you're doing what's right, you need to go back and periodically, a minimum of one every five years of quarterly sampling.

BURIL: One question I want to ask.

BISHOP: That makes sense. You go back once every five years and do quarterly sampling again.

ROBLES: Right. We've got one year or two years of quarterly sampling, then we change the monitoring program as we go along, every five years you go to one round of quarterly sample unless information to the contrary exists.

BURIL: You don't know if you can get the funding. Don't commit us yet.

ROBLES: I know that.

The reason for that is because even though you have a record of decision that has been approved, there are things that are changing all the time. If, God forbid, a plume comes off site, new technology comes in, you've got to determine, if new toxicology data comes in and shows that the risk assessments you did have to be changed, you got to go back to quarterly sampling. That's why, I hate to say it, but I know Chuck doesn't like to hear it, but I know --

BURIL: Doesn't bother me. It's not my money.

ROBLES: The thing is, the bottom line is it comes out my legal people just say it's more prudent. Yes, it's a lot of money, and so on. But in the end, if you don't give a "warm fuzzy" to the public, then it's not going to stand.

BISHOP: It's awful to be in a situation where you really think you understand the problem but you don't really have enough data at that point and you have to delay everything to meet that.

BURIL: There's a lot of good reasons to do it and very few that don't center around money not to.

RICHARDS: Don't say "all." There are wells now that we could get rid of.

BURIL: There are two questions I wanted to ask before you go any further. You say "all."

ROBLES: That's true. But the thing is, do we have at any time right now, have we ever done a full quarterly monitoring sample --

BURIL: Here are the questions I want to put.

ROBLES: -- per year?

BURIL: No, we don't.

Here's the questions I want to get answered. First, for those wells where we have ten or more sampling events or whatever range of time that those have occurred over, if we're able to identify those as having had, as Jon I think termed it, a stable environment, we understand what those are doing, I'm going to look at Wells 1 and 15 -- well, not 15, but at least Well 1 as an example of that.

CUTLER: The bottom screens for Wells 3 and 4.

BURIL: Those kinds of wells where we have at least seven or eight samples that show no concern, is it reasonable at this juncture to say that we need not be concerned at this point in time? Maybe we go back on an annual basis rather than cut them

out all together. But at least on a quarterly basis that we need not include those at the outset?

BISHOP: This is going to have to have other discussion. I think you're going to have to have discussion with NASA headquarters.

I would think that you're likely to want to sample everything for one year on a quarterly basis instead of having to say, well, we have quarterly sampling on this, this and this and we don't have any on this, this and this because we didn't think at the time this was necessary. But it's --

BURIL: I understand where you're coming from. This is more a question of perception rather than technical merit, is what I'm hearing.

BISHOP: You could probably convince me that you may be able to get away with not having this one screen sample for a quarter on this well because you have another well that's close by. But in general, I think you're better off doing one year.

BURIL: I understand where you're coming from. I think it is, in my own opinion, a question of the perception by whoever looks at the data that aren't skilled enough to understand what they're telling you, like a lawyer or the public or something like

that.

CUTLER: Just for future reference, the proposal there was conservative enough, in other words, we had contaminants consistently in the second screen, non-detects in the third screen for ten quarters. It was only the bottom two we were knocking off. So we would still have this ring of non-detects. Then if something showed up in one of those non-detects then the next screen would go. So it wasn't every screen that we never detected anything.

BISHOP: I know.

CUTLER: It was a conservative --

BURIL: We were trying to be conservative and at the same time I was trying to save my sponsor some money, is what it came down to.

RICHARDS: What is the point of sampling MW-3 and MH-1?

BURIL: We don't sample MH-1.

The second question I have of equal importance in terms of level of effort, are the constituents to be analyzed. We basically went out and looked for the world during the RI, and we found some things, obviously the VOCs, chromium in one well. But things like the semi-volatiles and water chemistries and so forth. Water chemistry I'm not

so concerned with, but the semi-volatile analyses and things of that nature.

Is it the collective opinion that we need to continue to look for everything that's been identified in the RI for at least one quarter? Or are we in a position now to be able to narrow our focus based on the information we have currently?

BISHOP: That will also depend on your discussion with your legal and your NASA headquarters.

But my opinion, a long-term monitoring plan is focused on those things that you've found. This is not really your RI work anymore. You're developing your long-term monitoring, which will change periodically over time.

BURIL: That's what I was hoping I'd hear you say.

ROBLES: It's also NASA's legal position as well, that once you've taken data and narrowed the focus, you focus on those chemicals that are the likelihood.

BURIL: Which is fine. I have no problem in taking that approach. I just want to be sure that everyone is understanding that when we come back with a program, that it may focus for the exact

reason we're discussing here, that we have completed RI work. We understand based on that RI work where we should be concentrating our efforts. And as such, you may see all wells being evaluated but those constituents being narrowed down dramatically.

BISHOP: I think it should.

BURIL: Good. I'm glad to hear that.

ROBLES: But, you see, the concern that NASA has is really not the quarterly monitoring sample. It's what are you testing for. Because that's where the cost of sampling becomes costly.

But basically, you know, you can't argue with our environmental people back there that you haven't taken a quarterly sample. But the key is they can argue with you moneywise and strategywise. "Taking a sample of the whole world? Are you guys crazy? Haven't you figured it out now? How much money have you spent down in those holes? You haven't figured out yet what you got?" That is why we couldn't stand the scrutiny of testing for the whole world.

BURIL: No. Not at all.

Okay. That's good input. We appreciate that very much. It helps us out a lot. We appreciate the guidance as well.

ROBLES: Break for lunch?

BURIL: I think it's lunchtime. Any objections?

LOWE: Do we have a lot more to finish?

NIOU: Risk assessment.

BURIL: Not a lot per se. We've already covered sections 4, 5 and 6. It's the other business, and that's more or less going over the action items that we had from last meeting and any other concerns that the agencies may have.

One thing that I would like to raise, and maybe this is something that we probably should talk about under other business, is the idea of what the Operable Unit 1 work and the expansion of the OU-2 work, the new work we're talking about as far as the boring 16 location and so forth, what that's going to do for scheduling and what kind of thoughts the agencies are having in terms of submission of reports and so forth. I know we had discussed that to some degree last time and you got a proposal from us. We're going to modify that now to some degree.

But I think it's important that the agencies realize that this is going to have a dramatic impact on schedule as far as the submission of a ROD ultimately and even on the internal steps leading up to ROD. We can give you some ideas of

what that's going to be. Even what we had planned for scheduling now is going to change based on what we talked about today and trying to fold everything together as efficiently as we can.

But I think maybe we might want to spend some time on that and it might be better to do that after lunch.

BISHOP: That's fine.

BURIL: It's now 12:15. Why don't we break for lunch, come back here at 1:00 o'clock. We should be able to go through it in an hour or so.

(At the hour of 12:18 P.M. a recess was taken until 1:10 P.M. of the same day.)

AFTERNOON SESSION

1:10 P.M.

BURIL: We're on line again after lunch. I think we finished off the proposal stuff and we have a number of things there to deal with.

On item 3, the risk assessment, I just want to reiterate that we had our conversations in early July, late June time frame with everyone, and one of the things that came out of that was kind of some questions about how we wanted to deal with the different sampling events, and so forth.

In talking about the kinds of things that we're dealing with now, one of the concerns that I have is when we're talking about the additional three wells and we're talking about additional soil characterization in terms of soil vapor and such, I think that one of the things that is going to be a concern for our risk assessment purposes is how you want to incorporate that data. In other words, first of all, how many rounds of data from OU-1, the three new wells do we want to have available to us to be able to incorporate into risk assessment.

And, secondly, given that there doesn't appear to be a risk, at least on the surface, from

the additional characterization of soil gases, do you want us to even incorporate an additional soil gas characterization around boring 16 in the risk assessment?

I don't know if you have some thoughts on that off the top of your heads. But this is the kind of thing I'm a little concerned about as far as trying to time the different things that we have to try to complete.

LOWE: I think I agree with you, Chuck, that from the deep soil vapor work there's really no exposure pathway to that except that it might be a continuing threat to the groundwater. So you probably don't need to incorporate that into the risk assessment. But I'll check with Dan on that.

BURIL: That's fine.

Now, in terms of the additional wells, I'm not sure how you want to approach that. I can see that as maybe being an issue, maybe not, depending on what we find.

LOWE: Right.

BURIL: That kind of puts a big kink into things as far as trying to get things rolling on risk assessment if we don't have all the data that we need.

I guess the best thing would be to ask you to go back to Dan and ask him about making sure we understand how that's all going to be incorporated, if it needs to be.

I guess we'll take it from there, basically. I don't know what else we can do.

LOWE: Okay.

BURIL: These are just a couple questions that came up.

LOWE: Penny, who is your toxicologist?

NAKASHIMA: Lara Volope. She does both human and --

LOWE: She does both.

BURIL: I guess that's really the only thing I have concerning that. It looks like most of the other ones we've probably gotten pretty well squared away. It was how do we incorporate the additional data and when to do so, if we needed to, and talk about even expanding that to a degree now, just trying to get a better feeling for that.

The last thing I wanted to talk about -- is there anything else from the other side as far as the risk assessment goes?

LOWE: Are you also asking about the off-base wells, how much data you need from there to

incorporate?

BURIL: Yes. Basically the whole thing is what I'm looking toward. How much do we need to have in order to generate that risk assessment. We've already basically gone ahead and set ourselves up to do two rounds of samples out there. We just finished the first one, or course.

The second one we are tentatively planning for another three months hence, so right around -- what did the schedule say? October?

CUTLER: Right. The schedule says October, November time frame for the next round.

BURIL: So we've got that on the plan right now.

The thing that strikes me now is that we had had a schedule that we were going to be looking at for completing the three wells and doing the arroyo work, and so forth.

Now, with an additional concern on the soil gas and the need to do some more characterization there and what appears to be a reasonable tie-in to where we want to place that Well Number 24 on the basis of what that soil gas work tells us, there is a concern on my part, at least, that the schedule we originally thought was hopefully going to be viable is going to be changed

to some degree now. Because now we're going to have to fairly intimately link the OU-1 and OU-2 information generation time frames to be sure that the OU-2 work is available to us when it comes time to do the OU-1 Well 24 location and drilling. So in trying to get all that together, our schedule just kind of fell apart here. We need to re-evaluate that.

I want to be sure that everyone would realize that the magnitude of the work that we're talking about is something that's going to take a fair amount of time to generate. And, in fact, on Operable Unit 1, we're looking at probably in excess of 18 months to actually have all the data and everything in place for just one round of samples from those three wells.

BISHOP: Now, that must have a large component of that in your contracting portion?

BURIL: Yes. About four months' worth.

BISHOP: We talk about doing six multi-port wells and having the RI finished in 18 months for other sites.

BURIL: I understand that. There is a lot of concern in the procurement aspect of this. In fact, my whole contract with Foster Wheeler, I have to

rewrite it between now and the end of the year in order to keep them on line. And then they have to rewrite all their things with all of their subcontractors, drillers and so forth.

We're essentially starting at ground zero because we did not take into account the idea of having to do additional wells to this degree. We had some contingency, but we basically have used that up now and we're in a position now of having to basically start over in large part on the contracting side of the house.

ROBLES: Yes.

BURIL: Yes.

RANDOLPH: I'm having a very difficult time conceiving why the location of 24 would have to be dependent upon any additional soil vapor work. If they're on the east side you've got 100 feet, maximum, of differences between two possible drill sites, and that's all you've got. You don't have access anyplace else.

BURIL: Well, I think that's one of the things that we probably have to take a hard look at. On the surface, at the outset of this thing, without going into great detail at this point, it makes more sense. And I think from a conceptual standpoint,

this is where Jon was coming from, that based upon where we find the soil gases are, the highest concern is going to be in large part where we want to put that well. Now, we may be constrained by access. That's something we're going to have to try and figure out.

I think before we make any commitments as far as where we're going to drill and whatever else, we need to take another good, hard look at what we're dealing with out there. I know you've done that already and I think that's something we're going to have to take another hard look at and be sure we've thought of all the possibilities. If that's true, then maybe we won't have to, at least at the outset. It's something that makes sense that we should consider doing and then going from there.

But OU-1 is the one operable unit that appears to have the most impact potential simply because we're talking about three additional wells and it takes a God awful amount of time to get those things in place, it seems.

CUTLER: If we wait for deep soil vapor data to put in the third well, you could have four or five months right there.

BURIL: We're talking, too, and we're hopeful

that, we'd be able to do the first two wells concurrently with the soil gas data so we can have those in place and the other ones come on line and the other information is ready to go when that soil data is done and we could put that third one in. We don't know if that's going to work.

RANDOLPH: Even if we get soil vapor wells in, the Board is going to be make us wait a couple months before we can sample them.

BURIL: That's another point. That's why I wanted to be sure we understood if we were following the same protocol we did before, and that was that once we completed the wells, having to use the air percussion like we did last time -- I think we waited two months before we sampled, was it, B.G.?

RANDOLPH: Yes. It was at least a good 2 months.

BURIL: Then sampling them or if there was another protocol that has come to light of late that would shorten that time or --

BISHOP: It's really hard to shorten it much.

BURIL: I agree. That's why I just wondered if you thought about it.

BISHOP: They're blowing air down there.

If you've got some information that we

don't have -- but we're not doing it to slow you down.

BURIL: Oh, no, no. I just wanted to be sure everyone realizes.

BISHOP: I'm just not sure how you're going to get a representative sample out of --

BURIL: I agree with you. I just wanted for everyone to realize that all the time frames built into this get very lengthy.

CUTLER: This is something I just haven't mentioned to anybody. What if we changed -- say the sonic drilling was applicable and would work, you're not blowing air. Would that save a few months?

BISHOP: Yes, I think it would. I think you'd get a much better --

CUTLER: Something we can look into here and see if it's viable.

BISHOP: I think your issue with the air, is it blowing air into the formation, you want to let that get a chance to restabilize or the equivalent.

BURIL: Okay. I was hopeful of showing you the schedule today, but now with some of these things I think I'm kind of in a position of wanting to stop and look at things like sonic drilling, look at the interrelationships of these things because some of

the points that have been brought up today are valid and really do need to be addressed.

ROBLES: Chuck, do you want to give them an idea of what we --

BURIL: That's basically what I'm trying to do. On Operable Unit 1 where we have the worst impact because of the number of wells that are increasing, and so forth, the contractual limitations we have, we are looking at 18 months minimum to get to the point of submission of the RI, and maybe more than that, depending upon how that works out.

Operable Unit 2, we're looking at, with the arroyo work, and it sounds like in concept we're still in a negotiation point, is we're probably looking, I'm trying to recall now, B.G., we're looking at close to a year on that, aren't we?

RANDOLPH: Or better.

BURIL: That's not including the new work we discussed today.

RANDOLPH: I'm trying to remember the old one, too, and I can't.

BURIL: We were looking at a year when we were talking about doing the work in the arroyo and adding that in and factoring that into all of our RI work and risk assessment, and so forth.

RANDOLPH: It's going to take a considerable length of time. It seems like a lot longer for the contractual process that will be to delay things by nearly a third.

LOWE: Is there any reason why we would want to separate the on-site sources from the arroyo and just go ahead and pull all of that data together in an RI?

RANDOLPH: It won't make any difference because there's a change in the scope of work in our contract with JPL. So they've got to --

BURIL: We would have to redo the contract anyway. Because if we went ahead and we did the RI we would then have to essentially delay for as long as it took to get the contract in place to do the arroyo work.

See, the problem that we have is we're faced with having to do distinct scopes of work, and the way that NASA contracting is, you have to have a set scope of work to be able to go out to a bid. You can't, say, drill up to a given number of wells. We could have said drill up to 30 wells and issued this contract for a million dollars. It doesn't work that way. It's got to be an absolute set scope. And when you go beyond that set scope you've

got to rebid it. That's the process that we keep falling into here, is that we add on and for reasons that are very valid, in my opinion, but then it's like starting over again. And it makes it very, very difficult to try to get things done in a fashion that allows us to move ahead quickly.

LOWE: Right. I was just thinking in terms of public perception and if there's any people out there who are concerned about the site has been on the NPL for a while, you guys don't have any RI reports to show for what you've done.

One option we could take is to take all the on-site sources, excluding the soil boring 16 where you're going to do more work. If you're going to do that as an EECA, you can pull that out, then your OU-2 work is essentially done and you can do the arroyo as something separate, then you have one document, one RI that's done.

BURIL: I can see that. But I guess one of the things that concerns me is that if we're going to ultimately incorporate the EECA work and expand that into the ROD, then we're kind of in a position of needing to incorporate it into the process essentially from the beginning. It's something I'm having a hard time visualizing how we could separate

it and still make it reasonable for ourselves to defend to the public.

The other possibility in terms of public perception is that there may be an opportunity here to actually set up a progress kind of a report to the public. I'm thinking of something in terms of maybe a newsletter or fact sheet or something that says we are continuing to work and this is what we've found out so far. Get the information out that way so people are informed.

You folks have been getting the information pretty much as it becomes available to us. There are long dry stretches here where information just isn't available here because we haven't got that much going on at a given time. But that might be one way to allay that concern. But I think in terms of the regulatory agencies' responsibility to get the process done, I'm very sensitive to that.

As far as the penultimate goal, which is the ROD, because we're seeing that stretch out now easily by a year plus on every operable unit we've got except Operable Unit 3. We still looking at March, April next year? Is that when we're talking about?

RICHARDS: Yes. Fine. I got another round of sampling to do. Validation takes three to four -- yes.

BURIL: Somewhere in that time frame. It's about what we had planned. Actually, we maybe got the second round built into this at the last meeting. But the two where the scopes of work are increasing, I just want you to recognize that the penultimate goal, the ROD, is stretching that out a ways. We want to try to re-evaluate all the things we're doing now in terms of the soil gas work and the timing of the wells and the risk assessment and incorporating that data, and so forth, so that we can come up with the most efficient schedule that we can and then building into that all our constraints on procurement.

I've been in this for 18 years and, I tell you, this is one of the most nightmare procurement cycles I've ever seen in my life.

BISHOP: Peter, you've been involved in some other sites with NASA. Is there anything NASA has done to try and streamline it? I understand the process is there. Sometimes they recognize it at other sites.

ROBLES: We have tried to at other sites. I

know that the JPL site which I'm responsible for we've done some service centers where the procurement process has already been done, where the contractors are on board and where all we do is send the money. They obligate it within 60 days.

BURIL: We're doing our part of the Edwards Air Force Base that way.

ROBLES: What we've done is to put in our request, within a couple of months we get the money, have it sent down to Brooks AFB, in a couple of months get the contract on board and he's got a scope of work and that's sent directly to the regulators, and so on. That's the easiest way to do it.

The only problem is that since this is a JPL and we've contracted with the prime contractor, Cal Tech, everything must go through them. And that's where the process lies.

BURIL: There are a lot of contractual requirements between NASA and Cal Tech and then imposed upon NASA by the FAR that requires all these steps that we go through.

ROBLES: These steps are not specifically for this.

BURIL: No. It's general.

ROBLES: It's because of the way that most of the work they do they contract out as well. So we have to make sure.

BURIL: For example, all of the subcontracts which Foster Wheeler lets, we have to review and then recommend approval to NASA. They, then, have to review and approve those, and then we can turn them loose. So virtually every subcontract they do, laboratory, drilling, survey, I mean, you name it, everything has got to go through that process. It's long, it's lengthy, it's painful and there's not a damn thing we seem to be able to do about it.

BISHOP: I just wanted to see if it --

BURIL: It's a good question.

BISHOP: Because we've run into that same thing in the State, and sometimes with specific things they've come up with some expedited system because of the impression that nothing is happening.

BURIL: Exactly.

BISHOP: I'm not all that concerned about when the ROD gets signed and when the RI gets signed. I just want to make sure that we're not --

BURIL: Things are moving.

ROBLES: If this were a NASA site we could do some things. But because this is an FFRDC, Federal

Facility Research and Development Center, it's a different type of relationship here. It's a very strange type of relationship in many respects. It's mutually beneficial. And there are certain things that go between NASA and the prime contractor that is not -- the relationships of trust, a certain amount of give and take, it is not within the contract. A lot of it is as you go along. Because we're talking about space, exploration, satellites. That's where the whole issue of contracting comes here. That's what it was designed for, not for this.

BISHOP: Yes. Obviously.

I'm just going to make a suggestion that I expect that Debbie is going to get the most pressure concerning the schedule. It may be at some point beneficial to her if NASA or JPL, probably JPL, could develop just a short kind of --

BURIL: Explanation of why.

BISHOP: -- this is our contracting process, this is what has to go through. This is -- you know, we have specific with NASA and this is the relationship.

Because otherwise she's in the position of, well, we have 10-mile square sites that are from

start to beginning in two years. What do you mean just putting in three wells it's going to take 18 months?

BURIL: That's understandable. I know Debbie has got a bad situation there, I think, at least in terms of trying to compare this to a DOD site where these guys have got DERA funds out there that "Now, it happens."

ROBLES: That's the other issue, is we do not have DERA funds.

BURIL: No. We've got to actually go to Congress and get these things on a yearly basis.

ROBLES: It competes with the normal maintenance and construction. If we were DOD we could line item the request for funds.

BURIL: We don't have that opportunity. In fact, it's interesting. I'll give you an example. JPL has, I think in 1997 or 1998, a $15 million new construction and environmental funding coming from NASA, approximately. Of that they basically threw all of that into one big pool and said you have to take everything out of that one pool that you want to do and, by the way, you absolutely have to spend the money that you said you need to spend on environmental, which is about a third of it. So

that leaves 10 million left for the entire facility, including Goldstone and two DSN sites that are in foreign countries.

And it becomes a real interesting challenge to see which thing we do first, because the money just isn't there. So we are fenced. We actually get our money first, but in that regard, it just keeps getting tougher and tougher and tougher and tougher to get money. By the end of this century, this millennium, we'll be 6 billion less than we were now. 5 billion.

ROBLES: We're going from a budget of 14.8 billion to maybe down to 11.2 billion.

BURIL: Anyway, that's the sob story from NASA's perspective, but it's to try and help you understand some of the things that we're facing.

RANDOLPH: I got one more for you. If we want to go out and drill the new wells, you could ask us to do that tomorrow and we could make contract modifications with our subs because they have not issued a final invoice. We're going to have to go out to bid again and solicit bids, go through the whole contract modification for any soil work.

I could install more soil vapor wells right now because the lab is still on line. But

getting the holes drilled is another story.

BURIL: If, Debbie, that would be of any help to you, Jon's suggestion --

LOWE: I think that eventually needs to become part of the full extension of thoughts when you're providing the justification for why you can't meet the FFA dates. It would be really useful to throw in discussion about --

BURIL: That's fine. I have no problem with that.

Let me ask you this. In terms of that letter, because we are well beyond the dates that were already identified in the schedule. And we identified those in previous RPM meetings as not going to meet them. We have never made a request for a schedule extension because the schedule assumes that we understand what the scope of work and the timing of the work was going to be, and that's still something that seems to be evolving.

When are you anticipating that we need to generate that? At the time that we're making a final proposal? Or when are you thinking of?

LOWE: To date I think you've only missed one date, right, and that was OU-1 sometime in May of '95.

BURIL: Right. I think OU-2 is coming up in October.

LOWE: I think you need to get a letter out ASAP. Because I think it puts us in a bad situation for not enforcing the FFA.

BURIL: I understand.

LOWE: I think the FFA is very specific about the only way you can miss that date is if you have a written letter in to the other parties. And I recently had the I.G. in my office for Mather saying, "Okay, here is the schedule. What day did you get the documents in?" If they did the same thing to me on JPL, they'd go, "Now, why haven't you issued stipulated penalties?" And just showing this transcript isn't good enough.

BURIL: Sure. I was going to say that perhaps that you've received these as official project documents, it indicates that we've told you that and it's documented in that fashion. It might help you a little. I'm not saying that's the solution, of course. But I think that should be pointed out that those are official documents and that an awful lot gets discussed in these meetings that has major impacts and the I.G. should not be allowed to close their eyes to the idea that this has been discussed

and people are knowledgeable what's going on and it's been documented and is capable of being referenced back to.

But from my own experience with auditors with GAO, the DCAA, the I.G. and God knows who else that steps through these doors these days. But that will hopefully give you enough help there.

I think one of the things we'll try to do as rapidly as we can is to formulate our own approach on dealing with the things we talked about today and then as part of the modified proposal that we'll put out there we'll put in the schedule that we're anticipating and in recognition of the schedule modifications as required by the scope change, and as part of that the contractual problems that we face in having to go through all the iterations again. That's hopefully enough justification to be able to lay out the new schedule and get the new dates in place.

Okay. Great.

Schedule keeps me awake at night, guys. I got to tell you that. Drives me crazy.

LOWE: One thing our office likes to see when they see like these long extensions is something that you're trying to do quicker. So I think if you

guys could offer up the EECA, contrast your time schedule, I think that would make these schedule extensions more palatable to our office.

BURIL: That's fair.

There's nothing wrong with that. Okay.

I guess that's about all I can say on schedule until we get things together. So everyone is aware we're doing our best. It doesn't look like it some days, but we are doing our best.

That's everything I had on other business. I guess we're down to the last, then. Does anybody else have anything else they want to bring up?

Then I will just take up the action items that we had from the last meeting quickly and be sure we've gotten everything covered, and we'll be in good shape.

The first action item is that we were to provide a letter proposal for the arroyo investigation. You've gotten that, and we've talked about that at length.

Also a letter proposal for the OU-1 wells. You've gotten that. We talked about that at length.

Provide a schedule plan showing how the rest of the project will be laid out. That's changed now. We'll be doing that with the

modification of the proposal and laying that out for you.

Foster Wheeler will do a presentation of the overview of the data and walking through the RI verbally. We did that to a degree today.

Was there anything in that that you saw you felt you needed more information down the road on? Was there anything we could help you improve on that?

BISHOP: Maybe not more information, but we did discuss having the information you used to come up with the background for us.

BURIL: Certainly. We can get that to you. That's not a problem.

CUTLER: We can give you that today if you want. There's a repro machine just right outside. We can do that.

BURIL: We can give you that sheet today.

NASA will send a long-term monitoring proposal. We've done that. We've discussed that. We've got our guidance now that we can look to and our environmental division telling us to go do the quarterly monitoring, in essence. So it looks like we'll be modifying that.

And then we were going to set up a telecom

for the risk assessments. We've done that. That was late June, early July, the one that we talked about briefly here.

And the last one was -- this one was kind of a gray area. Brian had indicated that he would be willing to go and talk with, I guess, Karen Goldberg. Is she still the attorney on this particular site?

LOWE: I'm not sure who the attorney is. What was the question?

BURIL: The question was, given that the arroyo was a multiple user kind of area, how much guidance, if any, can you give us as far as how EPA or any of the other agencies have handled this kind of a situation in the past?

I think we've probably ground your ear off enough regarding what our concerns are. I hope you're understanding where we're coming from. We'd just like to know if there's any precedent that we might be able to look to and understand how best to deal with this kind of thing.

And I think that was it.

NOVELLY: So today's action items were that NASA, JPL and Foster Wheeler will discuss the interim removal action for carbon tetrachloride in

the soil vapor at Well 16.

We're going to give the agencies the aquifer testing data, the water chemistry data and the water level table with the elevations for each sampling event.

We're going to change the letter proposal for the arroyo investigation to show how each episode of dumping or spillage is referenced and responded to.

Penny is going to let us know what additional detail she needs to know in that proposal.

The agencies have promised to give us a written response to the proposal, I guess after we modify it.

We'll redo the proposal to include quarterly sampling at the wells. And I'm a little bit up in the air here. We initially said all wells, all screens. But are we still doing that, all wells, all screens?

CUTLER: That's the last I heard.

BURIL: That's the last I heard. All wells, all screens, with a focused suite of constituents.

NOVELLY: For one year before deciding which ones will be included in a long-term monitoring

program.

Debbie is going to get back to us with responses to Ann Lehurray's questions on the risk assessment.

We will develop description of the procurement cycle and factors. Do you want to do that?

BURIL: We won't make that an action, but we should make that part of the requirement of the new proposal. So that's justification for the extensions.

NOVELLY: We'll send a written schedule extension request letter.

BURIL: I think we can combine that with the proposal, can't we?

LOWE: Yes. That's fine.

BURIL: Okay.

NIOU: In addendum form?

BURIL: No, no. What we're going to do, just so everyone is clear, the proposal that we put forth will be modified and a, quote, new proposal will come out laying out how we want to do this. In that we'll give the extension request and the justification for that. And then based on that proposal we would hope to obtain a written response

back from the agencies saying "Yes, this is good. Go do it." When we go to do it, we would then use the mechanism of an addenda to the appropriate FSAPs and work plans and go ahead and formalize the change and then go do it.

NIOU: Okay.

NOVELLY: That's all I've got.

BURIL: That's enough.

Anything else before we say thank you all?

RICHARDS: The written approval from the agencies is what initiates the procurement?

BURIL: Yes. That is one point I have to make very clear, is we need to get the written approval from the agencies because I cannot convince a contracting officer that going out on a scope of work that has not been approved is something that's prudent to do.

LOWE: Okay.

BURIL: So I have that as an absolute restriction. I cannot get it past the contracting officer.

BISHOP: That's good to know that you can't start the process until you've got the finalized approval.

BURIL: I just want to be sure.

NIOU: One last question. Because of what Mark presented today, it seems that some sort of modeling may come up in the future to prove or disprove the connection between Well Number 10 to either on-site water or off-site water from La Canada. Is that true? That's from what I hear.

CUTLER: Groundwater modeling?

NIOU: Yes.

BURIL: We're already in that process. We're taking all this data, and I think almost hopefully within the next few days. We've met with an outside entity outside of Foster Wheeler who does a great deal of this kind of work. What's their name? Metropolitan?

CUTLER: Multimedia. They're groundwater modeling experts. I don't know if you've heard of Parviz Montazer. He's going to be doing a model for JPL primarily designed for designing remedial systems and maybe a little bit of fate and transport.

BURIL: This fate and transport aspect will be one thing we hope we can incorporate into that model. We don't know at this point because I think the discovery of a lot of this stuff is relatively new in terms of how we could best incorporate it

into the modeling effort. The modeling effort was one that was focused on trying to be sure any remedial system we put in place is going to be effective given the varying conditions that we face in the arroyo.

CUTLER: The longer scenarios.

BISHOP: I just have been through this in two operable units in San Gabriel concerning the use of modeling. As I think with this project, the EPA can require a model to be -- that could -- and so you have two choices in your approach. One is you can use the model for your own internal feeling good about things but not utilize it at all in making any arguments to the agencies, or you can use it for making arguments to the agencies, in which case we would like to have some involvement in the parameters that are used and how those were decided and the code. It becomes a whole different subject when you're deciding to make it a part of the whole project.

I'm letting you know these things up front.

BURIL: No, we appreciate that.

One thing I'll mention, and I don't know to what degree this will have an impact on anything

in the future, but I believe we identified in the work plan the modeling effort that we were planning to undertake, at least in concept, and that we identified the code there and we identified the mechanism we used to select the code. And basically that was it. I mean, we had not progressed nearly far enough to understand what we're going to do with it.

BISHOP: We're not saying we need to have any input on what code you use.

BURIL: Oh, okay.

BISHOP: If he's going to use a proprietary model that he developed, he's going to have to provide it. If it's going to be one that's a public access, then we have access to, then, you know, we would then use that. I don't know --

ROBLES: Do you have a criteria or standard?

BISHOP: You know, I will look back at what we've done. It really wasn't a criteria or standard. It was more like, okay, let's make sure we're all in agreement on what's going into the model and how it's being utilized so there's no battle at the end between your model and a model we then have to develop to fight it.

BURIL: Just to give everyone, hopefully, a

"warm fuzzy" on this, the model that we're using is called MOD-FLOW, which I think everyone is familiar with. I think we're starting to consider using Rand 3D as a particle tracer as part of that. Is that right?

CUTLER: I'm not certain.

BURIL: That's the name I recall, Rand 3D for the particle tracing of this. Hopefully it's in the fate and transport portions of it.

And we are planning on basically going through the entire site as a unit rather than by operable units. And we've done some preliminary work. In fact, some of the preliminary information gives us some pretty good understanding, at least conceptually, of how these flow reversals seem to happen, which is kind of nice. The model is telling us similar things that we see in the field. At least the first good step in calibration in the model. And we have done verification runs in the model, and so forth. So we have all that documented so we can show you the model. We can show you what we did to make sure the model was working the way it was designed and then how we calibrated it to our specific situation and then what it told us once we started plugging in data. So hopefully it will be a

clear enough trail for you to follow.

Is there anything else?

LOWE: Do we need to pick some dates for the next meeting?

BURIL: Actually, we need to pick two dates. I'm glad you mentioned that. The first date, if you don't want to make it today, is a date that I would hope we could get the agencies down in the arroyo and see what that place is like. I think that would be an extremely valuable lesson to you.

And the second one would be for the next RPM meeting.

As far as setting a date now for an extension letter, I'm going to ask that we postpone that a little bit because I need to understand how we're going to pull all that together in terms of the changes in the scope. So I'd like to defer that, if it's agreeable to everybody, for the time being.

Given the hour and your prior commitments, I guess spending an hour going down to the arroyo today is probably not feasible.

LOWE: I've been down to the arroyo last time we were out here. So if you want to just take --

BURIL: Did you actually see the areas that

we've been talking about?

LOWE: No. Actually, I didn't.

BURIL: Is it something that you personally have an interest in seeing?

LOWE: Sure. Sure.

BURIL: Then, I don't know, given your prior commitment, I don't know if you're willing to do it today or if you want to come back or how you want to do it.

NAKASHIMA: I can't do it today.

BURIL: You can't. Okay. Penny, I think you're one of the key people. We've got to be sure that you get down there so you can have a better understanding of what we're concerned with. And hopefully that might allay some of your concerns about what we've been raising as our concerns.

RANDOLPH: It's not just going down in there and looking, too. Part of the educational process is having to look at the aerial photos that were made over the period of years from the time that the Lab --

BURIL: Basically drag you to this place and that place.

BISHOP: I think that would be good.

RANDOLPH: And you can see all the areas that

have been mined for all the sand and gravel, which turned out to be a lot more extensive than what was first envisioned.

LOWE: How about the week -- or right after Labor Day?

BURIL: I'm going to be on vacation then.

RANDOLPH: Thank you. So am I.

BURIL: So that one, unfortunately, doesn't work very well.

RANDOLPH: The first two weeks in September following Labor Day I will be gone.

BURIL: B.G., I have to say, is possibly, besides yourself, the most critical player in this. If I'm not there it's not critical. If he's not there, it's a waste of time.

LOWE: Okay. Third week in September, the week of the 18th?

BURIL: That's fine with me.

RANDOLPH: Fine by me.

BISHOP: As long as it's not the 19th.

RANDOLPH: I would love to make this trip as soon as possible, but my absence is beyond my control.

NOVELLY: Go ahead and tell them. His daughter is getting married. He can't skip that.

BISHOP: Congratulations.

How about the 20th?

BURIL: September 20. Sounds good.

RANDOLPH: Sounds good.

BURIL: Let's do it.

And then the next RPM meeting, if we maintain our schedule as it has been, would be in November. But that would end up putting it at the end of November, which is the Thanksgiving holiday. So I would suggest that we do it before Thanksgiving before we get tied up in the holiday mess.

ROBLES: Yes.

BURIL: So I believe Thanksgiving this year is the 23rd-24th or 22nd-23rd?

NAKASHIMA: 23rd-24th.

BURIL: I would suggest no later than the week before. That leaves that holiday weekend open for whoever wants to be on vacation, or whatever else.

LOWE: The 15th? It's a Wednesday.

ROBLES: Sounds good.

BURIL: The Ides of November. All right. Sounds good.

BURIL: Have we covered it?

RANDOLPH: Time for the meeting on the site walk or the arroyo walk?

BURIL: 10:00 A.M.

RANDOLPH: 10:00 A.M. Okay.

BURIL: Give these people a chance to get here comfortably. They have to fly and everything.

ROBLES: Remember, B.G., if anything happens to them, it's your fault.

BURIL: We'll arrange to drive the snakes away.

If there's nothing else, then, I guess we're done.

(The proceedings adjourned at 1:54 P.M.)