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REMEDIAL PROJECT MANAGERS' MEETING

NASA/JET PROPULSION LABORATORY

ROOM 801

11 MAY 1995

ATTENDEES:

Peter Robles, NASA

Charles L. Buril, JPL

Judith A. Novelly, JPL

Brian Swarthout, US EPA

Jon Bishop, RWQCB-LA

Penny Nakashima, DTSC

Stephen Niou, URS

Dan Melchior, Foster Wheeler

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Mark Cutler, Foster Wheeler

Vince Richards, Foster Wheeler

Doe Huff, NASA

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I N D E X

Pasadena, California

9:41 A.M. May 11, 1995

ROBLES: We're calling the RPM meeting for May 11th of JPL in Room 801. The time now is approximately 9:45.

NOVELLY: I'd like to ask everybody, since we're using a court reporter today and we're just getting into this, would you mind just stating your last name before you start talking just for the beginning of the meeting until she gets to know you. Okay?

ROBLES: Do you want us to go around?

NOVELLY: No. Just when you start to speak.

ROBLES: I'm Peter Robles, and I am the RPM manager for NASA overseeing the JPL location.

1. REVIEW OF PROJECT

ROBLES: We'll start our agenda. Basically it is reviewing of the projects. And I'll turn it over to Chuck Buril for that.

BURIL: Okay. I'm Chuck Buril, as all of you may be painfully aware.

I'll just give an overall review of the project real quickly, then I'm going to step into

the individual pieces of information you have here in the package.

As it stands right now, all of the Operable Unit 1 work in the field is essentially done with the exception of the additional work which was discussed at the last meeting and what we got the letter on from you folks.

We also have completed all of the Operable Unit 2 field work. That includes the soil gas sampling and analysis. The soil sample analysis is completed and is currently in data validation right now.

And the Operable Unit 3 work is moving along at a fairly rapid pace. All five wells have been drilled, cased and backfilled. We are in the process of developing three of those simultaneously right now. If you have an opportunity to drive out on the Operable Unit 3 area you'll actually see three of the locations undergoing well development as we speak. And the remaining two are complete and ready to sample.

So that's an overview.

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2. OU-1 1ST ROUND RESULTS

BURIL: I think one of the things I'd like to do, then, is to just step into the second item on the agenda, and that is the Operable Unit 1 results. What you have in front of you here is a compilation of all of the results from the Operable Unit 1 well sampling. This is both organic and inorganic. And what that is, basically, is fully validated data at this point. This is what we intend to use for our further analysis and the risk assessment and feasibility study portions of the project, the same kind of things that you saw before when we spoke last. There were no major changes in terms of the constituents or the concentrations. And we are still looking at what I term the quadrilateral area at JPL. And, again, that extending from, when you look on the map, Wells MW-7, MW-8, MW-13 and MW-16 as being the principal area of contamination, the principal contaminants being TCE and carbon tetrachloride, with minor amounts of other constituents that are identified here on the tables.

We're basically in a position of having what appears to be a volatile contaminant concern here. We did not find anything in the semi-vols or

the metals that we think is a concern in terms of a remedial action. You'll see some lesser numbers of different things here off to the side as semi-volatiles, but they are things that could be easily Laboratory contaminants or other types of organics that are being identified by the GCMS method. None of them that we could identify were above any MCL, as I recall.

Is that correct, Mark?

CUTLER: Right, as I recall. Most of it's blank contaminants and will probably fall off the list.

BURIL: When you're looking at the metal scans, I believe we had only one location where there was a potential concern, and that was at our Well Number 13 for chromium. And we showed there a 0.26 hexavalent chromium number. As I recall, the limit is .005. Is that correct?

CUTLER: There isn't one for hex chrome that we could find.

BURIL: It was total chrome?

CUTLER: For total chrome. It was .05 for the State and .1 for EPA.

BURIL: .05?

CUTLER: Yes.

BURIL: Then my first analysis appears to be

that we do have a total chrome concern if it's .05. We have one, two samples there show very slightly over that, but nothing of any grand magnitude per se. And whether that's an issue for concern I think is going to be something we'll have to evaluate down the road.

Virtually everything else is within normal parameters that I was able to see. And I'll ask Mark to back me up on that.

CUTLER: Right. The only other lead, or the only other number out of all this was one lead that was .051 and the MCL was .05. And that was not repeated in the second sampling round. So I shouldn't even mention it because it's probably --

BURIL: Okay. So basically, it appears that we have a volatile organics potential concern here, and the principal contaminants, again, being the carbon tetrachloride and TCE.

Interesting thing, again, to note, same as we discussed last time, is that the areas to the east and to the west of the Lab appear to be clean, that both rounds of samples showed volatile organic compounds present in non-detectable concentrations or concentrations below the MCL.

The only one that was a potential concern

was at MW-10, and if you look at that particular one, carbon tetrachloride was right at the MCL for the first sample. The second sampling was non-detected. The TCE was present at concentrations that were above the MCL for both sampling events.

You'll notice there, too, that we did a high and low flow rate. That was an attempt to determine whether or not the pumping rate of the sampling would have an impact on whether or not the concentrations would vary. And if you compare the numbers on TCE between high and low sample rates on the given dates, you can see that there's essentially no impact at all.

Now, one of the things that I did want to talk about in addition to the results here, then, is the discussion that we had at the last meeting regarding the installation of additional wells. And those being proposed by us at the time were between the quadrilateral and Well 14 in an attempt to determine what the bound, if you will, or the gradation of contamination from the quadrilateral out to Well 14 was, and also to the south from the quadrilateral down toward MW-10 for the same purpose, to try to better define what that gradation from the quadrilateral to that location was.

We had sent you kind of an outline proposal, and I don't remember who it was. Brian, you responded back with a letter that you and Penny had spoken and ultimately got together with Jon and were recommending three wells. Is that correct?

SWARTHOUT: Yes.

BURIL: And that the third well that you were recommending was to be placed more or less in the middle of the quadrilateral. I'd just like to get a little background on that, if I might, as to what your immediate thinking was for wanting that well. I think I understand, but I'd like to get it face to face and make sure what it is that you're thinking.

SWARTHOUT: Well, we were just thinking that since the four wells that are in that area are all water table wells, if I'm correct --

BURIL: Yes.

SWARTHOUT: -- that that well would be used to determine the vertical --

BURIL: Vertical extent of the contaminants.

SWARTHOUT: -- extent of the contamination.

MR. BURIL: We've taken a look at that, and actually I think we concur in large part with the recommendation. In fact, we've gone ahead and tried to come up with what we think will be a reasonable

approach on how to deal with installing those three wells. Let me just hit the highlights.

In the map that we sent out we had identified, I'm going to go my memory and someone correct me, please, if I misstate it, the well between the quadrilateral and MW-14 was identified as 21? Do you recall that, Mark?

CUTLER: I don't remember. Actually, it was 24.

BURIL: Excuse me. 22.

CUTLER: 22, 23 and 24. I believe 24 was the one that --

BURIL: Is the one in the center, as I recall.

CUTLER: Right.

BURIL: Do you recall which one was which from the others?

CUTLER: I believe 22 was to the north and 23 was the southernmost.

BURIL: Down to the south. Okay.

At Well 22, which would be placed -- well, I'm going to go ahead and point at the map here so we can all have a frame of reference.

Well 22 we're planning on placing in this general area here. Now, this is actually a parking lot. In fact, if we walk out to the back of the building, I can actually show you the site. It's

the only one in the area that we're aware of that has little or no concern with underground utilities.

I believe that in the letter you were talking about somewhere up on Explorer Road here for a well. The problem that we have with Explorer Road is that that is just laced with all kinds of underground utilities, everything from fiberoptic cable to sewer lines. The concern being that many of the things that run down this -- you can see it's more or less the entire backbone of the entire Laboratory here. Anything that might be potentially disturbed would be very, very damaging to the operations as a whole for the Laboratory. And as such, we were thinking that trying to get as close as we can to that in an area that is not going to be an impact to Lab operations led us to this location right here. It's also convenient, too, because the Director's office looks right out on it. So it would be kind of fun for them to know what's going on.

We are planning on a well depth of approximately 500 feet total, and in that depth we would plan to place three screens and we would use the same criteria for placing the screens that we've used previously. That will be, of course, based on

well logs and field observations of the type of lithology that we're dealing with.

For Well 23, back to the map again, again we're looking at an area generally in here is where we'd like to place it. We initially thought somewhere in this area here, but, in fact, again, we're faced with a situation of having a great deal of utilities in the area. We're constrained in large part by the buildings here. This building is where we actually assemble the satellites, so we don't want to disturb that in any great way. It's also quite large. This one is as well. It's our central engineering building. This is our machine shop here.

So rather than trying to focus in a very narrow area in this general vicinity, correct me if I'm wrong, guys, we're actually looking at moving it slightly over into this area here where there is a parking lot where we can get away from the buildings and the utility concerns and so forth.

The lateral displacement shouldn't be enough to really make a difference as far as location of contaminants. We're talking in the neighborhood of 100, 150 feet.

And if there is a real contaminant concern

coming from that quadrilateral down to the south there by Well MW-10, we should be able to identify that well at that location.

The construction, again, would be very similar to what we discussed for 22. Total depth of approximately 500 feet, and three screens placed again using the same criteria that we established for all the multiport wells thus far.

Now, you may wonder how we established that particular level.

The way that we actually established the depth was trying to draw a correlation between what we see in the current standpipe wells and out to the different locations that we're concerned with. What we did is for Well 22 we took the bottom of the screen at MW-7 as a given elevation, and then went to the bottom screen of the multiport well, MW-14. That gave us the slope of the line. And then accounting for topography changes across that line we were able to show that you come down to approximately a 500 foot total depth you would actually reach that bottom screen. The reason we chose the bottom screen at MW-14 is that has been clean. So we would expect if there's any contaminants moving in that direction that the

bottom of any potential plume would be above that level. So we should be able to penetrate anything in that regard. We follow the same kind of logic between MW-5 -- was it 5 or 4, Mark?

CUTLER: 4.

BURIL: 4. Excuse me. With MW-4 using the bottom screen of that and the bottom level of MW-7 on that one as well. So that was the fashion we came up with the depths of the wells.

On the last well, MW-24, we're basically talking about trying to put it right in the middle of the area. And Mark or B.G., can you remind me? I'm having a hard time remembering exactly where we talked about placing that one. Was it up in this area here off of Explorer Road?

RANDOLPH: They suggested Building 91, which is a small structure there which is going to be demolished shortly. There are some old building foundations in that area, but nevertheless, between the upper road and Explorer Road is a fairly steep slope.

BURIL: Right in here.

RANDOLPH: Yes. There's a little road up there. But the major flat spot that we have in the area is down to the left at a location for old Substation C,

right there, alongside that fence line. It's not a very big area. But that would be about the best place, or the parking lot to the south of that street on the same corner. That's about the only areas where we could extensively put a well in in that whole area.

BURIL: Once again, we're talking about being right on Explorer Road, which is, again, kind of the spine of the Laboratory as far its transportation route. So we're looking at placing it in one of those two areas. Again, the rest of the topography and the access issues are ones that prevent us from going anywhere else.

We're planning on drilling that one a little bit deeper. We're actually thinking around 600 and 650 feet, and that's due principally to the topography differences that we see between the lower part of the Labs where we're talking about the other two wells, and also to account for the possibility that we may have contaminants at a deeper location, since that is at what we believe to be the source area. And we're planning that total depth of 650 feet with four screens installed as opposed to only three. It gives us an added insurance, if you will, to be sure that we've got enough in that area to try

and identify where the actual extent of the contamination is in a vertical sense.

I'll talk about schedule when we get down to the last thing on the agenda since all of these tend to tie together and it makes it a little easier for you to draw it all together when I present all the schedules at one time.

ROBLES: Any questions on OU-1?

SWARTHOUT: I think it's good to put a well in the area around MW-7 and 8. I'm wondering, is it possible to move it to the other end of that quadrilateral?

BURIL: I couldn't say, to be honest with you. We'd have to go up and look at the area. B.G., you're very familiar with the area.

SWARTHOUT: It seems like the groundwater is flowing in that direction.

BURIL: In that direction.

SWARTHOUT: It seems like it would be more reasonable, if you're going to have it on the extreme of the quadrilateral, then it would be better to have it on the east side.

NIOU: Which way are you talking about?

BURIL: Toward 264 and 177.

SWARTHOUT: MW-24.

RANDOLPH: There's one area to that eastern section where that might be possible. We'd have to kick out the transportation pool off of that parking lot, which is right here.

That's the only location. This is a very steep road. This is a very narrow road. You can't block it. This is a small parking area out in front of Building 18, Explorer Road. Everything else is pretty dead in the water. That's the best bet we have. Otherwise, from there you're going to have to move down into this area outside of that quadrangle.

CUTLER: Or just to the north, that parking lot just to the east of MW-7.

RANDOLPH: Up in here?

CUTLER: Right in there.

RANDOLPH: Okay. This is also the transportation yard where they keep all the trucks and buses and everything there. This is a public parking lot or employee parking lot. But this is basically designated for the transportation department. That is a possibility. But this is probably the best bet.

BURIL: Again, you're in an area there that's really highly developed. In fact, if you have the time and the desire, we can actually take a walk up

there. It's not that far from where we're sitting. And you can see what we're talking about.

The problem that we face is when we start talking about access considerations is these doggone rigs that we have to use are, as you've all seen, I think, huge, and the support equipment is numerous. And getting that into a limited area and plus being so close to Explorer Road, which is busy all the time, could have a major impact to the Lab. We're trying to find locations that get us as remotely located from an impact to the general operations of the Lab as we possibly can.

But going that direction is something we can take a look at, Brian, certainly. That's not an unreasonable point.

SWARTHOUT: I think either location would be okay. I think it would be preferable to have it on the eastern side of that quadrangle.

BURIL: Sure. I can understand your reasoning.

NIOU: Is there any way that number 23 can be moved also east a little bit?

BURIL: No. That one, unfortunately, is not possible. What you're talking about there is, that's actually built on a slope as it is. Buildings 183, 301 and 158 are actually split-level

buildings, if you will. And they have a fairly steep slope there. The road that you see behind on the south side of 301, 158 and 183 is actually a very narrow road and is --

RANDOLPH: Only one vehicle, one car can barely get through there.

BURIL: That's right.

RANDOLPH: They don't even take buses or trucks. They're on separate roads.

BURIL: And that is generally blocked by various delivery vehicles and so forth, since we've got our main shop building at 170. We have things being delivered there on a regular basis. And then the road to the other side going toward 183, that's the only access road to that parking lot behind 183. So if we put anything there, we essentially shut down the ability to access those buildings. And that's just not acceptable.

Any other questions?

ROBLES: Comments?

BURIL: Comments, concerns?

SWARTHOUT: I think it's great that you're willing to put those wells in there. I really appreciate that. I think it will give us a lot of good information for designing of a treatment

system.

ROBLES: And we're happy to do that.

BURIL: Yes. Again, we'll talk about schedule, but we are planning to make that part of the RI investigation as opposed to anything else. So we are going to have a schedule impact. I'll discuss that down the road here and let you know what that's all about.

Any other questions?

3. OU-2 PRELIMINARY RESULTS

ROBLES: We'll move on to --

ROBLES: OU-2.

BURIL: Operable Unit 2.

Okay. You have here in front of you a summary of all of the soil gas results from the two sampling rounds that were part of the change in scope for Operable Unit 2. The numbers are interesting in so much as none of the numbers for a given location are sufficient enough to trigger what was identified in the work plan as the requirement for doing additional work. Certainly it's going to take some time, I think, for you folks to take a look at. And I think that it's certainly reasonable

for you to want to take a look at these numbers.

But, like I said, one thing I would want to point out is that none of the numbers, when summed across any given sample event or any given location, are sufficient enough to warrant the additional work that was identified in the work plan. At this present time we are not planning any additional work to further characterize the soil gas. We're actually in a position, I think, and I'll raise this as a point, kind of keep this in mind while you're reviewing this, is that these numbers are really small in almost all cases. There's only one that's got some carbon tetrachloride that has what could even be considered moderately interesting contaminant levels, in my opinion.

And the vast majority of the things are either non-detects or less than 10 ppb range. As such, it appears that the source issues as far as these locations go, looking for an active source, I don't believe that we've actually found anything that would indicate an active source of contamination.

When you look at the total contaminant concentrations at the individual locations you're

looking at something that is generally less than one part per million, in fact, in all locations less than one part per million and in many situations much, much less than that. As such, it becomes a question of just how much more work is going to be necessary when we're talking about a need for potential remediation. These numbers are vanishingly small and the ability to actually remove this level of contaminant to any great degree is questionable.

Of course, that's going to be something that we would address through the feasibility study, and of course that's part of what we plan to do through the feasibility study.

But just to place the thought in your mind, the feasibility of actually cleaning these tiny amounts of contaminants up appears at the least at the outset to be questionable. And as such, the need for any additional investigatory work on soil gas, in my opinion, is questionable.

You can study it to death, but if you're not going to be able to do anything about it, why continue to study.

BISHOP: 116, I assume that's the one you're talking about with the levels of carbon tet --

BURIL: That's correct.

BISHOP: -- that were of significant levels.

I'm trying to remember from the earlier work, was there other borings in that area from the previous rounds of both soil matrix and --

BURIL: Soil matrix work, yes, we did take soil samples at that location. I don't have the validated data available to share with you. But as memory serves, there were no numbers at that location in terms of the metals that were of concern, and semi-vols also I believe were not a concern. In fact, I don't think we found anything in terms of semi-vols. And the metals were all within what you would consider a background range. There was nothing severely elevated from any of the metals.

BISHOP: Was there any soil gas from the first round in that area?

BURIL: In the first round meaning?

MELCHIOR: Shallow ones?

BURIL: Oh, the shallow round?

BISHOP: Yes.

BURIL: I don't know. B.G., did we do that area?

RANDOLPH: Certainly. We did one at every

location. There was no detects at that time at that place.

BURIL: That's right. If that's what you're referring to, yes. That initial 9 is what I was thinking of.

RANDOLPH: No. I went around with the soil probes there.

BURIL: When we just went to the surface soil probes just to kind of check to see what we were dealing with, we didn't find anything there at all. In fact, that's borne out by the data that we show here. It's non-detect at the upper levels.

SWARTHOUT: Do you know at that location what the depth of the groundwater was?

RANDOLPH: It's probably close to 200 feet or better.

RANDOLPH: Jon, to answer your question, we were only able to get to the depth of 10 feet at that location previously and there was no detects at all.

BURIL: So again, it is a situation where you recognize you're going to need to take the data back and take a look at it, of course. But at the current time we are not planning any additional work on soil gas based on the criteria that we established in the work plan.

Continuing on OU-2, if there are no further questions or comments regarding the soil gas. Does anyone else have anything to add?

SWARTHOUT: What is the significance of this table, the rest of the tables?

RANDOLPH: Well, if you notice, the rest of the tables, just for convenience purposes, we've only got five constituents across the top.

SWARTHOUT: Right.

RANDOLPH: Look at the constituent list that's in that particular -- one sample in that particular point.

SWARTHOUT: So this is just laid out this way because there's more constituents.

RANDOLPH: That's right.

And then the sequence here, if you follow it through the numerical sequence you get to B 17, it says "See page" and I forgot to put in a 5. I'm sorry.

SWARTHOUT: Okay. That's fine.

BURIL: You say you forgot to put in 5 you mean --

RANDOLPH: Yes. It says "See page" and it should say "See page 5."

BURIL: Oh, "See page 5." Okay.

Any other questions regarding the soil gas data at this point? Okay.

4. ARROYO INVESTIGATION

BURIL: What I'd like to do, then, is to take a step back to our previous meeting and ask that Jon, Brian, Penny, you each recall that we'd had our discussions then regarding the arroyo and what may be a concern on the part of the agencies in regards to some past practices in the '40s and '50s time frame, and if you were able to come together with any ideas regarding what you would view as a reasonable scope of work for dealing with that issue that you've identified.

As I recall, we looked at it and we really couldn't put a bound on it very easily and we weren't sure what it was that you were actually trying to accomplish overall in terms of the overall scope of the project. And so we asked you to go back and kind of think about that and come back to us. Unfortunately, we didn't see anything in the letter that you sent us regarding that.

I was wondering if you had an opportunity to think about that and come up with any thoughts

about how you're thinking of approaching that.

NAKASHIMA: We didn't get together and talk about it.

BURIL: Okay. Any individual thoughts?

NAKASHIMA: Well, I think the main reason for investigating this is to show, if you want to show, that there's nothing there or to confirm that if you think there's nothing there, confirm that there is nothing there so that the public will feel at ease with this. Because there are the letters from the City and back and forth between the City and JPL stating that something was disposed of in the arroyo. So there are going to be questions that will be raised, whether it's concern from the public or the agencies.

And then just to confirm that, yes, there is something there; no, there is nothing there, then there should be some sort of --

BURIL: Some kind of an evaluation, you're thinking?

NAKASHIMA: Right.

I think a start would be just looking at the aerial photos, historical aerial photos. And then you can look at maybe points of discharge that you see from the photos from time to time and maybe

do a little bit of investigation in that area for -- I'm not sure what areas those will be since there's so much going on in the arroyo.

BURIL: That was the problem that we had, was trying to put a bound on this thing in some reasonable fashion that said if we look at that area the chances of JPL having contributed to whatever we might find there as opposed to other people how do we do that? How do we make that kind of determination?

In fact, we sat back, we thought about this. While I'm not sure that we've come up with anything that would actually say if we found something it would be JPL's problem, we've at least come up with some rationale on how to bound this and maybe how to go in and actually try to evaluate what's out there. And I'll take a couple minutes and share that with you and you can see the logic behind what we're thinking and then maybe have opportunity to comment on it. This is something that's reasonably new. That's why we haven't presented this to you before. We just came up with this, I guess, over the last couple weeks or so.

It's a purely conceptual issue at this point, although we have built it into our scheduling

considerations for OU-2 just to be able to try and have an idea of what we're talking about when we talk about wanting to expand the scope in that regard.

What we're thinking is, when you look at JPL and you look at the eastern portion of the Lab, which is really where we're focusing on, the arroyo area, it becomes a question of how did contaminants actually get there, and what was the mechanism. Well, the mechanism generally would be either through storm water runoff or a discharge on site that ended up in the storm water system and ultimately washed out into the arroyo in some fashion.

Now, trying to pick up something right at the discharges I think would be one way of looking at it, but it wouldn't really evaluate everything that might be there. It wouldn't give you a look how far did it wash out, how did it spread, and so forth. It would only give you one piece of information. So in trying to establish how we would best deal with the idea of one point is insufficient, but how many are, we thought that first we've got to put a bound on the system. We've got to understand where we want to look at.

What we thought was that if we look at the area from, say, the bridge, approximately, that's up there by MW-1, and we went down the western side of the arroyo. If you look at the area there, and in fact, it may be worthwhile to just take a walk out there at some point in time and look at the area itself, you'll see that it's actually essentially a fairly steep creek bed on either side. It doesn't extend all the way across the arroyo. You've got the spreading basins there, you've got the head works for the spreading basins, you got the parking lot. So the entire width of the arroyo shouldn't be an issue. It's the area where the materials could actually wash into and then in some way by the topography be contained in a given area and then seep underground or move or do whatever else.

So essentially we'd look at the eastern side of the creek, if you will, which would be more or less down the middle of the arroyo. It's difficult to show on this map. And unfortunately, we didn't bring the aerial photo so I can't really show you with that. But that's the bound of where we would expect materials to wash out. It's not going to go past that simply because it physically can't.

And up to the JPL property edge, which is essentially the other side of that creek bed. You go from the northern boundary of MW-1 down to about the equivalent of the southern property boundary, down here by MW-5 and MW-10, you see that east-west tracking portion of the property line, kind of a little tail down in the bottom of the map. Just draw a line across that and go across the arroyo. Call that our area, our bounds for making the evaluation.

We can then place a grid in that general area and place it on some centers. We had initially viewed, what was it, 200 feet?

ROBLES: 200 feet centers.

BURIL: And sample at that location or those locations that are in the creek bed when you develop the grid in that fashion. When we would sample, what we would hope to do is to look at soils that were deep enough that they wouldn't be impacted by erosion considerations on a regular basis. In other words, you don't want to look at the first couple of inches. But we also want to be shallow enough so that we would find the areas where we would expect to see a larger amount of contamination, simply because of the fact that you would be closer to the

point of deposition. And the thought process was, well, probably somewhere between three and five feet down is where we would look and pull a sample with the idea that you don't have enough erosion there to draw it away, and leaching and so forth wouldn't be sufficient enough to draw it down vertically, and yet you're close enough to the surface that if anything was there you should be able to detect it.

And we would sample at each of those grid points for the metals, which obviously the chromium being the concern, and the semi-vols due to what other considerations that we might have with the semi-volatiles.

The volatiles we would not analyze simply because, one, the sample method would drive them all off when you're in the Lab; and, secondly, anything that was volatile that was actually discharged into the arroyo probably, and in fact, I could say we could say assuredly, evaporated very rapidly from the point where it was discharged and really didn't have an opportunity to sink into the soils to any large degree.

That's the basic idea that we would sample at those locations for the metals, for the semi-vols, the things that don't volatilize easily

and disappear off into the air and are gone forever, and characterize what we have in the arroyo in that fashion.

That's our concept at this juncture. And we're thinking the kind of thing we would use probably would be a backhoe, B.G., to go out there and actually dig at these locations and get a sample here in the hole that we dig or actually maybe even out of the backhoe scoop, depending on what the conditions are like. Because we're actually talking about in some locations being right in the creek bed. And depending upon whether the creek is flowing or not at that given time will determine whether we can actually get a sample.

That's a lot to digest in one bite, I know. But any thoughts, comments, concerns about that kind of an approach?

BISHOP: You said on 200 foot centers. How many samples is that?

BURIL: Oh, geez.

RANDOLPH: We figured about 40.

BURIL: Somewhere in the 40s, yes. Up to 40 is basically what we were looking at. And that's a fair amount of sampling over that area. I think it would be sufficient to give us the characterization

do we have a major problem there or not, which is I think what we're really looking at. We're not trying to define in minute detail the constituents in the arroyo. I think we're just trying to determine whether we have a problem, a major problem that is heretofore undetermined. And if we identify it, then we would have to do some additional work potentially. We don't know. I mean, that's part of what we're doing here. It's a cold investigation without really knowing what we're expecting to find.

NAKASHIMA: Have you thought about doing maybe like a magnetometer survey in the arroyo? I know there were things that were buried in there and we're not sure what types of things.

BURIL: What would you hope to find in doing that?

NAKASHIMA: Well, I don't know what the documentation shows, if there's any types of drums or something out there that maybe JPL might have buried out in the arroyo.

BURIL: No, we hadn't considered anything like that, quite honestly.

None of the work that we've done, as far as historical work goes, indicated that we had any dealings with buried drums in that area. Most of

the stuff that we found really focused around the seepage pits, and the other areas that we identified as WP-1, 2 and 3 in the work plan, they were kind of bulldozed areas where we had a potential for things being dumped.

Also, in that general area one important point to remember is that whole area we're looking at has been City of Pasadena property since before JPL was even initiated. And as a result, what we find out there I can't guarantee you it would be JPL's concern. I can't guarantee you it would be anybody else's. But a magnetometer may show we've got a dump out there. But then whose is it is a question that would have to be resolved in some fashion because if you look at the -- remember the thing that Michelle gave us, the green-spined photographic surveys?

NAKASHIMA: Right.

BURIL: It showed that the JPL property actually started quite a bit further west than what's shown on the current map today. And it wasn't until the late '50s, early '60s that it actually moved out and is in pretty much the same configuration that you see now. All the rest of that was actually handled by the City of Pasadena. So a magnetometer may be a

thought. But again, it's one of these things that I'm not sure it's going to answer the question of did JPL cause a problem. I think that the soil sampling, you know, we're looking for constituents that would be specific to JPL, like things like mercury and so forth as far as metals go, that it might be a better indicator.

NAKASHIMA: Have you thought at all about maybe doing some type of soil vapor work out there? I know you have some of the wells that are down in the arroyo which have showed levels of ESCs above MCLs and that's why you put in the treatment system.

BURIL: That's a fair piece ago. First, we have not considered that. And the reason, again, being that for the volatile portion of the concern we have pretty well established, I think, that the points of entry into the soil were the seepage pits and so forth.

We've done some amount of work on the eastern edge of the property line.

B.G., how many of those points did we actually do in the general area of the eastern side of the Laboratory? I'm thinking like around 12 and up around 302 and those areas. Do you recall how many we actually did of the surface area?

RANDOLPH: About eight. Eight or nine. And that's just a little bit of a stretch there.

BURIL: So we've already done some work in that general area. And that would be where I would expect to find a greater potential for finding the volatile concerns. That's actually on JPL property. And as I recall, we didn't find anything.

RANDOLPH: No.

BURIL: So from that standpoint, it doesn't appear that -- the older parts of the Lab, which would have been the ones that would have been dumping materials in the pits, like around Building 302 there on the map, that if we had a problem there, we probably would have seen something come up from those vapor analyses and we probably should have seen something appear in the vapor analyses that we did for individual well locations that we installed. As memory serves, we saw nothing when we did that. So I think as far as the vapor concern goes, near-surface vapor concern, I don't think you're in a position of saying that we've got a concern of near-surface vapor contamination.

I think what we're actually seeing in the groundwater wells is a transport of the contaminant via the groundwater pathway to those locations as

opposed to something that's coming from above in some vapor or other state and getting into the groundwater.

NAKASHIMA: That's if your points were on site. But if they happen to be something being disposed of in the arroyo maybe --

BURIL: Once again, it's the same thing that I indicated before, that JPL did not have control of that property and didn't use that property.

NAKASHIMA: No, no. But they may have had discharge points into the arroyo, like the incident of the cooling tower waste water with the chrome in it and the water that had the, in that case, TCE.

BURIL: Once again, I feel fairly confident when I say that in the incident of the volatiles, if there were any volatiles at all disposed of in the arroyo, that the potential of them having actually gotten into the soils and stayed there is extremely low. And I think that's borne out in large part by when you look at the water analyses from the groundwater wells. I would expect to see higher concentrations if we had that kind of concern. In fact, we're not seeing that at all. We're actually seeing the similar kinds of concentrations in gradient of concentrations from the area that we

know to be contaminated out to the edge.

If you look at the data that we have now and look at Wells 1, 15, 9, 12, 3, 4 and 5, the numbers are on the 1s, 2s kind of range. We aren't in the 10s, 20s, 50s kind of range at all.

NAKASHIMA: I think that's been one of the problems, is we haven't had all the data to look at, either.

BURIL: Sure. I understand that. That's one of the reasons why we're giving you anything that you can have, everything that we've got, basically, that's been validated up to now.

But again, I think from the last meeting when we had discussed this we had pretty well shown that the eastern and western portions of the Lab were essentially clean as far as the groundwater considerations go. And there's still a question about the southerly part of the Lab at MW-10 and we're looking at that through the addition of the three wells.

As far as any volatiles in the arroyo, I have my severe doubts that we would find anything at all. Just based on the dynamics of that feature and the known discharges as far as the chromium in the cooling tower and so forth, I don't think that we're

going to have much of a chance of really locating anything. I think we would go out and look and we would only verify what we could intuitively deduce right now and that is that you're not going to find anything.

NAKASHIMA: I guess another thing may be, what, stream sediment sampling in the arroyo area where everything has washed down.

BURIL: Where are you thinking of?

ROBLES: Right behind the dam?

NAKASHIMA: Well, I guess along the pathway of where it washes down.

BURIL: That would be part of what we would do by having the grid. Whatever point in the grid landed in that area, we would sample it. That's the best way we can do it. Because the configuration of the stream today is vastly different than it was even a year ago.

NAKASHIMA: I'm just tossing out ideas, if I may, to use for investigating this area.

BURIL: Sure. I understand.

Perhaps the thing to do on this, then, is to -- we've laid the concept out. I haven't heard an opinion that it's the wrong approach. You had some suggestions of possible additions. But

overall, do you think that the approach in concept is at least sound, or what's your thought on that?

NAKASHIMA: Well, I think that it's a start.

ROBLES: What are you looking for?

NAKASHIMA: Well, actually, what I'd like to see is I'd like to see it written down exactly what you plan to do and what kind of sampling you plan to do, and the locations.

BURIL: Okay.

MELCHIOR: Would you like that in the form of a letter or an addendum to a work plan, or in what form?

NAKASHIMA: Either way.

ROBLES: The question needs to be asked: What for? What are you looking for, Penny?

NAKASHIMA: Determining whether or not there is any impact to the arroyo from the operations at JPL.

ROBLES: And saying that, if we find something, can we make that determination? Can we make that determination if we don't find something?

Can we make that determination, Chuck?

BURIL: I don't know. That's part of my dilemma in looking at this. We could find something --

MELCHIOR: It's an open system out there.

ROBLES: It wouldn't prove anything.

BURIL: Whether it's ours or somebody else's is going to be a point of conjecture.

SWARTHOUT: Do you own that -- you don't own the arroyo?

BURIL: No, sir. We do not. We have never owned it.

BISHOP: As you said earlier, though, if you found some levels of chromium or mercury or things that you wouldn't expect from maybe normal household dumping, which is what essentially the other possibility in the arroyo is, is people that drive in there and dump something, there is a higher likelihood that we would feel that had something to do with JPL. If you found motor oil, we'd probably say, you know, that's really --

BURIL: Who knows who it belongs to. Okay. That's a reasonable point, I think. Peter, I think you'd agree with that.

ROBLES: That's all I'm asking, because I don't want to go on a fishing expedition. My contention is it doesn't matter what we find in there. It's not our property. It's open season down there. We're doing it because we want to be nice guys. It really still bothers me, because that's not our property. It's open season. It belongs to

Pasadena, and a lot of people have dumped stuff up there. They could have dumped chrome parts, for all I know. So the question is: Are you looking for the deepest pockets to tag this problem on? Because that's not our intent.

What we'll do is we'll give you what we plan on doing. But we want a response back on what you want to look for. What is your game plan? We're not going to start this until I know exactly what you guys want out of that study and what we're going to come out with. I don't want to be studying everything in there forever just to find something so that we can get blamed for it. That's all I'm saying.

BURIL: So to take that one step further, then, I guess what you would be looking at is the agencies' criteria for establishing responsibility and --

ROBLES: If anything is found.

BURIL: -- what kind of additional work they would be expecting --

ROBLES: What do you expect us to do if we find something? Step one, we go find nothing. Okay. What does that mean to you? Step two, we go find something. What does that mean to you? Step three,

we find drums down there. What are they going to require of us?

Because this has to be brought up to our HQ as well. Technically we don't have to touch the Arroyo Seco. Our FFA agreement does not require us to touch the Arroyo Seco. We want to --

NAKASHIMA: I'm not sure that that's true either, because the investigation would include not only the site but any impacts on the site operations even off site. So if it were off site, what you can trace back to JPL, then you would be responsible for it.

BURIL: I don't think there's any question about that.

ROBLES: But our OU-3 is indicating there's no problem, then I don't see why the Arroyo Seco investigation.

BURIL: I guess that's one of the questions, Penny, we would have to try and answer. Using Jon's example, let's say we go out there and we find TPH. That stuff tends to be ubiquitous across an awful lot of areas that have had any kind of human activity with them. We already know there were some City of Pasadena-operated sites there in the arroyo. What kind of a relationship would be required

between JPL's responsibility and the City of Pasadena's responsibility if we found that kind of contamination? Because I don't think that you could reasonably say it's definitely JPL's and I don't think that we would readily admit that it is all our problem if we find something that is readily identifiable as a strong probability of being somebody else's.

Mercury, well, that's another question. I mean, that would be one that we would have to take a harder look at and try to determine what to do. Chromium may be another question still.

But depending upon the nature of the contaminants, there could be very strong and reasonable questions about who is actually responsible for dealing with it.

Let us do this. Why don't we put it down on paper for them. We can outline it in as much detail as we can to be sure that you understand what our thought processes and train of logic are and you know everything that we're thinking of doing, and give you opportunity to comment on that. Then in the same fashion we would hope that when you do comment on that you would be able to respond to us as far as what kinds of triggers, I guess, you would

be looking at to say that "JPL, you have a problem here, in our opinion, and therefore we think you need to do more work." And what that might be I don't know. But that would be something that I think you would have to try and come to agreement on as the regulatory bodies and let us know what that would be so that we can factor that into our planning as well.

Again, this is all premised on the idea that we never controlled that property that's out there that we'd be looking at right now and, in fact, it was controlled by others. We can look back in the historical records and see dumps that were out there that were controlled by others. It's a question of if we find something that is a concern to you, who ultimately is going to be held responsible?

It's a tough one to chew on, I know. But it's something I think a government agency definitely is going to have to take into account.

ROBLES: Technically it doesn't fall within our FFA.

BISHOP: Right. But, I mean, I think your approach is reasonable. But on the other hand, you know, there are records that Penny has that show

that things have been discharged from JPL here in the arroyo.

BURIL: Sure. Again --

BISHOP: So just saying that everything out there is controlled by others, yes, there are parts that are controlled by others, but there are parts that you've had, as JPL, direct influence on.

BURIL: That's true. That is true. That's part of the reason for us going out there and trying to be reasonable and saying, yes, we know we had something go out there so we're going to look." But if we find something that's questionable in terms of who is responsible, it's a question of well, now what do we do.

BISHOP: And I think that's reasonable.

BURIL: Any other comments, questions on that aspect of OU-2?

A lot of blank looks over there. I think we'll go on.

Brian is sitting there going, oh, boy, I'm glad I'm getting out of this.

Okay. Where are we?

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5. OU-3 PROGRESS

ROBLES: OU-3.

BURIL: OU-3 progress. Where we stand right now. I already gave you a real brief thumbnail of where we're at. Some of the stuff that we've had to encounter through the OU-3 construction have been kind of interesting. Let me just go through the wells one by one, starting at Well 17. Currently that is in development.

We hit bedrock on that one, Vince? Or didn't we? I don't recall.

RICHARDS: About 825 feet we did.

BURIL: So it's been cased and the screens installed in the areas where we felt were the most likely locations of the highest permeability and best conduit for contamination. Five screens in that one. We have the overall well development going on now. We hope to be installing the west bay systems in, what, about two weeks?

RICHARDS: No. About 10 days, 7 days. 8 days.

BURIL: Only a week.

RICHARDS: Yes. That's based on --

BURIL: Making the assumption that everything goes as we hope it will.

RICHARDS: Right.

BURIL: We'll have another two weeks of west bay development, approximately?

RICHARDS: Approximately. Once we put the west bay -- west bay takes about three days total to install. And then we start going in with --

BURIL: With the individual screens.

RICHARDS: Right. Based on so far, it's been going about one screen a day and a half per screen.

BURIL: So overall, about two weeks until west bay is in and hopefully developed?

RICHARDS: Right.

BURIL: That's once we're done with the initial development.

And so that's looking okay. I'm really happy to report that we have had not even one what I would call strong complaint about the work that's going on in the community. We've apparently satisfied the community concerns in large part through our fact sheets and through our individual letters to the immediate surrounding neighbors.

I have to compliment Vince and his crew, that they've also talked to people a lot and given them a lot of information about what's going on and how things are going and what the schedule looks like, and so forth.

There's only been one lady who was concerned at about Easter time that she had people coming in from out of town and these big nasty sound curtains are going to be up there making her neighborhood look ugly. We explained why that was necessary and she was happy with that. That's really been, as far as I can recall, the extent of any concern that's been voiced by the surrounding community.

SWARTHOUT: I think that's great and I think it's very commendable for you guys that you guys did such a good job with the community relations prior to going out and doing anything.

BURIL: Thank you. We have a lady in our Public Affairs Department who is very, very sensitive to that kind of thing. She knows the kind of things to do. It's worked out very well for us so far.

SWARTHOUT: It's the kind of thing you don't realize how much trouble it can be until something really goes wrong.

BURIL: That's true. So that's Well 17.

Well 18, that was the last one we drilled, and it is cased and is currently undergoing the general well development. West bay is scheduled for, what, about a week or so after 17, Vince?

RICHARDS: Actually, because of the way the schedule is set up, it's MW-17 and 18 almost right on.

BURIL: Simultaneous. Okay.

RICHARDS: Scheduled together. Development schedules and just --

BURIL: All right. So we're hoping to be complete on that one at the same time as MW-17.

MW-20, which is out in the church parking lot, has the west bay installed. In fact, I think that was completed yesterday, wasn't it?

RICHARDS: They're inflating packers today.

BURIL: So it's being completed today. The development will begin on that probably tomorrow or Monday, depending upon how things go with getting the rest set up.

So we're probably looking about two weeks or so, approximately, depending on how development goes, to have that one ready for sampling.

Then lastly, 19 and 21 are complete. They're ready to go.

So we're hoping that by month's end or slightly into June we'll actually be in a position to go out and do the sampling for OU-3, the first round.

Of course, based on the conversation we had at the last meeting we're planning a second round of sampling one a quarter into the future from that point in time, and then using those two sets of data as the basis for the feasibility study, and so on.

SWARTHOUT: Great.

BURIL: Questions? Comments? Concerns?

BISHOP: It didn't sound like you're having any major trouble with your drilling rigs.

BURIL: We ran into some delays, but they weren't something we couldn't overcome fairly readily.

We're very fortunate that Vince has kept those guys going. Lang Drilling, just as an aside, if you get anyone asking you and you can actually say something off the record to someone, Lang Drilling is a very good company, in my opinion. They've done a very good job for us.

BISHOP: Good.

BURIL: That's basically where we're at with OU-3. I don't have much more to report on that one.

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6. PROJECT SCHEDULE

BURIL: So I guess we're down to number 6 on the schedule.

SWARTHOUT: Are we going to talk about the schedule for OU-3 again?

BURIL: OU-1, 2 and 3. And I'm going to incorporate all the different facets here now. These schedules are preliminary at best. I'm only going to hit the highlights in terms of reports being completed and so forth. I'll build in a couple of the assumptions that go with these things so that you're aware of that and you can understand why some of these are where they're at.

I'm going to start with OU-1 because that one has at the outset the greatest degree of change that's been agreed to thus far.

We're looking at being able to actually begin work on that in fairly short order. Now, of course, we have a consideration here of having to go through the process of review and approval of all of these things. We're not sure how long that's going to take. A question that came to mind is, what means do we use to formalize the change in scope? Is it something that we do as an addenda? Do we modify the existing work plans and FSAPs? Do we do

it as some other mechanism? What mechanism do we do it in? In fact, we have been looking at this as, because of the nature of the change and the extent of the change, that we would actually be in a position of needing to modify the existing plans and have that go through the review process.

I don't have the overall schedule in front of me, unfortunately, but that was viewed as a fairly short process in relative terms of what we've gone through already.

The installation of the wells is something that would naturally take a bit of time, since we're talking about multiport wells and fairly deep holes and conditions that are generally not very conducive to poking holes in the ground. And then doing what we -- I'm trying to recall.

Are we talking about only one round of analysis again, Mark --

CUTLER: That was the plan.

BURIL: -- for these three wells?

CUTLER: It would be a limited sampling. We're trying to find the edge of the VOC plume and maybe some metals. So after the three wells were installed, all the wells would be sampled with this limited analytical.

BURIL: Then going through the data validation. Essentially, the whole process. We're essentially starting -- I won't say starting over, but in large part we're repeating the same phases of work that we've already completed to come up with the data that we could use in the feasibility study and remedial design.

Cutting to the chase, we're really looking at January of 1997 before the RI report would be complete. We're looking at the FS coming within a month after that.

Again, if you think about the length of time it took us to do operably one well through all of the data validation -- and procurement itself is actually a nightmare for us. The procurement cycle is generally a minimum of four months long. And that's mandated to us by the FAR. You're probably painfully familiar with that one. So that's the longest schedule impact. Again, I think if you look at the idea that we're talking about, essentially a 60 percent increase in scope, that the time frame is one that is understandable, at least in my opinion.

On Operable Unit 2 --

SWARTHOUT: Can we just discuss that?

BURIL: Sure.

SWARTHOUT: My schedule currently has the RI being submitted supposedly at the end of this month?

BURIL: Yes. It's not going to happen.

SWARTHOUT: Right. So the change in the scope of work is the three additional --

BURIL: The three additional wells with all the modifications to the work plans and the procurements for all the additional work.

The modification of the contracts is something -- I have to modify my contract with Foster Wheeler. They have to go to bid on all the drilling and the Laboratory work again. We have to go through all that review and then the actual installation of the wells, and so on. All that just takes a lot of time.

SWARTHOUT: To me it doesn't seem like we need to have that additional information to submit the RI, though. To me it seems like based on the current information that we have we would have enough information to begin the RI and the FS.

ROBLES: And then bring that down later on the ROD.

SWARTHOUT: Yes.

ROBLES: We're totally against that, because that is one way when the document goes out for

public comment that they can cite that it was not done properly procedurally. Every data that you get out there must go into the RI/FS process first. We can't wait until a record of decision to bring something in.

SWARTHOUT: Well, I would, in a sense, disagree. Because you're also going to be collecting data and you're never going to be able to say, okay, now -- you know, I mean, hopefully eventually you're going to stop installing wells and you'll have the majority of the investigations done. But I think you'll always be collecting data in the sense that you'll always be collecting groundwater data. Maybe you will put in an additional well or two occasionally.

ROBLES: When you put those wells in after, it is for monitoring purposes, not for designing FS purposes for characterization. And there's the difference. When you send these documents out for public comments, if they catch that, that is a procedural violation that they can hold up the whole thing on.

SWARTHOUT: I don't think so. I don't think there are any procedural violations like that. I think it's up to us to decide when we have enough

data to design the system. That's the point of the RI, is, you know, to be able to have enough data to decide, okay, what we're going to do.

BURIL: Taking it from that standpoint, just looking at what we're trying to do with the additional three wells, we're trying to establish the bounds of the contaminant plume to a higher degree so we can understand how best to treat it. In doing that, we're talking about reducing the area, possibly very significantly, that we would have to deal with in a remedial design.

SWARTHOUT: Right.

BURIL: And in dealing with that, the feasibility of certain aspects of remedial action could be severely impacted. In other words, if I have to go out here and install a pumping system that pumps 5,000 gallons a minute to have a zone of influence large enough to deal with the area that we currently understand, the feasibility of that is quite a bit different than a system that we may identify as a result of bringing in this new characterization information and find out that we're only pumping 500 or 1,000 gallons a minute.

SWARTHOUT: Well, I can't imagine why you're asking for over a year and a half to install three

wells and to submit the RI. That seems like a very long time to me.

ROBLES: It's the procedures, the process of modifying.

SWARTHOUT: You can send me a letter tomorrow outlining what you'll do for the three wells, I'll approve it in the next three days and that's your work plan addendum.

BURIL: Okay. We can look at that as shortening it from that standpoint.

SWARTHOUT: I'd like to see, you know, a timeline of what the year and a half is because that sounds like a really long time to me.

BURIL: I guess that's not really an unreasonable request.

SWARTHOUT: As far as on my side, I think on the regulatory side, I think that we can cut a lot of corners as far as, you know, we don't need 30 days to approve the work plan.

BURIL: I can't recall exactly how much of that is all built in. But I don't see that as being unreasonable to know where we're coming from and then we can talk about that aspect.

ROBLES: The person that comes after you, will they understand that?

SWARTHOUT: Sure they will.

BISHOP: I think that I agree with Brian. The biggest issue is the first round of setting up the work plan and everything. So essentially saying you're going to do it the same way that we've already approved in the past ones, that doesn't mean we have to go through that whole process again.

BURIL: That's a fair point. That's something we can put in front of you so we can understand where we're coming from.

The thing that really slows us down, quite honestly, is, one, the length of time it takes to actually drill the wells. We're not talking about bringing two rigs on site at this point in time, that I can recall, on our schedule.

Is that right, Mark?

CUTLER: No.

ROBLES: It's one.

BURIL: So we're talking about one at a time to get those in. Those are typically a six- to eight-week procedure to get those in place and cased and developed, and so forth, to the point of where they're ready to sample. So you're talking almost six months right there. The procurement process itself is lengthy simply because we're a

quasi-federal agency and we are stuck with the procurement process that we have. We have no way to get around it.

BISHOP: There is another option that we proposed in one of the sites in San Gabriel, which may or may not be appropriate here, was to say that this is the extent of our Phase I RI. This is what we're doing. And the result of the RI is that we need to refine the information in this area. So that means that we don't hold up all the other work that's been done in compiling the RI because we need to do work in another portion, a sub area. The result of OU-1's RI is that we need to refine the data in this area. We have a data gap and this is what it needs to be. And that is essentially the result and it triggers doing a specific RI for that, or Phase II.

That's one approach that we used for El Monte in there, is say we don't want to make this open ended forever, but we don't know what we're going to find.

MELCHIOR: The biggest concern I have is that the areas you're asking for characterization are in the middle of the area of most concern. I can understand that approach if we had a small pocket

somewhere else on site that wasn't influencing this.

BISHOP: Maybe I've got -- but the way I envision this is that you're planning to do the RI so you can set up the FS, essentially.

BURIL: Right.

BISHOP: There are a lot of portions that you already know that you could work towards the FS.

BURIL: In fact, we've already completed a lot of the RI preliminary sections. I mean, it's getting all of the data that need to be factored into the risk assessment and understand all the implications of that to be able to draw that into the FS and then be able to come up with a remedial action that is suitable for the site. That's all we're really trying to identify, is how we can best accomplish that.

Brian's indication that you can cut down your own review times to try and assist that schedule is great. I think that's a wonderful idea. Whatever we can work together on to achieve that end is reasonable.

Recognize, though, that we are in a position of saying that the procurement process -- I go to procurement because that's been a nightmare for me over and over again. I'm used to industry.

You know, I put my name on the line and it's done and I've got a contract.

Here getting on contract is a four- to six-month process. It's just the way that we have to work as a contractor for NASA and NASA being constrained by the FAR, and they even have special provisions within the FAR that say how they have to work things. You know what I mean by FAR, the federal acquisition regulation.

BISHOP: Oh, yes.

BURIL: You're familiar. I don't know if everyone is. And those are just nightmares to me. I have no way of getting out of that. We'd be in violation of our prime contract if we tried. So I'm told flat out that's not going to happen.

You take that into account and then you're talking about six months to actually install the wells and then to get the samples and data validation and incorporate the data. All of that takes, it seems like, an inordinate amount of time.

I have to agree with you, Brian. When I first saw this I about swallowed my tongue. I couldn't believe it. I went through the whole thing and piece by piece of all the different steps, it added up. And I was looking back at what it took to

do the initial work when we originally said what it is we want to do.

And even factoring out the time delays that we had as a result of procurements and a variety of other problems that we ran into, it was still in the neighborhood of 18 to 24 months to get the initial work done on OU-1. So this was on the short side of that issue. And if we can shorten this still by working through the review cycles and so forth, I think that's great and we should try to do that.

But I wouldn't expect that we'd be able to shorten this down to, say, six or eight months. I just don't see that as being possible. Just the construction alone is going to be longer than that. And then getting all the rest of the stuff together as far as the data and then incorporating that in the reports and so forth is less of a time than what you would expect because we've already gone through it, but it still takes time. But I think it's reasonable to at least put it in front of you and give you an opportunity to see what we're talking about.

SWARTHOUT: I mean, I just think that the approach that Jon was talking about, and I think

your concerns are a little overstated in that. You know, I think at this point we have enough data now to write the RI and we can do the additional work that we need to do as part of the remedial design and the remedial investigation.

ROBLES: Now, think of me as a guy out there and you just made that statement. We have enough data to do the RI. Then why are you putting three more wells in?

SWARTHOUT: Because there are a few areas where we are not exactly certain of the extent of the contamination. But at this point we feel we have done enough work to determine the primary extent, nature and extent of the contamination and the additional work will only be used to refine the work that we've currently done or the information that we currently have.

BURIL: But yet when you look --

SWARTHOUT: You can't tell me at this current point you can't write an RI and an FS.

ROBLES: We could do that right now. And the question has always been: Why the three other wells? And what is that going to do for you to enhance significantly your original RI that you were going to do without it?

SWARTHOUT: It's going to ensure that you know that you don't have further contamination out in those areas.

MELCHIOR: That's going to be a big issue for the alternatives analysis, A, if a system, a remedial system is needed is a question, and, B, the scope and the type of system that's required. So I think you've got two very sizable questions.

ROBLES: They are going to need to be addressed. I agree with those three wells. If there is more contamination going south of us, we have it all localized. That's one way of designing. If those wells show something that's going off site, we've got to do something else. We cannot just contain. So to me those three wells are significant enough. And to do an RI and say, well, we'll do a generic one leaving a lot of blank space and wait for the answer to come back, I don't know -- that doesn't sound kosher to me.

BURIL: Let me ask you this, Brian. The one concern I have, of course, in trying to reach -- I think what all our goals are is get to a remedial action. I guess the question I have is a concern regarding the timing of these things, not how long it's going to take. Is the concern more one of

getting to a remedial design that we can support, or is it one of checking a box saying we completed this portion of the process?

SWARTHOUT: For me, the point is moving ahead when I feel like we have enough data to move ahead at this time and not to stop everything just for the installation of those three additional wells. I haven't committed to a ROD yet at work. I mean, I can -- as long as it's not -- it wasn't due this fiscal year. I can push it off as far as I want. But I just feel that at this point there's no reason to stop the work to wait for these additional -- you know, a lot of what we talk about at federal facilities, and I realize this is kind of a quasi-federal facility, you know, with DOD it's all this fast track, do things, don't wait, you know, no investigations, move to a remedial design.

So that's the thing we've been pushing, is trying to find ways to move ahead with the project and not wait for the additional information that we need and hold everything up.

ROBLES: But that process that you're talking about with DOD is based on risk, health risk. Okay? It's not just based on contaminated levels. What is the health risk? You go from high to lows. You

don't go from what is geologically sound. So you say if Site 1 is worse than Site 10 then we go to Site 1?

SWARTHOUT: No. I'm not actually talking about the DOD risk model. I'm talking about the gross way that we look at things at EPA, and the way we've been trying to move in conjunction with working with DOD is, you know, not to wait.

BURIL: I understand where you're coming from, Brian. But one of the things that strikes me is that whether we put the wells in now or put them in later, we have to have that information to get to that juncture, to get to that RD.

I can't in good conscience sit here and say I can tell you what the design of the system is going to be without having the three wells in place. Whether it comes to the point of the RI or comes after some interim RI and then finally we get a secondary RI and RD, I don't think it makes any difference, because you're going to have to have that information regardless in order to come to the point that you're talking about.

NIOU: But your RD doesn't have to come out until after the ROD. Brian is saying right now he's not ready to sign the ROD, but you do have

information for your current RI. Not only that, also if those two, 22 and 23 found something, your alternatives may not be changed but it's just the size of your system or your slight modification instead of the whole alternative will be changed so much impact. Because you have 14 and 10 already tell you something at the two end there. These two will refine your conditions instead of change your alternative 180 degrees.

So that right now you can carry on. Later you attach your addendum into the thing and before you sign your ROD we already can put everything together and know. And our RD/RA will come in after the ROD.

MELCHIOR: I'm not sure you want to get yourself locked into an alternative without all the data at this stage of the game. I think we've seen that too often. We're a clean-up contractor. We've seen too many RODs go too fast and then have to change the ROD because of trying to rush the process. And actually you delay the remedial action.

SWARTHOUT: I think that in this instance, as Steven was saying, it's not like we're going to switch from -- you know, switch the treatment alternative.

MELCHIOR: Oh, very well. It could change things completely.

NIOU: Please give me example. Because you already have 10 and 14 define what's down there. Just by those two. Give me example.

MELCHIOR: My contention, if you're comfortable with the level of characterization, it's questionable whether we need additional wells.

BURIL: Why are we talking about three more wells?

ROBLES: Why are we talking about three more wells? See, why do we need three more wells if we can do characterization right now? Why don't we just go with what we've got? We have enough information to go and make an RI/FS. I think it's a record of decision. Why do we need three more wells?

NIOU: Because like we talk when Brian mentioned that, right now, with 13 and 16, 16 found contamination, how do you define your 5 ppb line or 50, whatever? With those 20 and 23 you have much better knowledge of putting that line. But that won't change your whole alternative. In fact, just say, well, you only need to remediate to this line instead of that line.

SWARTHOUT: Exactly.

ROBLES: I still got a hard problem with that.

BURIL: I do too. Only from the standpoint what you're talking about, Steven, I can understand on a conceptual idea what you're talking about. From a practical application and from the point of view from individuals looking in on what we're doing, we're going to a feasibility study without having completed enough characterization to know what we're doing. I mean, you're putting those wells in to characterize the plume. You're not putting it in to deal with any kind of a design issue per se. You're still at a point of characterizing what it is you're trying to remediate.

MELCHIOR: One of your concerns is you don't have a vertical depth in the center of the quadrilateral. One can speculate what the vertical depth might be. But what seems to be a concern of the agencies is that that vertical depth is undefined. If that's your premise, then, and you believe that is true, then that data must be collected as part of the RI.

SWARTHOUT: What do you think -- I mean, I don't want to put you on the spot, but what do you think the treatment alternative is going to be?

MELCHIOR: I've had a contention for many years of what it should be, but I won't state it here.

SWARTHOUT: Provided that we're going to put a groundwater treatment alternative in --

MELCHIOR: That's a question. That's a good question.

SWARTHOUT: That's why I said "provided."

MELCHIOR: Bifurcation here yet.

SWARTHOUT: Provided we're going to put a groundwater treatment system in, you're probably going to be pumping groundwater from the subsurface and treating it on the surface. I don't see how --

MELCHIOR: We might be able to sparge it, which is a completely different alternative.

SWARTHOUT: If you're going to sparge the groundwater or treat the groundwater in situ, I don't see how -- wait. Let me just finish. -- I don't see how, you know, things would change significantly where you would actually change the treatment alternative.

MELCHIOR: Yes, well, you've already stated that there's two selections here. You've mentioned an extraction, a physical extraction of water and then a surface treatment. I have mentioned a completely different alternative, which might be a very

feasible alternative if the definition of the contamination is very confined.

BURIL: As well as not very deep.

MELCHIOR: As well as not very deep. So those are two different alternatives. The cost magnitude is probably two orders of magnitude difference.

BURIL: Regardless of the cost issue, you're still at a point --

MELCHIOR: Absolutely. A sparging system would be in and out in several years. Pump-and-treat system, 20 years minimum.

BURIL: Regardless of the cost at issue, I don't want to make cost the issue in this thing, what you're talking about here is the inability to determine whether or not a sparging or a groundwater extraction is the most viable alternative because you don't have enough of the characterization completed to make that determination. You don't know if you can sparge because you don't know how deep the stuff is in the middle of the quadrilateral. That's one of the reasons we're agreeing to put that well in. We see that as a data gap, but it's critical to understand whether alternatives can be reasonably put aside or kept in the loop and evaluated. That's the crux of the

thing that I come down to, is that you need to have enough of the characterization in place to understand what you're dealing with.

And you say we're trying to refine what it is. I'll draw a little picture here just to kind of give you the idea. I think this is what we're really dealing with.

Here is the area of our contamination, let's say. Here is the area we have defined. My remedial alternatives are going to be quite a bit different if I go in this potentially than if I'm just going to look at that, both in size, magnitude, applicability.

SWARTHOUT: I don't agree with you. Give me the pen. I mean, let's draw it on the map. Currently we have our contamination like this. You know, I think currently we have our contamination something like this or maybe even up here. I don't remember what 4 was. All we're trying to figure out is where to draw this line. I mean, it's not like it's like this or this. We know we have significant contamination here, you know, up to --

BURIL: Take a look at the scale of the map that you're drawing on here, Brian. What you've just identified there from the bottom of your line up

that quadrilateral is a distance of nearly 1,000 feet.

SWARTHOUT: Well, I don't think we're arguing about this area. I'm talking about this line here.

BURIL: I'm talking about to the south and to the west. You're talking about distances of well over 1,000 feet. And the ability to understand what you should do when you're talking about distances that are approaching a quarter mile makes a fairly significant impact on what is feasible and what may not be feasible.

SWARTHOUT: I just don't see the size of the five part per billion plume changing that much, because what we're trying to do is fill in where to draw the line on this site.

It's not an issue of this or this. It's more an issue of, you know, this or this or this. And I don't see that being that significantly different.

I don't know, Dan. What do you think?

MELCHIOR: I think we could really be close to finishing off all the data. We ought to get it and then write the feasibility study with a full and open mind.

BURIL: I agree.

MELCHIOR: As a complete picture as opposed to having -- I personally agree with you. The whole issue, the schedule issue is one that confounds us all. But we're stuck with the situation with the depth to groundwater, what it is and the depths of these wells. But I guess I'd like to have that data.

SWARTHOUT: It's always the case -- I mean, this is kind of a cliche' in this industry is, we'd always like to have more data.

MELCHIOR: I think your one well -- I've been an advocate against the two western wells, kind of going along with your premise that we could go to a feasibility study without those two western wells. Your central well may be a -- the vertical contamination is a very valid one. I think that's one that -- you can debate all the merits of whether you need three wells or two wells or one well or -- but I guess your points are valid. Our concern is just the timing of this, putting it in the remedial investigation as opposed to a later date.

BURIL: Again, I think it's one of the things, too, Brian. In looking at this, and I'll place myself in the role of Joe Q. Public for a moment. They don't understand the process of getting to a

remedial design versus an RI versus construction. All they're going to see is that we finished something, we knew what the problem was and we built something to fix it. And how fast we get to that "built something to fix it" is really what they're going to be looking at.

Now, if we all agree, and I think we are in agreement, that these wells are necessary in order to get to that "built something to fix it" point --

MELCHIOR: Correctly.

BURIL: -- correctly, that the public, and I think that our own goal should be that whatever process in timing we follow within this is going to have to stand up to scrutiny. And when you go in to deal with this, if you're talking about putting the wells in an RI phase or an RD phase or whatever, the impact to the overall "get it built to fix it" is the same.

MELCHIOR: Right.

BURIL: And you're going to end up impacting that issue, which is the most critical one, I believe, for the public to see regardless. So where it comes within that process becomes an issue of internal concerns with the regulatory agencies and

the ones for NASA and so forth. It's not something the public is going to have any vision into and they aren't going to care.

ROBLES: I don't want to be responsible for building a remediation and then later on when the three wells that are -- comes back to us --

SWARTHOUT: I'm not asking you to rebuild the remediation. I'm asking you to submit the RI. I agree we need these wells to build the system, but I don't agree we need them to submit the RI.

BURIL: Again I go to the same point, that if we put the three wells in, and I think we're all in agreement that they need to go, if we put them in the RI or we put them in an RD, the end result to the overall project is the same. The delays --

BISHOP: Well, no, I think this is where there may be -- what I'm saying is that the RI is a major work step which is going to take a major amount of review. If that's going on at the same time that the construction is going on of these wells, then, that may be able to speed things up. I'm not sure that I can quite -- because I don't really understand the whole Superfund process of where things need to fit in. It means to me that we've done two years' worth of work that ought to be able

to be put together in a report and start the review process to make sure that the conclusions that are coming out of it make sense and that we're all in agreement.

BURIL: Absolutely.

BISHOP: But what it sounds to me like you're saying is we have to wait until January of '97 to see that.

MELCHIOR: No. You're seeing this data right now. You have the packages of data. You have all the -- we'll be glad to provide you all of the geological information. I assume I can say that.

BURIL: Oh, yes. No doubt.

MELCHIOR: And the boring logs.

BURIL: That look was one of approval, Dan, not "Look out."

MELCHIOR: You see where we're heading in terms of the level of characterization. So you are in the review process now. And, in fact, your coming to us requesting three additional wells is an indication of a level of uncomfort that you have, being an educated member of the regulatory community as opposed to, let's say, a non-educated concerned citizen who might not quite recognize why you wouldn't fulfill the need that you requested at the

time of the RI as opposed to a later time.

So I guess what I'm saying is you raised a concern. John Q. Public will raise the same concern and it's irrelevant to them when those questions are answered.

SWARTHOUT: I mean, when you were asking about, you know, checking off a box, I mean, part of my concern as a regulator is that we need to get the RI in and get it submitted, because it is part of the Superfund process. I don't want to push it ahead of time and make it not worthwhile and make us have to submit two RIs. But I feel that at this point, you know, we could submit the RI and that the information from those three wells could then supplement that information in a short addendum to the RI or could be included as part of the FS. That information could be included as part of the FS.

There is not -- I mean, I think, also, in the Superfund process, you know, there are these milestones and these steps and this information is supposed to be submitted here and then you do this and then you do this. But it's really a continuous process that you're always going through and should be looked at as a continually -- you know, as an interim process. And there isn't really any one

place where you say, "Okay, we've finished with that. Now we go on." And we have to do all this stuff before we can finish with the next step.

MELCHIOR: Jon, could we take five minutes to talk about this?

BURIL: Actually, I think that's probably a good idea because I know I --

NOVELLY: Break for lunch, if you want.

BURIL: Yes, why don't we break. Does everyone have an agreement with that? It's 11:30 now. We could break for lunch and come back and revisit this a little bit and maybe move on. Because the next two operable units are actually -- I don't think they're nearly the same level of change that we're talking about here. I don't think there will be a problem with that. So why don't we do that, if that's agreeable with everyone. We can reconvene at 12:30? Sound good?

SWARTHOUT: Sure.

(At 11:23 a.m. a recess was taken until 12:51 p.m. of the same day.)

AFTERNOON SESSION

12:51 P.M.

ROBLES: We're ready to start again.

We left off with the Operable Unit Number 1, the discussion about the extra three wells that were going to go in place.

It's the consensus of NASA and JPL that we need to do this. The question is: How do we incorporate that into the process so that it can be utilized?

I guess EPA's position is that they want to see the RI go and then that the data generated from these three wells be put into the feasibility study so that there would be no more delays on the schedule. Is that correct?

SWARTHOUT: That is correct.

ROBLES: Okay. This is where we have an impasse. Our discussion is that we feel it needs to follow the process very strongly.

Is there a reason why, Brian, that has to be done the way that you want it?

SWARTHOUT: Well, there isn't -- I mean, the reason that I think that we can submit the RI now is that, and we were talking about it at lunch, I don't think that the additional information is going to

change your treatment alternative significantly. And the type of information that you will include in either your FS or your record of decision, or ultimately your record of decision will not be to the detail of specifying how many wells or how many extraction wells or pumping rates or -- I mean, I'm thinking in terms of pump and treat.

The only thing that would most likely be in the FS is the treatment alternative, the technology and then the cleanup levels. And that if the plume turns out to be bigger or smaller than we currently have information, then we can specify the number of wells, extraction wells in the RD/RA phase.

So I don't feel we need to have the control on that end of the plume to submit the RI.

ROBLES: Let me ask one question. Has anybody ever done a feasibility study?

SWARTHOUT: I have.

NIOU: Yes.

NAKASHIMA: Yes.

ROBLES: Correct me if I'm wrong. I'm the local idiot. A feasibility study has got to show everything that you plan on doing so that it can pass public comment so that when it gets designed it

matches what you stated.

MELCHIOR: It's the document from which the agency selects the record of decision and chooses the alternative.

ROBLES: Now, the detail in that document, how detailed does the document have to be?

MELCHIOR: It can get fairly detailed when you get down to the nine criteria, each of the criteria.

ROBLES: The matrix of alternatives, they all have to be --

SWARTHOUT: The alternative that you choose must meet all nine criteria. The first two criteria that it must meet are protection of human health and the environment and it must meet all the ARARs. The other criteria are just either balancing or modifying criteria.

So the question about the detail in the FS, I think that is open to a lot of interpretation. It doesn't necessarily say in any guidance or any regulation how detailed the FS and the record of decision must be. For example, with George Air Force Base, which we have written a ROD for, they kept saying, "Oh, we're going to have a pump-and-treat system and we're going to have 19 extraction wells."

And we kept telling them "Well, take out that number 19, because really what the ROD says is you have to clean up the groundwater to the clean-up level and the way you get there is up to you as far as the number of wells." Because, you know, we don't -- because at the time we didn't have enough information to specify the exact amount.

MELCHIOR: But the ROD specified that it would be a physical extraction system?

SWARTHOUT: It did specify that it would be pump and treat. It did specify the treatment technology, which was groundwater extraction and surface treatment.

Now, I don't know what you guys are thinking about as far as, you know, how you're going to clean the groundwater up or what your actual objectives are going to be for the remediation. But I think that when you determine what your objectives are you'll be able to determine what the technology will be even though you don't have those three wells installed.

BURIL: Let me ask a question, Brian. When you're determining the technology, are you in a position of eliminating technologies on the basis of constraints that prevent you from implementing it,

in other words, be they some physical constraint? Let's say a pump and treat will work. Okay. Let's take that as a given. If there is a physical constraint that prevents you from utilizing that technology, is that identified in the feasibility study?

SWARTHOUT: Well, it just so happens that one of the nine criteria is implementability.

BURIL: Okay. I was hoping you would say that.

SWARTHOUT: So if you determine that the treatment is not implementable, then you can eliminate that alternative.

Generally the way it goes is, you know, you're supposed to start with the whole universe of alternatives. And then as you go through your FS you will eliminate the majority of those alternatives. And then in your detailed analysis of alternatives you will compare each of those alternatives to the nine criteria. You eliminate the earlier alternatives based on five or six of those.

BURIL: The ones that are obviously not applicable you eliminate immediately and maybe you go through the detailed evaluation against all nine in order to establish which one is the most

feasible.

SWARTHOUT: Right. I can't remember the criteria exactly for the earlier elimination.

BURIL: I can't either.

SWARTHOUT: It's like will it meet ARARs? Is it protective of health? And some of the other nine alternatives.

BISHOP: I think the terminology is a prescreen of alternatives.

BURIL: Yes. And then detailed screen and selection.

ROBLES: You're saying, then, that data gathered from these three wells after you do an RI/FS can be incorporated into that?

SWARTHOUT: Data that you gather after, preferably in the FS -- I mean the purpose of the RI is to determine the nature and extent of the contamination. Obviously, we don't have the exact extent on that one site. But I still think you can submit the RI. The purpose of the FS is to choose an alternative. So if you're gathering more data either post-RI or during the FS, you could alter your alternative.

My impression is that you probably won't alter your alternative based on this information.

The ROD is like the legal document, so to speak, that specifies which alternative you will use and what your cleanup levels will be and what your ARARs are going to be. It does not specify, you know, how many wells you will install and what size tripping tower you're going to use and what your pump rates are going to be or what your catalytic oxidation unit is going to be or the size of those things. Those are all things that are specified in the RD/RA, which is your remedial design and your remedial action. So you may actually go out, you know, in your cases you will go out and collect additional information during your RD phase to refine the design of your system.

BURIL: Let me ask this, Brian: In a situation where the size or the degree of effort necessary to implement a given remedial action to meet the first two criteria, the protection of human health and meeting the ARARs, which I guess are the principal guiding force behind a lot of this and then the others kind of feed into that to mold a given scenario into the right shape --

SWARTHOUT: Those are referred to as the threshold criteria.

BURIL: Okay. If you run into a situation where

the threshold criteria can be met but the implementability is in question because of constraints placed upon a site-specific condition, would that alternative be viewed as being eliminated at that juncture?

SWARTHOUT: Well, I think the answer is it sounds like you're asking me the same question that you asked before.

BURIL: That's what I want to try and make sure I understand the answer.

SWARTHOUT: I mean, you will have to -- all the alternatives that you will carry into your detailed analysis will have to meet your first two criteria, the threshold criteria. And then the subsequent analysis will be based on the remaining seven criteria. Actually, the last two criteria, typically community acceptance and State acceptance, are usually incorporated into the process at the proposed plan. When you put out your proposed plan, then you take comments. But the other ones, like cost, implementability, short-term effectiveness, long-term effectiveness and -- I can't remember the last one. Those are the things you typically evaluate against during your detailed analysis.

BURIL: Okay.

SWARTHOUT: If you look -- I can bring it or send it next time -- in the CFR. I don't remember the section, in the 40 CFR. It goes through all those things and kind of explains in more detail what each of the alternatives is.

BURIL: Okay. Good.

ROBLES: The question still is: Do we do it on the RI or do we do it under the FS?

BURIL: I guess one of the things that I would ask in trying to evaluate this is, or one of the things I would point out, rather, is to reach ROD, which is really our desire at this point, we're going to need to be able to know whether a given technology is going to be applicable based on our evaluation of the FS.

When you're talking about the RI being the document which describes the nature and extent of contamination, I think that it's a question of to what degree of resolution, I guess is the word, you need to have that complete in order to decide what it is you're going to do.

In our case, taking site-specific considerations into mind, we have a situation where, making a gross assumption here that we do go to a pump-and-treat scenario. We come into a couple of

issues when we start talking about how big this thing might be.

Now, I agree that the technology is potentially feasible. But the ability to implement may be another question. And I'll point out the idea of physical size of a given plant. If we have to pump 5,000 gallons versus something much less, we physically, here on JPL, don't have the space to put in massive treatment plants. And, in fact, we would have to know, at least in gross terms, what we're talking about in terms of a size to know whether we could even implement something of that nature.

SWARTHOUT: Right.

BURIL: If we were in an Air Force base where we had several square miles of open area to deal with, that would be one thing. But we have a situation where we could potentially have a space consideration where we have to make a decision as to whether or not we allow people to have parking available to them, which could impact our operations, or we put a treatment plant there. And that kind of consideration would then go to a question, in my mind, of being able to implement it.

BISHOP: I'm going to throw something in. I'm sorry if I cut you off, Brian.

SWARTHOUT: That's okay.

BISHOP: We run into this quite a bit at the Regional Board. It's not always termed as implementability. But what is considered implementable by the site and what is considered implementable by the agencies may be a totally different thing.

I'm not trying to say that your considerations aren't valid, but if you're telling me that you can't put in a treatment plant because you don't have enough room, I'm going to say, "Well, you know, there are places you could probably make some kind of arrangement with the City of Pasadena, put it in the arroyo or over across somewhere else." There are places where you could put it. It might cost you more to pipe it through it. But that's your decision that your on-site operations are more important.

BURIL: Again, I recognize what you're saying. But take a look at the area we're in. We go to the west, we're in a residential neighborhood. We go to the east, we're in a private area that's going to be developed into a park. You go further to the east, you're in a residential area. You go to the south, you're in a County park. You go to the north,

you're up in the hills. If you go beyond that, you're still in a residential area. The opportunities to go off site as you're indicating don't exist. So we're forced to view what space we have on site.

And again, I raise this as a question as an example only of the potential for a given what you would term a design criteria being a consideration as part of the feasibility study.

SWARTHOUT: I think that that is the kind of thing -- I mean, if you're going to talk about the size of the system, that is the kind of thing that you will determine after you've gotten the information from the other three wells, from the remaining three wells.

But I would -- I'll just kind of take the hard line EPA position that Jon was talking about, is it is my impression that you are not going to use the implementability argument that you don't have space on the facility. Because I would just say "Build it in the arroyo. Talk to the City of Pasadena."

BURIL: And if they refuse?

SWARTHOUT: I don't even want to get into that. Because I doubt very much that you're going to be

able to use that type of an argument that you don't have room on the facility.

BURIL: I raise that as an issue because that kind of an issue is something that is very central to much of JPL's operations and many of those facets are out of our control.

SWARTHOUT: And you would have to pick an alternative that is implementable.

BURIL: But yet if we are going to do that, we have to know one is going to be eliminated as a result of something of that nature.

SWARTHOUT: You will have that information, I think, by the time you get to that point.

MELCHIOR: I guess our concern is, too, you've made a categorical hypothesis that there will be a physical extraction system installed as a result of what's down here. And I think that's a gross leap of faith.

SWARTHOUT: Gross leap of what?

MELCHIOR: A gross leap of faith. I mentioned earlier about whether or not the size of the contamination would lend itself to a sparging technology as opposed to a physical extraction. We've got plenty of in situ technologies which are fast gaining momentum in terms of their

implementability.

SWARTHOUT: I understand. My intention was not to draw any lines in the sand about what you guys are -- you guys will decide, you guys will write the document and decide what you want to do and we'll do the customary approve it or not approve it type of thing. So I'm not saying we're going to do pump and treat here, because we're a long way from making that decision.

BURIL: Sure. I guess we keep coming back to the same thing, that these key evaluation criteria within the nine criteria are going to be dependent on the configuration, and not only the lateral configuration of this contaminant area but the vertical as well. And what we see right now in some of the wells is relatively shallow, for this site, relatively shallow. That well that you requested as a central part of the quadrangle might indicate something completely different. It might indicate a much deeper contamination than what we had anticipated. We can't speculate at this time. But certainly that vertical component will have a gross impact on the alternatives that are selected. We're all concerned that, let's get that data so that we're all on a level playing field when those

decisions are made as opposed to writing two documents and then hoping that the agencies will re-evaluate the alternative selected during the ROD stage.

SWARTHOUT: I'm not even really -- I mean, I guess we could make -- I mean, I'm trying to figure out what the schedule will be beyond the RI. Because in my impression, you could write the RI now and then by the time you get to writing the FS you'll have that information. I mean, let's just assume that we agree that we don't need that information at this point. When do you think you're going to submit an RI?

BURIL: I'm not even going to speculate on that right now.

SWARTHOUT: I don't know if you want to answer now. My impression would be that by the time you submit the RI, finish the RI, by the time you finish the RI and begin the FS, you will then have that information. And that's the point at which you need it.

ROBLES: If you started today, Chuck, when can you get those wells in?

BURIL: I don't know, to be quite honest. If you started today --

ROBLES: The paperwork.

BURIL: I would have to go back and look at the individual schedule. But to actually have the wells physically in place and ready to sample, we're looking at at least a year.

SWARTHOUT: So in order to -- let's just step one step back. When could you feasibly start drilling at the earliest date?

BURIL: Assuming that we actually had agreement on all the things we're going to be talking about now --

SWARTHOUT: Right.

BURIL: -- my procurement process and Foster Wheeler's procurement process is painful. I can do most justice to it by calling it painful, without using an awful lot of expletive deleteds.

That is going to take, on the average, four to six months. Like I say, I wish to God I could get through that faster, but I don't seem to be able to.

Then the actual construction of the wells, based on about eight weeks, six to eight weeks construction time is basically what we're talking about. Isn't it, Mark?

CUTLER: I think we estimated about four months

to get the wells in, installed and developed.

BURIL: So say four months, then, as opposed to six, as I said. So we're then in the approximate ten-month time frame. Eight to ten months, if I can go down from six to four months in the procurement. I'm in an eight-month time frame to do the sampling. We're looking at --

MELCHIOR: Two months to get the data back and validated.

BURIL: Two months to get the samples into the lab, get them back and then to get the validation, we're looking at probably two additional months there.

CUTLER: That might be more like three months on that.

ROBLES: 13 months.

MR. BURIL: Tenth to the eleventh month, minimum time frame. Then to understand what that data is telling us is going to take a little bit of time, I would say that's probably at least a month or two, and then to establish how we report that and in what mechanism, be it through an addenda to an RI or in an FS or something like that.

BISHOP: You don't have to add that on to the end because that could be done during the whole time

that we're talking now. I mean that doesn't add --

BURIL: We can't do anything until we have the data, Jon. That's the only thing.

SWARTHOUT: But you can figure out your form patch. You know what data you're going to have --

BURIL: Once we have the data, we'll know what the format is, but then we have to put the data in that format. If it's a situation where we're going to be going back and changing the existing RI or assembling some kind of a document that says ignore this, it's in the RI and pay attention to this, all that still takes time. That's what I'm pointing out. Assembling the format that's not a big deal. We could come to agreement on that today, potentially. But to actually put the data in that format and have it ready for submission and so forth and get it through all the processes will take some time.

And I would say we're looking at at least a year before we're at deposition.

SWARTHOUT: Why don't you delay the FS for that year and turn the RI in now, start working on the RI?

I mean, I'm wondering like is the groundwater model going to change because of this?

Is the geology going to change because of this? Is --

BURIL: All of that is speculative because we don't have the information. We really don't know.

SWARTHOUT: My answer would just -- I would think those things wouldn't change. I mean, maybe they will. But my impression is they won't change.

BURIL: Let's make an assumption here that they do change.

SWARTHOUT: I think you have enough information around those areas that the overall picture of the base is not going to change where you're going to have to submit another RI.

MELCHIOR: I guess one of our concerns is you're not impacting on the overall end point of the schedule. That's the real issue here.

SWARTHOUT: I think you are.

BISHOP: I think you are. Because if you're talking about a year and a half before we even get to start reviewing the RI, the RI review is a huge amount of document to review. I mean, I think we all agree with that.

BURIL: Sure.

BISHOP: So that document, instead of having its review start up while you're working on this, is

going to then be put beyond that.

BURIL: Let me ask a question, then. Let's say we go ahead and we do it in the fashion that Brian is advocating and we come back and we say, okay, now we do know something else and now the RI complexion does change.

You're back into a position of having to do at least a partial, if not a full re-evaluation of the RI depending upon what it is you've found. So you've at least added some work onto it and maybe you've doubled your work, depending on what those data tell us.

See, no one can know what it's going to tell us.

BISHOP: I know what you're saying. But how many wells do we have out there now? 21. Right?

BURIL: On site we have --

NIOU: 16.

BURIL: 16.

BISHOP: 16 on site. So we've got -- we're going to have a total of 19 wells on site. We have 16 of them on site now. We have most of the information we're going to have for on site, not all of it. And I agree, there's always this opportunity that, you know, it could be totally different in

that area. But I'm just trying to think, do we have -- are we going to be changing major portions of our thought process, our conceptual model of the site?

CUTLER: There will be things that change. Probably the risk assessment will have to be revisited. Your maybe fate and transport, your plume definition. There is going to be several parts of the RI that are going to have to be redone. Maps will have to be just physically updated and changed.

BISHOP: I think that is a good point.

BURIL: I think you can see all of that. So when you're talking about extending the project as a result of not starting review, I think what you're actually pointing out is that you're going to end up doubling your review. Because you're going to have to take a look at what we submit initially and then again at what we change and draw comparisons; how much did it change; how much is that impact, as opposed to doing it one time and knowing that this is it. And therefore we go on from there.

NIOU: Question here. Are you sure that if you submit the report by the beginning of '97 that will be one-time issue, no data need to be fulfilled by

then?

BURIL: We can only make that assumption, Steven. There's no way to know that we have it. We've identified very agreeable, I think mutually agreeable data gaps now that are putting into question, I think, in our minds at least, that the nature and extent of the characterization of the contaminant plume has not been completed.

NIOU: It's almost, but not quite. I think part of the reason why Brian is asking for RI right now is we only receive piecewise data for the moment. It's hard for us to really have an overall picture of the whole thing. But if there's an RI coming out, it will be easier for the regular agencies to look at this and form our idea and tell you, "Well, we think this probably data gap, you probably need to do some more here" or "This good enough. Those three will answer all the questions."

We're in a much better position then to say. But if we wait until then, what if something comes up? Then we wait another year and a half?

BURIL: I'm going to turn that particular coin over for a moment. What it seems to me you're advocating is that we submit the RI and hold off on any kind of well drilling until after that's been

reviewed. Because if what you're telling me is that you want to identify the data gaps and fill those things, it would make sense that we would hold off on any additional work, submit the RI, identify all the data gaps and move forward rather than doing it in a fashion that says we have identified these things in a fashion that says, yes, we agree this needs to be done, let's go ahead now.

NIOU: This decision I have to leave to Brian.

BURIL: That's the other side of that particular coin. If you submit the RI with the idea you're going to identify all your data gaps and you want to be able to do it all at one time, then what we're doing here is a piecemeal approach and perhaps it's not the best way to do it.

NIOU: You may be right, but I have to turn this back to Brian for his decision.

BURIL: If you do it in that fashion, if you allow yourself the idea that, well, maybe we don't want to do it in a piecemeal fashion, you're going to extend the schedule even more. See, it's a catch 22 there.

SWARTHOUT: I think eventually, you know, you have to be able to draw the line and say, "Okay, we have enough data and we don't need to -- "

BURIL: I guess that's the point we're really coming to. Let me ask a fundamental question here. The goal overall is to get to the ROD so we know what it is we're going to be doing. Is that a general consensus?

SWARTHOUT: Well, I don't know. It seems like we're overstating that. And that is definitely a major goal, yes. But I don't think that we can hang all our -- all the information that we have in getting that.

BURIL: Then describe to me, Brian, from your perspective what priority of goals we should be focusing on. Because it's always been my impression that the regulatory agencies want to get to a point where we've characterized, we've determined the most feasible alternative, we've decided upon that formally and we're ready to build it.

SWARTHOUT: In that sense the goal is to get to the ROD, but it's also to get there in the most expeditious fashion. I think if we wait a year and a half we're going to be potentially delaying that getting to the ROD for at least a year.

BURIL: Let's look at this for a second. If we went ahead and submitted an RI now, I think that in point of fact when we go to do the FS, which is

going to be the basis of the ROD, that the likelihood of it being any sooner than February '97, based on the amount of time that we would have to take to build the wells and get all the data and evaluate and so forth, is going to change very little, if at all.

SWARTHOUT: For the FS.

BURIL: For the FS. So you're not in a position to go to a ROD, if that overall goal is to get to that point. That hasn't changed. It's a question of timing within the --

SWARTHOUT: So if you submit the RI in January of '97, are you then going to still submit the FS in February of '97?

BURIL: That's what our goal is right now, yes. I can't say that we would absolutely do it, but I would say that is our absolute goal. We don't know what the heck we would find. Geez, if we find some crazy thing down 500 feet at that center location that no one expected, then obviously things are going to change. But that would be our goal.

You would not see a change in the overall scheduling of reaching ROD by moving the wells back into FS or leaving them moved up into the RI. Because all that information has to be pulled

together in order to get to ROD. I don't think I hear you arguing that point at this point.

SWARTHOUT: Well, I'm not -- yes, but I --

BISHOP: I think one approach that we could take at this point, since we're actually saying the same thing, both sides over and over, in your opinion, you can't get to the FS without it, and in Brian's opinion, you can.

What we need to do is look at, okay, you don't really know what the schedule is off the top of your head. Let's look at what the schedule is in terms of drilling what the schedule -- where the actual timing for the writing of the RI and the FS are in relation to this drilling.

BURIL: Okay.

BISHOP: Let's see if between us we can come up with what seems to be the quickest way to get there, which makes the most sense. You know, it may be that the quickest and most sensible way to get there is to wait and do the RI/FS in one big chunk, maybe to do part of it now and do an amendment to the RI. I think the idea we all want to get to is we want to get beyond this point and --

BURIL: Absolutely.

BISHOP: -- we're all, you know, kind of

frustrated, you know, that we're looking at 18 months. You're frustrated because of the agreement, we're frustrated by it. But let's see if we can --

BURIL: Let's lay it out.

BISHOP: -- figure out a way to optimize what we have to work with. If you got a set of six months that you can't beat for your procurement, then we have to look at how can we fit that together to figure things out.

BURIL: I think it's a very fair approach.

Let us then basically lay it down in as much detail as we can regarding individual steps on the time frames that we've used being necessary. We'll give that to you and in some fashion we'll have to come to resolution, maybe an additional meeting, maybe telecon, whatever, some mechanism.

ROBLES: This could be done with a telecon, I think, because it's just the one topic.

BURIL: Get together on where we can see changes, potentially. That's a very good idea, Jon. I think it could be very beneficial.

Is that agreeable to the rest of the agencies?

SWARTHOUT: Yes.

BURIL: I'll take silence as acceptance.

NAKASHIMA: Yes.

BURIL: That's where it is, then, we'll lay it out.

ROBLES: How many scenarios? During RI. During FS. After FS. Right?

BURIL: I was actually kind of thinking of just what are the times independent of when --

BISHOP: How long is it going to take you to do the RI?

BURIL: If we showed how long and sequence that we're anticipating that you would have opportunity then to look at that maybe influence -- maybe you can do this quicker, maybe this would move here and we can make that condense somehow and so forth, give you opportunity to evaluate what our logic train is and have an opportunity to input on that, and then we can work back and forth on that basis.

BISHOP: And if you're going to do it that way, it's a little different way than I was thinking, but that will work, put in the whole, you know, the RI review, FS review, ROD.

BURIL: The whole smear up to finalization.

BISHOP: Of the ROD. Then changing components around, we may have a different insight on that than you do and we protect ourselves.

NIOU: If you want to do tradeability study, I would suggest a schedule be put in for FS.

BURIL: Say that again.

NIOU: If you want to do tradeability studies, put the schedules in the whole picture.

BURIL: That's understandable too. Let's try and pull that together. I don't think that's an insurmountable task at this particular point.

Dan, before I commit us completely with this, do you see a problem?

MELCHIOR: We basically thought this thing through, so --

BURIL: I think we've got a good portion of what you're talking about available to us now. We just want to be sure that we can give you what you need so we can talk about this in full and be sure we get everything straightened out.

ROBLES: Any other questions for OU-1?

Let's press on to OU-2.

BURIL: I'm hoping like heck this isn't going to be nearly as onerous.

What we're looking at for Operable Unit 2 is to first incorporate the grid discussion that we had before, get the samples and all that done and do all of those things. We're looking at -- and making

an assumption that we do no more soil gas work either here on the site or out in the arroyo. Maybe that's a point to be discussed at some future time. We're looking at June-July '96 for the RI, which is about I think six, seven months from where we're at now.

SWARTHOUT: Do you know what the current date is?

BURIL: I think the current date is the first part of October or something of that -- last of September, early October.

SWARTHOUT: I have October 5th.

BURIL: So we're talking about seven months, approximately. Again, that makes the fully disclosed assumption that we don't do anything else on site for source characterization. It's purely the additional arroyo work.

SWARTHOUT: I just want to make one point. Everything I just said about OU-1 I will say for OU-2. We could just copy it all over again.

BURIL: Now I've got to get clarification on what you mean by that.

NIOU: You mean RI -- he thinks that you already get enough information for the RI.

SWARTHOUT: My interpreter will speak for me.

ROBLES: He feels -- okay. I get it. You feel that --

BURIL: We can go to RI on OU-2 right now.

NIOU: And do the addendum for those 40 so --

SWARTHOUT: You know, Peter, I thought when you -- I don't mean to attack you personally. I thought when you came on to the project we were going to keep moving things going. And now all we're doing is delaying, delaying, delaying, delaying. It's just really frustrating for me.

ROBLES: I don't view it as delaying. I view it as more requirements being set by you, which delays the program. Because originally we thought we had all the wells we needed in OU-1 and that OU-2 was basically settled.

But then the question of characterizing the plume to the south of us on the main site, and also that you guys wanted us to look at the Arroyo Seco, which is no man's land. And that's added more requirements to it.

So the delay is directly proportional to the increase in demands of what you guys want. That's how I view it. That's how I see it. You can't ask for something and expect not to have a delay on the project.

BURIL: We had a factor of 12 increase in the scope on the soil gas alone. You know, that tends to throw a monkey wrench in schedules. We're looking at a 60 percent increase on the scope of work of wells on OU-1. And we don't know what's going to happen on OU-3 right now since we don't have any data.

So there's delays that are caused internally, which are unfortunate but we haven't been able to avoid. And there are delays imposed by the additional requests that the regulatory agencies have placed on us and that we feel are reasonable and have gone ahead and agreed to put into place. That's where I look at it from.

SWARTHOUT: I just feel like with a little creativity we could not have such significant delays.

BURIL: Certainly that's part of what we should look at. I agree. The delays are frustrating to us as well because I think that in point of fact the technical ramifications of this site are not nearly as onerous as the political. And trying to get to a point where we could actually get something done shouldn't be as difficult as it has been. But yet, we are identifying reasonable things to continue on

doing to assure ourselves that we are reaching the right technical decisions based on the data available to us. I think that's -- we know a heck of a lot more about this site today than we did when we first started this process; an awful lot more. And refining that knowledge to be able to come to a reasonable and defensible position on how we address it I don't think anyone should feel badly about. It may take more time, but nevertheless, it's time well spent.

One of the things, too, that I look at this is that if we were in a position of saying that we had an imminent risk to the environment or human health, then I would be much more concerned about the kind of delays that we're seeing.

But when it comes right down to it, the pathways of exposure that we're identifying now show that groundwater is the most likely exposure route. We don't have springs and so forth here so we don't have a concern there. The wells that supply water to the public all have what we could term an interim remedial action in place already so that the public at large is being protected.

So from that standpoint if we take a little bit more time to assure ourselves that we are

getting everything we need to reach a reasonable and defensible position, I don't think we're being unreasonable in doing so because we've already mitigated the immediate threat.

So . . .

ROBLES: OU-2.

BURIL: I'm basically done with OU-2. That was it.

SWARTHOUT: So what was the date?

BURIL: July '96. June-July '96 time frame.

SWARTHOUT: So that's a whole year to go out and collect the samples?

BURIL: Well, when you're talking about getting everything put together again, yes. That's basically what we're coming down to. It's a delay of the RI report itself of only about seven months. Eight months. Excuse me.

SWARTHOUT: Right.

MELCHIOR: This is assuming that the only additional field work is solely the Arroyo Seco sampling.

NIOU: Can that be incorporated into an RI addendum for OU-2 instead of putting the whole thing into OU-2?

BURIL: There's a principal concern that I have

when we start talking about addendums and so forth, and that is that we're talking about a generally increased cost to NASA overall when we start talking about having to do addendums and so forth. There are portions of an RI that you put out that are going to have to be changed with additional data that become available. Risk assessments would have to be re-evaluated or redone. We essentially end up doing certain portions of the project twice. I think that's something that we should consider as we're going into this, is are we in a position of being in such a critical mode of getting the information quickly in order to prevent potential harm to the public at large or the environment. As I indicated earlier, I don't think we're in that position. We've already mitigated those issues. And in large part, based on what we're finding out now, we're finding that there isn't that much of a threat posed by this site that we can identify right now. And whatever threat there is would be through the groundwater wells, and it's been mitigated by having the treatment systems in place and acting as an interim remedial action.

So while I can appreciate the way that the agencies want to accelerate this, and certainly I

agree, I would like to see it go faster, too, I think it's important to take a step back and say, when we're talking about an overall project management consideration, "Is it really necessary?"

NIOU: One of my concerns, I said before, is currently we do not have the overall picture of the site model. And therefore, if there are anything that we may suggest, we are handicapped for the moment. That's why it will be real desirable that we can see some --

BURIL: Let me ask what you're thinking of. Because currently you've had the data for OU-1 for a time. Did you get it at the last meeting? Is that when we gave it to you?

BISHOP: Yes.

BURIL: It was unvalidated at that point. And the numbers that you have today are the validated data. And they've changed not one iota. We've given you the first round of soil gas some time ago. And the second round is available now. We provided you that. We can provide you geological logs from the wells and so forth. That would give you additional information in that regard.

I know this is information perhaps in piecemeal, but we've been trying to be diligent in

giving you everything that we have available to us that we think you could use at this point.

I would ask if there's more information aside from the RI itself that you feel would be of benefit to have at this particular point, then by all means let us know what it is and we'll make every effort to provide it.

NIOU: For instance, geological data and the water level measurements and also like the -- we already have some history of the groundwater sampling data on the work plan. Therefore, the new ones with the water level measurements, that will help us greatly, including the geological. I don't know if Brian wants something more.

BURIL: I don't see a particular problem with that, to be honest with you. Certainly you're welcome to see it.

SWARTHOUT: I think part of the problem is kind of seeing it all together and also seeing how NASA and the contractors are going to be interpreting that data.

BURIL: That makes sense.

SWARTHOUT: It's still something we don't get out of just being given the data.

BURIL: I can appreciate that.

SWARTHOUT: I think if we wanted to do something like that, it would be worthwhile to have Foster Wheeler do a presentation about what their interpretation is or just to present the data and what they're thinking is on the conceptual site model.

BURIL: Dan, is that something we could reasonably do, say, in some near-term period of time between the submission of the RI and so forth?

MELCHIOR: Sure.

BURIL: We could do it for OU-1 because we're essentially at a point of saying we don't have any new information available to us.

MELCHIOR: Right. We're drafting sections as we speak.

BURIL: I think that's reasonable.

MELCHIOR: So the wells are surveyed in and we got water level measurements. It would take a little bit of time to get the most recent surface maps, of course, but --

BURIL: This would be the look-over. It wouldn't be with a lot of written back-up or anything of that nature. But we would have data supporting whatever we present.

MELCHIOR: Basically, we can walk through the

sections of the RI verbally. I won't say all of it because I don't have that in front of me. Certainly the risk assessment we won't. But we can walk through the pathways with you and things like that.

BURIL: Would that be of benefit to you?

SWARTHOUT: Yes, I think that would be. I would be just -- even not so much in the interpretation but just seeing the data.

BURIL: Seeing it presented in a cohesive fashion you can digest in one swallow, so to speak?

SWARTHOUT: Kind of get an overview of this thing. Yes.

BURIL: I don't see why we would have a problem with that, quite frankly. In fact, it may even help us solidify our own ideas on how to present the data based upon input from these folks when we make that presentation. That could actually be very beneficial.

Why don't we shoot for that. In fact, I'm going to make a suggestion, and not a recommendation, but a suggestion that we shoot for it for, say, no later than the next RPM meeting. In fact, if we can pull something together sooner --

MELCHIOR: Make it at the RPM meeting. Let's make it a definitive element.

BURIL: What I'm saying, though, is after I sit with you guys and talk about what it is that we have to do, if we could actually pull it together sooner, then perhaps it would be worthwhile doing it sooner. That's what I want to get from you folks before I make any kind of commitment. I would say absolutely no later than the next RPM meeting and perhaps sooner.

SWARTHOUT: The next RPM meeting would be fine, I think.

BURIL: Okay. Any other thoughts in that regard from Penny or Jon?

BISHOP: I guess my concern is that we kind of keep in mind when we're getting ready to do this or when you're getting ready to do this, to prepare, that to kind of keep the whole -- you know, all the different phases in mind to put it together.

What I'm trying to get at is I know maybe some people here are more familiar than me, but I get the well information today and the map is up there, a map so that I can see where these are.

BURIL: What you're looking for, you prefer a stand-alone package rather than the information with the assumption that you remember what's going on? Is that correct?

BISHOP: Exactly. Think about it in terms of, okay, this is everything that we're looking at. We're going to look at our initial borings, we're going to look at our soil gas, we're going to look at our water, groundwater. Let's put it all together so there's not an assumption that people remember where Building 132 is and, you know, things like that.

MELCHIOR: Are you looking for this presentation to be both operable units, then, or just Operable Unit 1?

BISHOP: It depends on what you're looking at. When we started this discussion on Operable Unit 2, that's why I was, but --

BURIL: That's fine. I'm wondering whether we'll have our validated data back from our soil samples. I think we will by then. If not, we can just say it's preliminary and we'll wait for the data to be validated and any changes we'll let you know about as it progresses. I think that's certainly not an unreasonable thing to do. We want to be sure that you're up to speed on these things so that we can be certain that you know at least as much as we do and have an ability to assimilate and process that data.

Okay.

ROBLES: 3.

BURIL: 3. 3 we're looking at essentially the same time frame as OU-2. Probably July '96. And that's including the second round of sampling that was indicated that was going to be requested by the agencies.

So we'll be ready to sample, hopefully, three weeks, four weeks for the first round?

RICHARDS: Oh, Yes.

BURIL: And the second round, then, would be a quarter thereafter, which I believe was the agreed upon time frame.

Which would put us, what, September-October time frame, approximately. And generating all the rest of the data validation and the reports and so forth. This one is, in my mind, maybe a little tentative. We might be able to, and I'm saying might, be able to accelerate this a little bit, depending upon how things work out in the field. I think that this time frame is one that may be able to be condensed to some degree. But again, that's something we would have to take a look at. I think that would be reasonable for us to put our logic and time frames in front of you again much

like we're talking about OU-1 so you have an opportunity to take a look at it and understand it.

BISHOP: Right. I think it would be helpful for me, because when I hear you say "Okay, get your data sampling in September," so that means, you know, three months, you'll have it back in January and it's going to take you seven months to write the report, which, you know, it seems to me --

BURIL: That's why I want to present it to you so you have an opportunity to see why we're talking about these time frames. I think that's only reasonable at this point. And we can talk about, well, how can we phase things, do things a little differently and come together with maybe a better schedule.

BISHOP: Great.

7. ACTION ITEMS

BURIL: With that, I think we're down to number 7, which isn't on there, but probably should be, and that was the review of the action items from the previous meeting. I don't know. Before I leave number 6, are there any other comments or questions from you folks?

No? Okay.

NIOU: Brian, how about --

SWARTHOUT: Oh, yes. Before we move on, this kind of goes I think for all -- for the entire site, although there's only wells at OU-1. What about -- I'm trying to get an idea about what we're going to be doing for long-term groundwater monitoring. And we do have two rounds from last year. And it would be -- my opinion is that we should have two rounds from every year from here until --

ROBLES: Ad infinitum forever?

SWARTHOUT: I'm just saying I think we should be collecting additional rounds of groundwater samples for this year and, you know, whatever next year, however we determine we need to have our long-term groundwater monitoring plan. But I think it's something we should think about ahead of time so that we have a full set of groundwater data and that when it comes time --

MELCHIOR: Let's talk about what elements within the monitoring you'd be looking for based on what types of things are you going to want to analyze?

BURIL: First let me back up and take a more conceptual viewpoint of this. I'm not going to argue the issue of monitoring at all.

But what I'd like to know is in the monitoring program what are the goals for obtaining the data? What are the purposes for the data once it's been obtained? What are those goals? I think that's going to shape in large part how we approach a monitoring program.

SWARTHOUT: I think the goal, as far as from my position is, or from my point of view is to have a long-term set of groundwater data so that we have information, since we have collected two rounds in '94 -- what year are we in now? '94. That we'll also have, you know, a comparable set of groundwater data for '95 and '96, as long as we determine it's necessary so that we will be able to determine the movement of the plume or how the plume changes over time.

And I don't think it's a good idea to have, you know, two rounds now and then not collect another two rounds until '97 or something like that.

BURIL: I can't argue that. I think that's very true.

Okay. Well, with that in mind, then, we've kind of looked at a potential monitoring scheme. I'm going to go on memory as best I can, with Mark and B.G. kicking me in the ear verbally to

remind me where I go astray here.

What we were looking at is basically, and this will make an assumption that OU-3 and OU-1, with all the data, have been found to have no metals considerations. You've got the data for OU-1. I'm thinking OU-3 will follow in kind as far as metals concerns go, that there are no concerns of metals and therefore we would not view metals as an issue and would not monitor for the metals.

We would, obviously, monitor for volatiles. And we would look at those principally in the wells where we have found concern in the past. There are certain wells where we've never had a problem or only maybe a couple of hits.

MELCHIOR: Certain screens.

BURIL: Certain screens within deep wells or multiport wells where historically we've only had hits in the upper screens as opposed to all five or whatever number there are. For example, MW-1 has historically always been clean. We would propose that that not be part of the monitoring program. Did we include MW-15?

CUTLER: And 9.

BURIL: And 9 as ones to monitor?

CUTLER: No. 15 and 2. I'm sorry.

BURIL: So 1, 15 and 2 would be the ones that we would propose not monitoring.

CUTLER: Well, 2 it's part of --

BURIL: 2 is built incorrectly, anyway. It was done by the Army Corps and they stopped drilling before they actually hit water. So it makes things a little more difficult to deal with.

The ones that we would look at, of course, would be --

RICHARDS: Water levels on those.

BURIL: Yes. We would have water levels on all of them. In fact, we have transducers in these standpipe wells that give us -- are we still getting every 15 or half hour?

CUTLER: We're getting four readings a day still.

BURIL: We cut it back, then. We had so damn much groundwater data we didn't know what to do with it.

What we're looking at now is for the wells that we would leave in place, that we would monitor semi-annually, meaning every six months. For the multiport wells we would analyze only the top two screens?

CUTLER: Three.

BURIL: Three. Okay. And all of the analyses would be completed for the volatile organics portion and we would follow level 3 QA/QC as opposed to level 4 at this juncture. And we would still do the 10 percent check, but we would not have everything done in level 4 as we have in the first rounds of Operable Units 1 and 3.

And that would continue for a period of time and whatever that period would be would be based on the data, basically. That should give us a fairly reasonable understanding of how the groundwater concentrations are changing and it will give us -- if we evaluate all of the groundwater level data it will give us a very intimate understanding of what is happening with the groundwater flow regimes.

So I think that could be a reasonable starting point for a monitoring program. And on the basis of the data that we generate, we may want to increase certain locations or decrease certain locations, depending upon what it tells us. And that would have to be based on whatever length of time and number of data we feel comfortable in looking at.

SWARTHOUT: That sounds fine.

BISHOP: I would like to see, you know, once again, just a summation of what you're doing and what the rationale for each of them, for not including. Because what we normally would do at the Water Board is you'd sample quarterly for a year and then after that we'd make a decision with you on what to cut it back to. I don't have a problem with the idea, okay, this is a different situation, we've been doing it semi-annually, you know, that we consider something else.

But if you could put together, okay, these are the ones we're not going to sample and this is why, these are the levels we're not going to sample and this is why, and just put that together in a short little --

MELCHIOR: A letter.

BISHOP: Yes, just a letter.

BURIL: Would you rather see that in a letter form or would you like to see that as an incorporated part of the presentation?

BISHOP: I'd rather see it in a letter form. Then I can look at the data and say does that make sense to me, instead of trying to do it right now, which is what I was trying to do while you're talking.

SWARTHOUT: I would like to see actually something a little bit more along the lines of a report, a long-term groundwater monitoring report. It just lays it out, kind of what Jon is talking about, but I think a little more --

BURIL: When you say "a report," are you talking a report on the data themselves that are generated, or a proposal for the monitoring program?

SWARTHOUT: I would say a proposal for the long-term monitoring. I can try to give you an outline about what kind of information I would want to get. I can't get it right off the top of my head, but something about which wells, like Jon was saying, why not some of the wells, the analytical methods that are going to be used, the rationale that you would give for only going to level 3 on the data, which screens and which wells and which analytical methods. Just so it's kind of a complete monitoring report.

MELCHIOR: Can you scribble that out and fax it to Chuck? I mean, it doesn't have to be formal or anything.

SWARTHOUT: Right.

MELCHIOR: Just so we know what your expectations are.

BURIL: Let me be sure I understand this. Dan is going to give you something informal. Are you looking for something informal as our proposal as a monitoring program to be incorporated into the --

MELCHIOR: I just asked him for his request in an informal, what he wanted in the proposal so we have all the elements of the proposal.

BURIL: I misunderstood. I thought you were saying make a proposal and funnel it back to them.

SWARTHOUT: No. I would like it to be more formalized in a report from you guys, something that we could use over time, to maybe even have some criteria in there about, and I know I can put this down on paper, but how we would evaluate whether we wouldn't want to add or subtract wells from the long-term monitoring or something like that, you know, in the event that there's a well that has, you know, a low level of contamination now, and then for the next two or three rounds it comes up zero, we can eliminate that screen or something like that. What I would like would be a long-term monitoring report that we could use.

BURIL: A proposal. And then identify -- I assume there's going to be some form of a reporting format established as a result, maybe just laying

that whole thing out and putting it down.

B.G. is down there shaking his head like, oh, God, here it comes again.

Okay. That's reasonable. I think we can do that for you. We should be able to generate that easily well before the next RPM meeting. I'm going to look at Dan and say I'd like to look at something in graph form in a couple weeks, something we can evaluate and then be prepared to send off to Brian, Jon and Penny.

MELCHIOR: That's reasonable.

ROBLES: Any other discussions?

MELCHIOR: I guess before we generate that, Brian has indicated that he has certain requirements, Chuck. Brian was indicating his requirements for this proposal. So I just ask if he could hand scribble those and fax them to you.

BURIL: Yes. I think that's a great idea.

MELCHIOR: So that we know what --

BURIL: I thought you wanted to hand scribble a proposal and send it to Brian. I was thinking, no, no, no, wait a minute. I didn't like that idea.

MELCHIOR: "No monitoring required."

No. That way we're sure that we cover everything that you want, we don't have an intricate

process.

SWARTHOUT: Right.

BURIL: I think that would be --

NOVELLY: If you want it. Otherwise I could take it back to the --

BURIL: Okay, let's drop it off.

While you were gone we indicated that, one, Brian was going to take an action to get to us with the requirements that he would like to see fulfilled in a monitoring program proposal. And once we have that, a couple weeks from our receipt of that, we would have a draft from Foster Wheeler to review, and hopefully no more than a week after that. So say in about three or so weeks we should hopefully have something available to the regulatory agencies as a proposal on a long-term monitoring program.

(Ms. Nakashima leaves the conference room.)

BURIL: All right. I guess we're down to the last part, then, which is the action items, and thank you for handing me this.

Brian, apparently you suggested last time that we do some additional sampling of some of the screens at some wells for volatiles and we need to

discuss this with NASA and Foster Wheeler. I'm not recalling that conversation at all. Do you want to just forget that?

MELCHIOR: That was probably the long-term monitoring we talked about.

BURIL: Is that the long-term monitoring?

SWARTHOUT: Yes.

BURIL: Okay. We just talked about that.

SWARTHOUT: Right.

BURIL: I think we can close this action item but leave the one that we just made open as to getting the informal review and then the proposal for the long-term monitoring.

SWARTHOUT: Are you looking at the minutes from last time?

BURIL: Yes. Page 32, top of the page, A.

SWARTHOUT: Oh, okay. There you go.

BURIL: Secondly, let's see, NASA/JPL is going to meet with Foster Wheeler to discuss the chain of events and approach for OU-3. The goal is getting in the two sampling rounds without throwing off the schedule for ROD. We'll set up a telecon to discuss that.

I think we've addressed that in part at least by saying that we will provide you the

breakdown of the schedule that we identified today, as being next summer and give you opportunity to review that and then we can go from there.

Brian, you were going to speak to Dan Stralka about the exposure assessment and get back to us.

SWARTHOUT: Right. This was for purposes of the risk assessment.

BURIL: Right.

SWARTHOUT: Let me just start off by saying I think it's really important when somebody starts doing the risk assessment that we might want to get them together with Dan and talk about how the risk assessment is going to be done, especially for things like the exposure assessment.

But what I was asking Dan about is when we do the risk assessment, should we take the highest hit and use that for the exposure assessment or should we, you know, take an average over the entire plume, something like that, and use that for the concentration for the exposure assessment.

What he had said to me was it would be fine to take an average over the entire plume because that is probably how somebody would be drinking the water in the event that they will be

drinking the water. They probably wouldn't be putting a well into the center of --

BURIL: So an average across the whole plume area is going to be --

SWARTHOUT: Yes.

MELCHIOR: But we want to get that going pretty quick, Chuck.

BURIL: In fact, is it possible, Brian, to -- I guess actually we don't need it. That's good enough.

I was going to suggest that maybe you might put that in writing to us. But I don't think that's necessary if it's in the meeting minutes, if you'd agree with that.

SWARTHOUT: Yes. Where is the person that's going to be doing the risk assessment?

MELCHIOR: In Washington, D.C.

SWARTHOUT: I'll talk to Dan. You can put it down as an action item that I'll talk to Dan and try to figure out some way to coordinate.

MELCHIOR: I think just for a cost saving benefit we could do that telephonically.

SWARTHOUT: Yes.

MELCHIOR: And come up with an agenda between Dan and my person. That way all the items are at

least identified to discuss.

SWARTHOUT: I agree. It's been my experience in both human health and the ecological risk assessment that there is a fair amount of subjectivity on how they're done. So I want to make sure that the people who are doing them are going to be -- the people who are doing it and the person from EPA who is going to be coordinating it are going to be communicating about the specific methods that they're going to be using.

MELCHIOR: My person has been badgering me about that, so . . .

SWARTHOUT: So I'll try and -- I'll look into that.

BURIL: Okay. Are we up to D, then?

So you're going to take an action to set up with Dan, and then we need to take the action to set up a telecon on the risk assessment. Okay.

Letter D, the agencies will get together and come up with a proposal for what they want NASA/JPL to do regarding the Arroyo Seco issue so we can respond to that.

Well, we talked about that at length to some degree today. I guess -- what approach do we want to take with that now? I don't know if we

reached resolution on how we're going to address that.

SWARTHOUT: I think from Penny's point of view, I think it was just if you guys wanted to put into writing the proposal that you had for doing that additional sampling, that would probably suffice.

BURIL: That sounds fair. I don't see any reason whey we wouldn't want to do that. Perhaps we could work toward having that available at the same time as the monitoring proposal?

MELCHIOR: I think that's a wise move.

BURIL: We can put all these together, then.

The next meeting, 10:00 A.M. Wednesday, May 10th. Well, we're here.

Penny is going to get back to us on soil vapor data but she needs the upcoming data to do that. She now has that. So I guess that one stays open for the time being since we don't know exactly -- I don't remember exactly what she was going to get back to us on. If anyone else does.

SWARTHOUT: I don't remember.

BURIL: I think that's all the action items that we have.

Judy, do you want to go through your list there so that everyone is clear on where we stand

for this meeting's actions?

NOVELLY: Sure.

NASA/JPL will provide a letter proposal for the arroyo investigation.

The agencies will provide input on specific goals of the Arroyo Seco investigation and how responsibility for any waste found will be determined.

NASA/JPL will provide a letter proposal for installation of three additional OU-1 wells and the agencies can approve this as the amendment for the work plan.

NASA/JPL will provide a schedule plan showing how the rest of the project will be laid out. And we'll have a meeting with the agencies to discuss this and this will include the RI, the review, the FS review, ROD in separate sections in case we have to shift anything.

Foster Wheeler will do a presentation of an overview of the data and will amount to a walk-through of the RI verbally. This will be prepared for the next RPM meeting.

Brian will get us requirements for a monitoring plan proposal.

NASA/JPL will send a proposal on long-term

monitoring and Dan and Brian will set up a telecon for risk assessment.

Did I miss anything there?

SWARTHOUT: There was one, I think it was either the first or second one about providing some guidance about dividing up the responsibility.

NOVELLY: One of the things we talked about was you were going to give us specific goals, what your goals for the Arroyo Seco investigation are and in that you would note how you would determine responsibility for any waste that's discovered in the arroyo.

SWARTHOUT: That I will not be able to do. I just think that's like a legal issue that I won't be able to address here at this time without kind of -- if I go to my attorney and ask her that question, that's too vague of a question I think at this point.

BURIL: When would you envision that kind of a question to --

SWARTHOUT: I imagine that would come up if we actually find something. I'm just trying to think like how would we determine now on a generic level who would be responsible for what based on the fact that we don't even know if there's anything there

and what's there.

BURIL: Okay. I can understand.

SWARTHOUT: See what I'm saying?

BURIL: Yes. It is a discussion and speculation, of course. I can understand that.

SWARTHOUT: I mean, yes, I'm not sure I would know how to come to those conclusions, personally.

BURIL: Okay. I guess one of the things, though, that we would like to have some general idea about is, given the fact that the arroyo is a multiple-user kind of an area, what kind of guidance, if any, can you give us in terms of how EPA or the other regulatory agencies have handled these kind of situations in the past?

SWARTHOUT: Right. I just think if it's something that is demonstrated to be from NASA, then it's likely that we would ask you to clean it up.

But if it's something that you can demonstrate is not from your operations here, then I think obviously we're not going to ask you to clean it up, and especially because you don't own the property. I mean, if you own the property, you would have to clean it up regardless of --

BURIL: I guess one of the things that I think Pete has a concern -- he had to run off to the

doctor, unfortunately. But one of the concerns that he has is for those issues which are neither black nor white but in that gray zone.

SWARTHOUT: Right. That's the kind of thing that, unfortunately, I don't think we're going to be able to give you too much information about at this point.

BURIL: If you would, Brian, I don't think we'll make this an action, but if you would during the course of your work, if you could maybe identify situations and let us know, I think that would be very beneficial.

SWARTHOUT: I can ask my attorney and see what she says.

BURIL: Give us some indication of what it is that we might be dealing with down the line. It would be very helpful to us.

SWARTHOUT: Okay.

BURIL: I guess we're down to trying to schedule the next RPM meeting, then.

It's my understanding that, Brian, you are still going to be with us as of the next RPM meeting?

SWARTHOUT: Yes. Before the end of the meeting, I just want to say that kind of at the end of this

project, at the end of this meeting I'm kind of switching over to a new project manager and it's going to be a woman by the name of Debbie Lowe, which Jon knows very well and he can vouch for her personality.

BURIL: But will he?

BISHOP: I could. She's quite good. I worked with her in San Gabriel for a number of years.

SWARTHOUT: She's been with EPA for a long time. She's been in federal facilities for about a year. I think between now and the next RPM meeting she and I will be coming down to visit the site and I will be at the next RPM with her so that there will be as smooth a transition as possible.

She sits right near me. I'm kind of her mentor in federal facilities so I'll be working with her a lot, be it on this site or other sites. So it's my intention that the direction of the project won't change because she's here. I don't think that things have really changed too much as a result of the switch between Michelle and I.

BURIL: Not in so much as EPA's involvement, no.

SWARTHOUT: So that's all. I just want to say that it wasn't my choice. I actually really enjoyed working on this project a lot.

BURIL: We enjoy having you. I voice a personal opinion that I wish you were staying.

SWARTHOUT: Yes, if I had my druthers, I would be staying. But some other people left so it's kind of for the good of the agency. I'm losing NASA and taking on another site.

BURIL: So dedicated.

SWARTHOUT: Right.

BURIL: You should be proud of yourself.

Well, Brian, for whatever it's worth, I want to extend my personal thanks and best wishes for where you're going and good luck in doing all the things you're going to be doing in the new job.

SWARTHOUT: Hopefully it will be as pleasant as NASA.

BURIL: Certainly we'll miss you because you've been very helpful to us in trying to keep the project on track and certainly you're one of the most reasonable and pragmatic people I've had the good fortune to work with at EPA. I want to thank you for that as well.

SWARTHOUT: Thank you very much.

BURIL: All right. Three months from now is sometime in August. Early part of August or latter part of July. Does anyone have a preference?

MELCHIOR: August.

BISHOP: August over July.

SWARTHOUT: Wait. Let me look at my notes from yesterday.

MELCHIOR: The 10th. The 9th is three months from yesterday.

BURIL: I prefer the 10th, if that's at all possible, only because I normally have Thursdays wide open and I can just keep it that way.

Does anyone have a --

SWARTHOUT: I think that's okay with me too.

BURIL: I am going to ask one thing, and that is that if for whatever reason we --

RICHARDS: 10th?

BURIL: 10th of August. If for whatever reason this needs to change, that we make that change as far in advance as humanly possible. Part of the reason we couldn't start any earlier today is because when we changed, this conference room became unavailable because of a couple things going on and really threw a loop into things on our court reporters and Dan's schedule flying all over the bloody country, and so forth. Just a request if we do need to change it, that we do that as soon as we possibly can and make every effort to stick to that.

SWARTHOUT: So is it at 9 o'clock?

BURIL: We can tentatively set it for 9 o'clock. I don't see any reason we shouldn't.

NOVELLY: The earlier the better.

BURIL: Is there anything else?

Well, then I'm going to say the meeting is over. Thank you all very much.

(The proceedings adjourned at 2:12 P.M.)