

Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Drive
Pasadena, California 91109-8099
(818) 354-4321

NAS7.000009
NASA - JPL
SSIC No. 9661



March 19, 1993

Refer to: 93-066.CLB:11

A handwritten mark, possibly a signature or initials, located to the right of the 'Refer to' line.

Michelle Schutz
U.S. EPA, Region IX
75 Hawthorne Street, M/S H-9-1
San Francisco, CA 94105

Dear Michelle:

Subject: Meeting Minutes From March 9, 1993 Scoping Meeting

Please find attached a copy of the subject minutes. Since this is a new format, your specific comments regarding the structure of the minutes would be greatly appreciated.

Should you have any questions please call me at (818) 354-0180.

Sincerely,

A handwritten signature in black ink, appearing to read 'Charles L. Buri'.

Charles L. Buri, P.E.
Manager, Environmental Affairs Office

Attachment

bcc:

A.G. Brejcha
D.S. Huff
J.D. Lafontan
K.A. Lievens
J.A. Novelly
R.C. Pool
W.S. Shipley
M. Scarbrough

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Penny Nakashima
Cal EPA
1011 N. Grandview Avenue
Glendale, CA 91201

Dear Penny:

Subject: Meeting Minutes From March 9, 1993 Scoping Meeting

Please find attached a copy of the subject minutes. Since this is a new format, your specific comments regarding the structure of the minutes would be greatly appreciated.

Should you have any questions please call me at (818) 354-0180.

Sincerely,



Charles L. Buri, P.E.
Manager, Environmental Affairs Office

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Bruce Ross
URS Consultants
2710 Gateway Oaks Drive
Sacramento, CA 95833

Dear Bruce:

Subject: Meeting Minutes From March 9, 1993 Scoping Meeting

Please find attached a copy of the subject minutes. Since this is a new format, your specific comments regarding the structure of the minutes would be greatly appreciated.

Should you have any questions please call me at (818) 354-0180.

Sincerely,



Charles L. Buri, P.E.
Manager, Environmental Affairs Office

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JPL

March 19, 1993

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Hank Yacoub
L.A. Regional Water Quality Control Board
101 Centre Plaza Drive
Monterey Park, CA 91754

Dear Hank:

Subject: Meeting Minutes From March 9, 1993 Scoping Meeting

Please find attached a copy of the subject minutes. Since this is a new format, your specific comments regarding the structure of the minutes would be greatly appreciated.

Should you have any questions please call me at (818) 354-0180.

Sincerely,



Charles L. Buri, P.E.
Manager, Environmental Affairs Office

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Pasadena, California 91109-8099
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JPL

March 19, 1993

Refer to: 93-066.CLB:11

Tizita Bekele
L.A. Regional Water Quality Control Board
101 Centre Plaza Drive
Monterey Park, CA 91754

Dear Tizita:

Subject: Meeting Minutes From March 9, 1993 Scoping Meeting

Please find attached a copy of the subject minutes. Since this is a new format, your specific comments regarding the structure of the minutes would be greatly appreciated.

Should you have any questions please call me at (818) 354-0180.

Sincerely,



Charles L. Buri, P.E.
Manager, Environmental Affairs Office

Attachment

**REMEDIAL PROJECT MANAGERS' MEETING MINUTES
NASA/JET PROPULSION LABORATORY CERCLA PROGRAM
9 MARCH 1993**

Attendees: Organizations represented at the Remedial Project Managers' (RPMs') meeting included the following:

- U.S. EPA (EPA)/Federal Enforcement Branch, Region 9, San Francisco, CA
- California EPA/Department of Toxic Substances Control (DTSC), Region 3
- NASA, NASA Residence Office, Jet Propulsion Laboratory
- Los Angeles Area California Regional Water Quality Control Board (RWQCB)
- California Institute of Technology (CALTECH), Contractor to NASA
- Jet Propulsion Laboratory, Contractor to NASA
- Ebasco Environmental, Contractor to JPL
- URS Consultants, Contractor to EPA

A list of individuals attending this RPM meeting is attached to these minutes.

OBJECTIVE:

The purpose of the NASA/Jet Propulsion Laboratory meeting held on 9 March 1993 at the Jet Propulsion Laboratory in Pasadena, California was to discuss previous source identification efforts and selected administrative issues.

TOPIC: MISCELLANEOUS ITEMS

EPA Report "Aerial Photographic Analysis of the NASA/Jet Propulsion Laboratory" was distributed by EPA. JPL requested comments from the agencies. No comments could be made at this meeting, as the agencies had only received the report very recently.

TOPIC: PREVIOUS SOURCE IDENTIFICATION EFFORTS - DTSC CONCERNS NOTED ON AERIAL PHOTOS

Discussion:

EBASCO gave historical data on locations identified from photographs for possible investigation in response to a written request for more information from DTSC. The locations were broken down by the year of the aerial photograph on which they were noted.

DTSC's handout from the January 15-16 meeting is attached to these minutes.

The historical information discussed is as follows:

1954

North of Bldg. 67, "Open Storage Area" - The area was used for scrap and construction material storage.

South of Bldg. 78, "Lagoons" - This was a concrete-lined, water-filled channel used to test aerodynamic factors of torpedo designs. The photo shows vegetation along the side with irregular shadows from trees on the edge.

South of Lagoons, Impoundments - This was a bermed area with vegetation in the middle used by the City of Pasadena as a dump for metal shavings, wood scraps, and glass. There are no reports of liquid disposal at this site. At the time of the aerial photo, the area was owned by the City of Pasadena.

DTSC asked whether JPL was aware of the previous use of the area as a dump when they purchased the property. JPL responded that they were unsure if this information was known at the time of purchase.

DTSC requested information on the types of metals disposed of at the dump. EBASCO responded that the metals consisted of tin cans and metal shavings.

JPL noted that JPL hadn't disposed of anything at the site either during its ownership or during the City's ownership. DTSC stated that NASA/JPL was responsible for any materials on the site.

Near Bldg. 114 - This area was a horse farm. It was not owned by JPL at the time of the aerial photo.

1964

Bldgs. 156 & 125 - DTSC noted that this comment was to address a concern regarding the use prior to development. Ebasco noted there was no known storage of hazardous materials in this location.

Lagoon East of Bldg. 150 - EBASCO stated that the aerial photo shows the foundation excavation for the 10-foot Space Simulator Building which was completed approximately one year after the photo was taken.

Area North of Bldg. 80 - DTSC noted that Building 148 is currently on this site. DTSC asked if any testing had been performed behind the magazines identified in the area. EBASCO said that propellants were never tested in this area. The area was a soils lab and a directive was issued to prevent disturbance of the soils surrounding the building. The area had a small dry wash and a seepage pit that was eliminated from the list of investigation sites because it only contained

water from a hand-washing sink at the soils lab. There were no chemical labs in this building at the time of the photo.

Building 78 - DTSC asked why the building was demolished. EBASCO stated that the demolition was part of normal facility changes that remove old buildings to make way for new ones. EPA requested information on what activities took place at the building. JPL stated that the building was not identified as a problem area. EBASCO said that two septic tanks had been removed but had shown no reason for concern. EBASCO noted that Buildings 78 and 113 will be torn down in the near future to make way for parking structures.

Bermed Area North of Building 183 - EBASCO stated that this was a construction area with an excavation for landscaping and the fountain that is still present in the "mall" area of the laboratory.

South of Building 168 - EBASCO stated that the area was under construction and that it had previously been a part of an equestrian park.

Action:

EBASCO will inform the group of the previous uses of Building 78.

EBASCO will inform the group of the previous uses of Building 183.

1972

Flat Area Between Buildings 148 & 197 - JPL stated that the area was and is not flat. There is fairly rugged terrain with steep slopes. EBASCO noted that disturbance of some of the vegetation in the photos was caused by the installation of fire control sprinkler systems.

1992

Flat Area North of Building 248 and Above Road - JPL noted that this area is a gunited slope. EBASCO pointed out a small retention area that picks up drainage water from the slopes.

Flat Area Between Buildings 248 & 149 - JPL stated that the area had a magazine for rocket propellant storage only. The magazines were inspected approximately two months ago. They were and still are empty.

TOPIC: PREVIOUS SOURCE IDENTIFICATION EFFORT - RWQCB COMMENTS FROM PREVIOUS MEETING

EBASCO responded to written questions from RWQCB. The questions are appended to these minutes for reference.

Source Identification

EBASCO noted that there is no correlation between pit numbers in the Slade Report. There were also some errors in the report regarding the number of test pits that were dug. Slade dug 8 test pits. The northernmost pit was for background readings on the site. Pit numbers 2, 3, and 4 were associated with the Bldg. 59 cesspool. Slade located the cesspool in pit # 3. This location correlates with boring # 16 in the Ebasco work. Ebasco boring #13 correlates with Bldg. 65. Slade location # 13 is under the present Bldg. 302 and location # 16 is on the front porch of Bldg. 303. JPL and EBASCO explained that the locations had been studied for access, including slant drilling, but to date no solution could be found that did not endanger the operations in Bldg. 302. RWQCB noted that up gradient and down gradient wells as close as possible to the building should be considered. EBASCO suggested collecting passive soil gas data rather than installing wells. RWQCB said that because putting a building on the site may have changed the soil conditions, passive soil gas data probably would not be acceptable. EBASCO stated that there was a major concern about forcing wells into an area that could effect sensitive studies. EBASCO pointed out that the former sump and 10s of feet of soil below the sump were removed when the building basement was constructed. JPL stated that all ways to collect the data would be reviewed.

EBASCO defined dry wells (cylindrical holes lined with either bricks or precast concrete with holes that act as seepage pits at the end of a system) for the RWQCB and the DTSC.

RWQCB asked if all drainage pipes were made of iron. EBASCO stated that, in most cases, cast iron pipes were used inside structures and vitrified clay was used outside structures.

EBASCO noted that, based on the historical review, there were no obvious large sources of possible contamination on site. The seepage pits were selected as potential sites because the potential existed that researchers had rinsed small quantities of chemicals down sinks that were designed for sanitary use only.

DTSC asked for the locations where engines that had been tested were washed down with solvent. EBASCO stated that the testing engines were hand-sized models. There was no hosing down of large engines with solvent taking place at this facility. DTSC requested purchasing records to show solvent use. EBASCO stated that purchasing records from the 1940's and 50's apparently do not exist.

RWQCB and EPA noted that a release notice authored by Don Lafontan in the JPL Facilities Division stated that the discovery of soils with high carbon tetrachloride content was in a dilution chamber. JPL and EBASCO stated that the release notice was in error. The carbon tetrachloride was located in an old storm drain.

JPL noted that the RWQCB request for descriptions, locations, and access problems for the seepage pits or dry wells that have been eliminated from further investigation based in inaccessibility will be provided in the historical document.

JPL told RWQCB that the remaining questions would be addressed in the Workplan and the Field Sampling and Analysis Plan.

JPL stated that no contaminants have been detected in the stormwater discharge monitoring to date. EBASCO noted that the stormwater system has only changed on a microscale. Most of the system is buried deep below the buildings. JPL stated that it is premature to approach a study of the stormdrain system at this time. RWQCB noted that the stormdrain system should at least be mentioned in the Workplan.

SOIL SAMPLING AND ANALYSIS

Response to the questions posed by the RWQCB under this heading were as follows:

1. JPL will do soil gas sampling instead of soil sampling for VOCs.
2. JPL agrees with this approach.
3. JPL agrees with this approach.

GROUNDWATER INVESTIGATIONS

Response to the questions posed by the RWQCB under this heading were as follows:

1. JPL will consider a well upgradient from MW-7.
2. JPL has observed large fluctuations in groundwater levels. Data should be available in the quarterly monitoring reports.
3. JPL will cover this item during well construction.
4. EBASCO noted that this was tried unsuccessfully. EBASCO stated that there is a very high percentage of fines.
5. JPL agrees with this suggestion.
6. JPL will utilize whatever technique is necessary to assure well water has stabilized before sampling.

SOIL GAS SURVEY

Response to the questions posed by the RWQCB under this heading were as follows:

1. JPL stated that this will be in the Sampling Plan.

2. JPL does plan to propose some vapor monitoring wells with discrete vertical sampling capability.
3. EBASCO stated that this method has been very unsuccessful in the past on this site. RWQCB notes that it is just a suggestion.

WORK PLAN PREPARATION

Response to the questions posed by the RWQCB under this heading were as follows:

1. i, ii, & iii - these are covered by the map provided by the map provided by Ebasco in today's meeting.
iv - JPL will provide these maps in the Workplan.
2. Whenever possible, JPL will provide dates for facilities maps.
3. JPL agreed to make this available in the Workplan.
4. Agreed.

EBASCO commented that pits were numbered in the order that they were found.

JPL asked EPA if public review was required after agency concurrence. EPA responded that nothing is required, not even formal concurrence.

EPA asked if copies of FFA had been sent to other agencies. EPA stated that NOAA does not want to be involved. JPL stated that they haven't heard from other groups on the FFA.

Actions:

JPL and EBASCO will provide corrections to the SI and PI with the workplan.

JPL and EBASCO will provide a description in narrative form that includes a short discussion of all activities at buildings on site, a description of how the buildings are plumbed together, and a discussion of which seepage pit the buildings are connected to. If available, specific engineering drawings will be referenced.

JPL will send the last monitoring report to RWQCB.

TOPIC: DOCUMENTS EXCHANGED

EPA gave JPL copies of two guidance documents, one for Administrative Records and one for Superfund Community Relations, a copy of a good example of a Community Relations Plan, and an example of meeting minutes that EPA, DTSC, and RWQCB all agree are good. A better example of a CRP will be mailed to JPL in a few weeks.

EBASCO turned over two copies of a facility map showing all sampling locations to date to RWQCB and DTSC. An additional copy will be made for EPA.

Discussion:

JPL noted that Fact Sheet # 2 is ready to go to press.

EPA explained that the Administrative Record is a formal record that contains specific major documents. It should contain any record used to come to a decision. The Information Repository will include the meeting minutes, however, EPA must approve the minutes before they are sent to the repository. JPL asked if an index was required for the Information Repository. EPA agreed to determine if an index was required.

EPA stressed the importance of good meeting minutes. JPL noted that they are currently exploring options for documenting minutes. JPL also agreed to pattern future meeting minutes after the example provided at this meeting by EPA. EPA suggests that it is very helpful for the RPM to review action items at the end of each meeting.

JPL requested agency comments on minutes from the last meeting. EPA is compiling comments and will send them as soon as possible. DTSC and RWQCB have not reviewed the minutes yet.

EPA noted that the agencies define "workplan" and "sampling and analysis plan" differently. For this project, the Workplan is a general document. There should be one Workplan which includes the historical summary for the project. The Historical Document would fall under Pg. 59 # 3. The Sampling and Analysis Plan will be more detailed than the Workplan. It is acceptable to add addendums to the FSAP in order to give details for the Operating Units. RWQCB and DTSC agree to one Workplan. EBASCO stated that, based on the inclusion of the historical summary in the workplan, they are very concerned with putting the workplan together for all three OUs by June 4. URS pointed out that the detailed rationale for boring locations is part of the FSAP in July. The site history is necessary for the workplan, but the pit by pit discussion could be in the source control section of the FSAP.

EBASCO said that RWQCB had sent an example of a QAPP, but that EPA has a different format. EPA stated that an agreement was worked out between EPA and RWQCB and that RWQCB format is acceptable.

EPA asked who the fact sheets are going to and said that this issue may need to be discussed with EPA's community relations expert.

EPA asked if Don Lafontan had turned over copies of all Superfund documents to EAO. JPL responded that they are still pulling documents now that EAO is the focal point for the project at the Laboratory. EAO is confident that they have approximately 99% of the documents.

Action:

EPA will check to see if an index is required for the Information Repository and get this information to JPL.

EPA, DTSC, and RWQCB will provide comments on the minutes from the previous meeting to JPL.

EPA will send JPL the name and phone number of their community relations expert.

JPL will send whatever form of closure report that is available for the storm drain where the carbon tetrachloride was found to the agencies.

EPA will send example copies of Table of Contents for FSAP and WP to JPL.

TOPIC: SCHEDULE COMMENTS

EPA stated that they do not require a schedule beyond the ROD, at this time. Section 8.3 of the FFA requires that, within 21 days of the issuance of ROD, further schedules will be determined.

EPA directed the following changes to the schedule:

- Replace the term FSAP with Workplan and Workplan with FSAP, based on the clarified definition of terms.
- The RWQCB request for validated data provided for interim review is an FFA requirement under Section 22. This should be furnished ASAP, but not later than 60 days after sampling.
- ROD schedule looks good, but should be taken to ROD finalization. EPA reviews the ROD for 60 days. There is concurrent public review. JPL has 60 days to finalize the ROD.
- Days means calendar days. Therefore, agency review times should be shortened to reflect this.
- Drop the "early start" and "early finish" terms in favor of "start" and "finish".
- Remove lab data validation dates. Only major publications go on the date list.

RWQCB confirmed that the OU designation and schedule is acceptable.

JPL stated that the schedule is workable, but very tight and proposed that all parties hold some type of meeting 45 days

into the review to get some advance notice of comments. EPA agreed to this.

Action:

JPL will make all changes discussed above and provide the schedule to EPA by Tuesday or Wednesday of next week.

MISCELLANEOUS TOPICS:

EPA noted that Charles Thomas from the City of Pasadena called to ask for an extension on the comment period for the FFA until March 23rd. EPA informed Thomas that the review period was already past, and although comments would still be appreciated, there was no avenue to address those comments. Thomas seemed to be satisfied that comments would be looked at, if submitted. Thomas asked how familiar the regulators were with the Devil's Gate Multi-use Project. EPA suggested that Thomas call a meeting to explain the project and specified that the regulators and JPL should be invited to the meeting.

RWQCB expressed a need for cross-sections. It was concluded that, because the site is high on an alluvial fan, close to a fault, and beset with difficult drilling conditions, it is unlikely that sufficiently detailed data could be obtained to do accurate cross-sections. However, data will be provided, if possible.

RWQCB has a guideline requiring soil samples for VOCs to be analyzed within 7 days.

JPL noted that the recent heavy rainfall flooded the Arroyo and wiped out the road to wells 1 and 9.

EBASCO stated that MW2 was checked in January, but was still dry.

EPA noted that the EPA inspection report is being held while waiting for more information from headquarters.

JPL asked if they need to respond to comments on the schedule that come in between March 5 and 25, 1993. EPA said not to respond.

EBASCO noted that some buildings have only one drawing remaining, therefore historical data is not available. JPL noted that best information available will be provided.

URS requested maps showing which buildings had been demolished. EPA requested information regarding building demolitions or replacements be placed in a table format.

Action:

EPA will set the schedule to the meeting with Charles Thomas to hear about the Devil's Gate Multi-use Project.

SUMMARY OF ACTION ITEMS

EBASCO will inform the group of the previous uses of Building 78.

EBASCO will inform the group of the previous uses of Building 183.

JPL and EBASCO will provide corrections to the SI and PI with the workplan.

JPL and EBASCO will provide a description in narrative form that includes a short discussion of all activities at buildings on site, a description of how the buildings are plumbed together, and a discussion of which seepage pit the buildings are connected to. If available, specific engineering drawings will be referenced.

Figures 4.1 and 4.3 will be provided in the Workplan.

JPL will send the last monitoring report to RWQCB.

JPL will reevaluate sampling around Building 302 and attempt to find a means to sample.

JPL will review the possibility of incorporating a complete historical compendium in the Workplan. The level of effort will be discussed with EBASCO.

EPA will check to see if an index is required for the Information Repository and get this information to JPL.

EPA, DTSC, and RWQCB will provide comments on the minutes from the previous meeting to JPL.

EPA will send JPL the name and phone number of their community relations expert.

JPL will send whatever form of closure report that is available for the storm drain where the carbon tetrachloride was found to the agencies.

EPA will send example copies of Table of Contents for FSAP and WP to JPL.

JPL will make all changes discussed above and provide the schedule to EPA by Tuesday, March 16.

EPA will set the schedule to the meeting with Charles Thomas to hear about the Devil's Gate Multi-use Project.

**NASA/Jet Propulsion Laboratory Remedial Project Managers Meeting
8 March 1993**

ATTENDEE LIST

<u>Name</u>	<u>Organization</u>	<u>Phone</u>
Charles L. Buriil	JPL	(818)354-0180
Judy Novelly	JPL	(818)354-8634
Dora Huff	NASA, Contracting Officer	(818)354-6315
Dan Melchior	Ebasco - Arlington, VA	(703)358-8911
Mark Cutler	Ebasco - Santa Ana, CA	(714)662-4056
Penny Nakashima	Cal/EPA DTSC	(818)567-3067
Bruce Ross	URS - Sacramento, CA	(916)929-2346
Michelle Schutz	U.S. EPA	(415)744-2396
Tizita Bekele	RWQCB	(213)266-7540
B. G. Randolph	Ebasco - Santa Ana, CA	(714)662-4141
Robert C. Pool	Caltech - General Council	(818)354-2159

NASA/JPL
AERIAL PHOTOGRAPHS

Location Identified from Photographs for Possible Investigation

1954	1964	1972	1992
North of Bldg 67, "Open Storage Area"			
South of Bldg 78, "Lagoons"			
South of Lagoons, Impoundments			
Near Bldg 114	Bldgs 156 & 125		
	Lagoon East of Bldg 150	Bldg 248	
		Flat area between Bldgs 148 & 197	
	Area North of Bldg 80	Bldg 148	
	Bldg 78	Parking	
	Bermed area north of B 183		
	South of B 168	Bldg 169	
			Flat area N of B248 and above road
			Flat area btw Bldgs 248 & 149
		Flat area behind Bldg North of B89	

Jan. 13, 1993

RECOMMENDATION

SOURCE IDENTIFICATION

The following areas of concern should be addressed during the RI:

1. 6 seepage pits are identified in the Preliminary Hydrogeologic Assessment report, Sept. 1984, by Richard C. Slade. The report states that during sampling, brick walls and metal pipe were discovered that might be indicative of the seepage pits. However, no samples were collected below the base of the walls. Therefore, these pits should be included in the RI.
2. 7 seepage pits and an area where waste solvent were damped, near Bldg. 187, are identified in the SI and the Supplemental Information To The ESI. Pit numbering used in the RI/FS is not the same as in these reports. It is not clear whether these pits are incorporated in the RI/FS; however, it is evident that some are not.
3. Description of dry wells should be given. These wells should be addressed as potential source areas as well as the alleged seepage pits by Building 87 and 88.
4. Descriptions, locations, and the problem with access should be given for the 9 seepage pits or dry wells that are said unaccessible for drilling and are discarded from further consideration.
5. The rationale for Boring #1, 2, 13, 19, 20 and 21 include discovery of solvent contamination either in a nearby seepage pit or a storm drain catch basin uncovered during construction works. Were these uncovered seepage pits identified and included in this RI? If so, which ones are they? Laboratory data and actions taken during the discovery of these pits are very important and should be provided.
6. Boring #22 is proposed by a building where radioactive materials were handled. Soil analysis from this borings should include analysis for radioactive.
7. Boring #16, one boring is not adequate to assess a wide potential area.
8. Boring #9 and #10 are proposed by Bldg. 90 while the rationale for these borings indicate solvents were

allegedly dumped into sumps at west of Bldg. 90 or east of Bldg. 88. Additional borings are needed by Bldg. 88 since these buildings are not close enough to be assessed with the proposed borings.

9. The two excavation areas should be identified and included in the RI.
10. Current chemical storage and used areas, clarifiers, catch basin, storm drains, etc. are potential sources and must be addressed.

SOIL SAMPLING AND ANALYSIS:

1. Drilling with air percussion for VOCs sampling is not acceptable because of its de-gassing effect.
2. Soil samples for metals should be collected at shallow depth instead of at 20 and 30 ft because of the high potential to find contamination with metals in the shallow zone.
3. Regional Board recommends analysis of soil samples for VOCs within seven days.

GROUNDWATER INVESTIGATION:

1. The up-gradient conditions of EMW-7 is as important as the down-gradient. Installation of up-gradient well(s) should be considered.
2. The large fluctuation of water level that calls for 50 ft screen should be justified with data.
3. Regional Board requires developing of a well after waiting 48 to 72 hours to allow curing of grouting material so that potential bridging could be avoided.
4. Wells should be developed until sampled water have no more than 10 ppm settleable solids or 5 nephelometric turbidity units (NTUs) as per EPA Technical Enforcement Guidance Document (TEGD).
5. Groundwater should be sampled after waiting a minimum of 5 to 7 days following development of the wells to ensure sample representativeness.
6. Purge three well volume or until pH, conductivity and temperature of the ground water stabilize prior to sampling.

SOIL GAS SURVEY:

1. Soil gas survey should be conducted at all potential and known source areas.
2. Based on shallow survey, multi-depth vapor well need to be installed to determine the vertical extent.
3. Hallow stem drilling can be used until refusal so that soil matrix samples will be collected during installation of vapor wells. Then, air percussion can be utilized to reach to the intended depths.

WORK PLAN PREPARATION:

1. Provide the following enlarged, approximately 3x3 ft. facility maps,
 - i. a facility map,
 - ii. a map showing potential source areas and monitoring wells,
 - iii. a map showing potential source areas and the proposed boring or soil gas survey point, and
 - iv. Figure 4-1 showing storm drainage and Figure 4-3 showing surface drainage at JPL are missing from the Supplemental Information to the ESI, and please provide them on the large scale map.
2. Given the on-going change at JPL, it is imperative to indicate date on all facility maps.
3. Provide a table presenting the corresponding current building numbers or features to the historical buildings or pits. The building number associated with the seepage pits are the old building numbers and some of the buildings are not found on the current map.
4. Maintain consistent pit numbers throughout the investigation.
5. Provide Closure reports for excavation where CTC contamination was uncovered.