

National Aeronautics and  
Space Administration  
Office of Program  
and Institutional Integration



**NASA Management Office**

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4800 Oak Grove Drive  
Pasadena, CA 91109-8099

Mr. Jonathan Bishop  
Executive Officer  
320 W. 4<sup>th</sup> Street, Suite 200  
Los Angeles, CA 90013

March 22, 2007

Dear Mr. Bishop,

Thank you for your letter of March 6, 2007, conveying the signed signature page for the Operable Unit (OU-1) Interim Record of Decision (IROD) for the NASA Jet Propulsion Laboratory (JPL). Your letter and the signature page are being added to the Administrative Record. We are already proceeding with the well installation and construction to bring the treatment plant up to full operating capacity.

The specific comments in your letter will be preserved in the administrative record, and I anticipate that the Federal Facilities Agreement (FFA) parties will thoroughly discuss the issues in your specific points during the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process leading to the final Record of Decision (ROD). The points in your letter do not serve to modify this existing IROD, or pre-determine conditions of the final IROD.

For clarification, the OU-1 IROD document sent to you on December 26, 2006 was not for review as stated in your letter. The document had already been through draft, draft final, and final review cycles in compliance with the CERCLA process and the FFA. Since the regulatory review process was complete, the document was formally presented to your agency on December 26, 2006 for signature.

In response to your specific item #1, I believe it is important to clarify the purpose and operation of this treatment system:

The key point highlighted during the CERCLA process and discussed again at the February 14, 2007 meeting with your staff, although not recorded in your letter, is that the primary purpose of the OU-1 remediation is source mass removal. The OU-1 treatment system was designed to achieve this goal.

As shown by the plot and attached tables in my letter to you dated February 16,

2007, the fluidized bed reactor (FBR) bioremediation treatment process employed at OU-1 is very successful at achieving substantial reductions between influent and effluent concentrations of perchlorate, on average. Data on influent and effluent concentrations are gathered to document source mass removal and the average substantial reduction in perchlorate by the system.

NASA has carefully operated the system and avoided upsets for over a year now; however because this is a biological system without redundant treatment, even the most careful operation cannot guarantee that the system will always achieve complete reduction of perchlorate. Notwithstanding best planning and diligent efforts, operational issues will occur at some point in the future that may result in incomplete removal of perchlorate before re-injection. Re-injection of cleaner water then serves to flush the source area containing higher levels of chemicals toward the extraction wells. Occasional operational issues that result in incomplete removal of perchlorate do not alter the overall success of the mass removal.

In response to your specific item #2:

It is also noteworthy that during my meeting with your staff on February 14, 2007, it was agreed that with the current levels being removed from the groundwater, it was appropriate to continue the treatment scheme memorialized in the OU-1 IROD. NASA does not agree, however, as stated in your letter that, "...in cases where effluent concentrations become asymptotic at levels exceeding ARARS or exceeding our substantive requirements, groundwater remediation shall be continued..."

However, in light of your concern surrounding the ultimate aquifer cleanup, I understand that the FFA parties will thoroughly discuss this issue as we progress toward the final ROD.

In response to your specific item #3:

It should be clarified that although the proposed well spacing is designed to capture groundwater within the source area (i.e., minimize leakage between the extraction wells), the primary objective of the system is mass removal. Operational decisions, including extraction well flow rates, will be made to maximize mass removal. The current extent of the chemical plume is approximately one mile from the source area, and additional treatment systems are located, or will be located, at the leading edge and in the mid-plume area. Therefore, mass removal in the source area is much more important to NASA's cleanup approach than containment.

I would like to re-iterate my appreciation for the cooperative partnership we have among the CERCLA FFA parties which will be instrumental as we work towards a final integrated ROD for aquifer restoration.

Sincerely,

Steve Slaten  
NASA Remedial Project Manager

cc: Mohammad Zaidi, Remedial Program Manager, RWQCB  
Mark Ripperda, Remedial Program Manager, U.S. EPA  
Michel Iskarous, Remedial Program Manager, California DTSC  
Sayareh Amirebrahimi, California DTSC  
Robert Hayward, Lincoln Avenue Water Company  
Keith Fields, Battelle  
Gary Takara, City of Pasadena  
Alan Sorsher, California DHS  
Kurt Souza, California DHS



# California Regional Water Quality Control Board

## Los Angeles Region



Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

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Agency Secretary

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Governor

March 6, 2007

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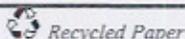
**APPROVAL OF INTERIM RECORD OF DECISION OPERABLE UNIT 1, NASA JET PROPULSION LABORATORIES (JPL) FACILITY, 4800 OAKGROVE DRIVE, PASADENA, CALIFORNIA, FILE NO. 117.0001, (SITE IDENTIFICATION NO. 2040600)**

Dear Mr. Slaten:

You had submitted Final Interim Record of Decision (IROD) for Jet Propulsion Laboratories (JPL) Facility Operable Unit 1 (OU-1) to the Regional Board on December 26, 2006 for our review, and also requested Regional Board Executive Officer to sign off on the signature page. In order to discuss and clarify a few questions arising from our review of the IROD, Regional Board staff had a meeting on February 14, 2007 with you, Mr. Mark Ripperda of USEPA, and Mr. Michel Iskarous of DTSC. A summary of discussion related to the IROD issues is presented as follows:

1. Regional Board staff required a clarification from JPL affirming compliance with applicable relevant and appropriate requirements (ARARs) and our substantive requirements (California Department of Health Services maximum contaminant levels and notification levels) so that the groundwater extracted and treated by the OU-1 remedy during implementation of IROD meets these requirements before re-injection into the OU-1 source area. JPL presented a few plots of the influent and treated groundwater data in the meeting to demonstrate the effectiveness of the current fluidized bed reactor (FBR) system in substantially reducing the perchlorate contamination in the groundwater extracted from OU-1. In the meeting, Regional Board staff requested JPL to also submit the remediation progress reports containing laboratory analytical results of the influent and treated groundwater samples collected from April 2005 through August 2006 from OU-1 for our review of the FBR system effectiveness. Our review of the reports indicates that a total 7 out of 69 treated groundwater samples collected and analyzed during the above period exceeded the

*California Environmental Protection Agency*



*Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.*

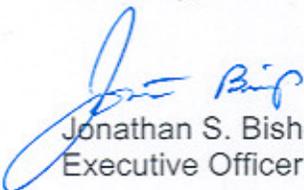
perchlorate notification level of 6 microgram per liter  $\mu\text{g/L}$ . The 7 exceedances occurred between April 1 2005 and February 28, 2006, and ranged from 103 to 610  $\mu\text{g/L}$  of perchlorate, but no exceedance has occurred after February 2006. Regional Board staff understands that a few exceedances in the effluent concentration due to optimization and stabilization of a bioremediation system such as FBR during the first few months can be expected and are hard to avoid. Other than for the 7 exceedances, the perchlorate concentration in the treated groundwater samples collected from the FBR have not exceeded the required notification level and remained below 2  $\mu\text{g/L}$ . Based on review of these post-February 2006 data, Regional Board staff considers JPL in compliance with our substantive requirements for groundwater cleanup before re-injection under the IROD and expects such continued compliance during the next approximately three years after which compliance with the ARARs and State substantive requirements under the future Final Record of Decision for OU-1 will start.

2. During the February 17 meeting, Regional Board staff requested an assurance from JPL that in cases where effluent concentrations become asymptotic at levels exceeding ARARs or exceeding our substantive requirements, groundwater remediation shall be continued until the asymptotic levels are reduced to the required cleanup goals before re-injection. You agreed with our request and provided your verbal assurance.
3. Regional Board staff also brought up the requirement of placing the proposed and future extraction wells at a spacing that shall minimize leakage of contaminated groundwater from the OU-1 source area between any two adjacent wells.

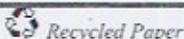
With the understanding that JPL agrees with the above summary of our discussions during the February 14, 2007 meeting, and shall continue to comply with our above requirements during the implementation of the IROD, Regional Board approves the IROD, and I have signed and attached the requested page with this letter.

Should you have any questions regarding this letter, please contact the project manager Mr. Mohammad Zaidi at (213) 576-6732, or Dr. Kwangil Lee at (213) 576-6734.

Sincerely,

  
Jonathan S. Bishop  
Executive Officer

*California Environmental Protection Agency*



Mr. Steve Slaten  
NASA-JPL

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March 6, 2007

Attachment: Signature page.

cc: Ms.Sayareh Amirebrahimi, California Department of Toxic Substances Control,  
Glendale  
Mr. Michel Iskarous, California Department of Toxic Substances Control,  
Glendale  
Mr. Kurt Souza, California Department of Health Services  
Mr. Alan Sorsher, California Department of Health Services  
Mr. Mark Ripperda, U. S. Environmental Protection Agency, Region IX  
Mr. Robert Hayward, Raymond Basin Management Board  
Mr. Keith A. Fields, Battelle, 505 King Avenue, Columbus, Ohio 43201-2693  
Mr. Gary Takara, City of Pasadena

***California Environmental Protection Agency***



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FOR THE STATE OF CALIFORNIA:



Jonathan Bishop, Executive Officer  
California Regional Water Quality Control Board  
Los Angeles Region

3/7/07

Date