

MEMORANDUM

TO: Benito Garcia, HRMB Bureau Chief

FROM: ^{TD} Teri Davis, RCRA Technical Compliance Program

THROUGH: ^{AK} Ronald A. Kern, Technical Compliance Program Manager
Barbara Hoditschek, Permitting Program Manager

DATE: November 16, 1994

SUBJECT: Los Alamos National Laboratory (LANL) Site-Wide Hydrogeologic Regulatory Requirements

The Canyons Operable Unit (OU) RFI Workplans, which are currently being developed at LANL, do not address fundamental site-wide hydrogeologic requirements adequately. EPA appears to be scheduling these Workplans without ensuring that the hydrogeologic requirements in the HSWA Permit are being met. Fundamental environmental setting questions remain which need to be answered prior to design of ground-water monitoring systems. Basic geology, hydrogeology, and pathways for contaminant transport have not been adequately addressed to date (see AIP's review of LANL's 1993 IWP memo, Steve Alexander, February 22, 1994, Teri Davis to Steve Alexander memo, November 23, 1993 on LANL's Site-Wide Hydrogeologic Requirements, and RCRA's review of LANL's Ground Water Business Plan, Ronald Kern, July 7, 1994).

The Canyon OUs are the place to address most of the hydrogeologic questions/requirements in the Permit if the requirements are acknowledged by DOE/LANL and EPA. Completion and submittal of NMED's hydrogeologic evaluation and recommendations to the EPA (FY 95 Work Grant commitment) will occur after the development of several Canyon OU RFI Workplans. It appears that EPA is not coordinating with NMED's review of LANL's hydrogeologic requirements.

The Canyons OU RFI Workplan is to be divided into multiple workplans for each canyon. The first Canyons OU RFI workplan scheduled for delivery to EPA is Los Alamos Canyon in May 1995. The first draft is due December 16, 1994. It is of concern at this time that the alluvial and perched aquifer systems will not be adequately addressed to meet the requirements under the Permit, and the basic hydrogeologic questions remaining will not be addressed if the site-wide requirements under HSWA are not considered, understood, and integrated into individual workplans. Integrating the objectives of a site-wide characterization, such as the need to delineate aquifer extent, determine directions of ground-water flow, and aquifer characteristics, with the site-specific investigations is essential.



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A comprehensive regional and facility specific site-wide hydrogeologic characterization is required of LANL by Module VIII of RCRA Operating Permit (Section P, Task III: Facility Investigation, A. Environmental Setting, 1. Hydrogeology). As previously noted by NMED's HRMB Technical Compliance Program, (Task III of Section P) Module VIII is not being adequately addressed.

At present, the following fundamental hydrogeologic issues/questions remain unresolved at LANL:

- o Individual zones of saturation beneath LANL have not been adequately delineated, and the hydrologic connection between these is not understood. As required in the HSWA Permit, a facility-wide description of the hydrogeologic characteristics affecting ground-water flow beneath the facility can not be made without delineation of the perched-intermediate aquifer(s) beneath LANL.
- o The recharge area(s) for the main and perched-intermediate aquifers have not been identified. It is unknown at this time if any significant quantity of water is recharging the main aquifer through the fracture-fault zones which exist on the Pajarito Plateau. Characterization of these site-wide fault zones with respect to potential pathways for aqueous migration is not complete. It is unknown what effect, if any, these zones may have on the direction of ground-water flow and hydraulic gradient of the main and perched-intermediate aquifers.
- o The direction of main aquifer and perched-intermediate ground-water flow as influenced by pumping of production wells is unknown.
- o Aquifer characteristics can not be determined without additional monitoring wells installed within specific intervals of the various aquifers beneath the facility. It is unknown what the locations of wells designed for aquifer testing should be without the first bullet being answered.

DOE Order 5400.1 (General Environmental Protection Program), Chapter IV, Section 5.b, p.9, states that a groundwater monitoring plan shall be developed as a specific element of the Environmental Monitoring Plan and the Groundwater Protection Management Program (GWPMP). In Chapter III, Section 4.a, p.2, it is stated that the GWPMP may use in whole or in part those technical documents, plans, and permits associated with compliance with SDWA, RCRA, and CERCLA which satisfy this requirement. *Problems associated with using DOE 5400.1 as a driver for a site-wide hydrogeologic characterization of this facility include: 1) lack of discernible funding, 2) lack of a compliance schedule, and 3) current non-compliance with HSWA hydrogeologic requirements with no foreseeable clear plan as to how the HSWA requirements will be met.*

The requirements under HSWA Module VIII (Task III) are not adequately addressed in the most current Ground Water Business Plan, a plan developed through the GWPMP. *LANL's 1993 GWPMP plan and 1994 Ground Water Business Plan lack fundamental data quality objectives and performance standards (e.g. criteria for well locations).* In the past LANL has stated that the requirements under HSWA are being met by ongoing programs. HRMB does not consider that these individual programs are adequately addressing these requirements.

At the August 24, 1994 meeting between NMED and DOE/LANL, DOE/LANL stated that the criteria for monitoring well locations are based on the need to: 1) have a spatial distribution of wells across the facility, and 2) be sited downgradient from regulatory units. *The above criteria, however, do not consider the hydrogeologic system.* It is also unclear how monitoring well locations can be adequately sited prior to consideration of available data. Time is not being spent on the rationale of these well locations before conducting work outlined in the draft phased ground water monitoring plan. The phased approach is necessary to identify data needs and gaps. The approach currently being taken is the reverse of that required for a logical progression.

The efforts of the Environmental Restoration Program at LANL have consistently been "cart before the horse". Sampling plans for phase I assessment of release determination from SWMUs have been developed prior to an adequate environmental setting characterization. HRMB is not recommending an excessive, but rather a reasonably focused investigation.

The hydrogeologic requirements in the HSWA permit (Task III) are not being met. The GWPMP has no clear plan to address these requirements, and the funding seems uncertain. To further complicate the situation, other workplans have addressed canyon issues - *fragmenting even more the intentions of a hydrogeologic site-wide characterization.* Currently, no comprehensive program has been developed to address these requirements. The hydrogeologic projects underway lack integration in order to meet the specific requirements of the Permit and to address the fundamental hydrogeologic issues mentioned above. The lack of knowledge surrounding these fundamental hydrogeologic issues does not allow for compliance with the regulatory requirements of a site-wide hydrogeologic characterization.

It is recommended that bi-weekly conference calls be held between EPA and NMED to discuss concerns NMED has with specific hydrogeologic requirements of the Permit. This communication will enhance coordination between NMED's efforts on the hydrogeologic evaluation and the work currently being conducted under the ER program.

It is further recommended that a HSWA driven Site-Wide Hydrogeologic Workplan be developed in the immediate future to address the Permit requirements and fundamental hydrogeologic questions remaining at LANL. *It is unclear if EPA is also considering this approach, or is perhaps waiting for the State's recommendation until such an order is issued, or has not considered this approach, or is not planning to consider this approach. These are*

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issues that EPA and the State need to discuss and reach an immediate accord. Once a site-wide hydrogeologic characterization workplan has been completed then the Canyons OU RFIs can incorporate the work needed. For those Canyon RFIs already developed, an addendum to the Workplans could be submitted at that time. This approach should assure that site-wide concerns have been integrated into the individual RFI workplans.

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