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NATIONAL LABORATORY

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Date: December 2, 1999
In Reply Refer To: ESH-18/WQ&H:99-0460
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HSWA LANL 6/M/HWP/99

John Keiling
Hazardous and Radioactive Waste Bureau
New Mexico Environment Department
2044 Galisteo St., Building A
P.O. Box 26110
Santa Fe, New Mexico 87505

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SUBJECT: CONTAMINANT RESPONSE CRITERIA

Dear Mr. Keiling:

This letter is to summarize the October 29th discussion with John Young, HRMB regarding the Los Alamos National Laboratory's Groundwater Integration Team (GIT) proposed response when groundwater contamination is detected during implementation of Hydrogeologic Workplan activities. The primary focus of the GIT response is prioritizing the timing of further action based on a qualitative estimate of the risk associated with the detection. The evaluation and prioritization is proposed to be performed jointly between the GIT and HRMB.

In addition to what was presented during our discussion in Santa Fe, I have attached a decision flow diagram that provides more detail of the steps that will be taken to respond to detection of groundwater contamination. I would like to invite you and your staff to work with a sub-committee of the GIT to test out this decision flow on two wells where contamination has been detected during drilling (R-9 and R-25) on December 10, 1999 at 9:00 in the ESH-18 Conference Room (TA-59, Building 116). By working through this decision process together, I hope that we can become familiar with the process, develop consistency in applying the process, and find improvements that should be made.

The decision flow process is shown graphically on the figure included with this letter. It begins with the receipt of validated analytical data from a water sample collected from a borehole or well. This applies to screening samples collected during drilling as well as to samples collected as part of the sampling program specified in the Hydrogeologic Workplan. If one or more constituents appear to be above background, a more thorough evaluation is warranted to confirm the reliability of the data. This would involve review of available information such as the analytical data packages, field notes, and submittal of additional samples for verification. Once the reliability of the data is confirmed, the measured concentration will be compared to water quality standards (e.g. Maximum Concentration Limits) where applicable or other regulatory limits (e.g. health advisory concentrations). This process will occur for any constituent, regardless of which NMED Bureau may have responsibility to regulate that constituent. (This decision flow does not intend to attribute regulatory authority to particular administrative organizations within NMED.)

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If the measured concentration of one or more constituent is above a regulatory limit, actions will occur on two simultaneous paths. The first path is intended to assure the public that the water supply is safe. This path involves reviewing the analytical results from the nearest water supply wells. If the constituent(s) of interest have been analyzed for within the last year in the nearest water supply well, these results will be used in the review. If the constituent(s) of concern have not been analyzed for in the last year, the nearest water supply wells will be sampled and the samples will be analyzed for those constituents. The review will be similar to that described for the original water sample, the analytical measurements will be compared to background. Those that appear to be above background will be further evaluated to confirm the reliability of the result. The results deemed to be reliable will be compared to standards or to other regulatory limits, where standards do not exist. If constituents are present in a water supply well above a standard or regulatory limit, the NMED, water utility, and other stakeholders will be formally notified. Although the information regarding sampling and analytical results will continue to be shared on an ad hoc basis, for the purposes of this document, "notification" refers to formal notification via a letter. Necessary corrective measures will be implemented, such as taking the subject water supply well off-line. In this scenario, the Department of Energy and the Laboratory would commit to immediately planning and implementing a plume definition program, developing remedial alternatives, and selecting and implementing a remedy.

The second path from the discovery of one or more constituents in groundwater above a standard or regulatory limit first requires the notification of NMED and other stakeholders of the presence of contaminants above a level of regulatory concern. The next steps are intended to gather as much available data to scope the problem. Data from adjacent non-producing wells will be compiled or collected if not current. A conceptual model of the plume will be developed based on the existing data including potential sources, flow direction, flow rate, known extent, contaminant mobility, etc. The plume conceptual model will be the basis for prioritizing the response to the discovery of contamination.

Fifteen "Contaminant Response Criteria" are proposed for establishing the priority of response (Table 1). The first nine criteria are directed at determining the threat to human health. These nine criteria are presented in the order in which they would have to be evaluated in order to assess the risk to human health. The remaining six criteria are focused on logistical and administrative concerns. These last six criteria will only be considered if the first nine criteria indicate low potential for human health impact. The suggested process for applying the criteria to make a prioritization decision is a joint LANL Groundwater Integration Team (GIT) Contamination Response Subcommittee and NMED meeting to evaluate each criterion for the plume in question. The consensus decision will be to prioritize the plume as "High", "Moderate", or "Low".

Plumes of "High" priority will have current fiscal year funds applied to them. With these funds, a plume characterization plan will be developed and characterization will begin within six months of the notification of NMED and stakeholders. Plumes of "Moderate" priority will be the subject of a funding request in the next fiscal year budget. Thus, moderate priority plumes will have a plume characterization plan in place and implementation begun within one year of notification to stakeholders. Funding to address "Low" priority plumes will be placed in the five-year budget planning cycle and will be addressed in a three- to five-year timeframe.

We look forward to working with HRMB in testing this proposed prioritization process on December 10, 1999. Please fee free to contact me at 665-4681 should you have any questions regarding this letter.

Sincerely,

Charles L. Nylander

Charles L. Nylander
Water Quality and Hydrology Group

CN/em

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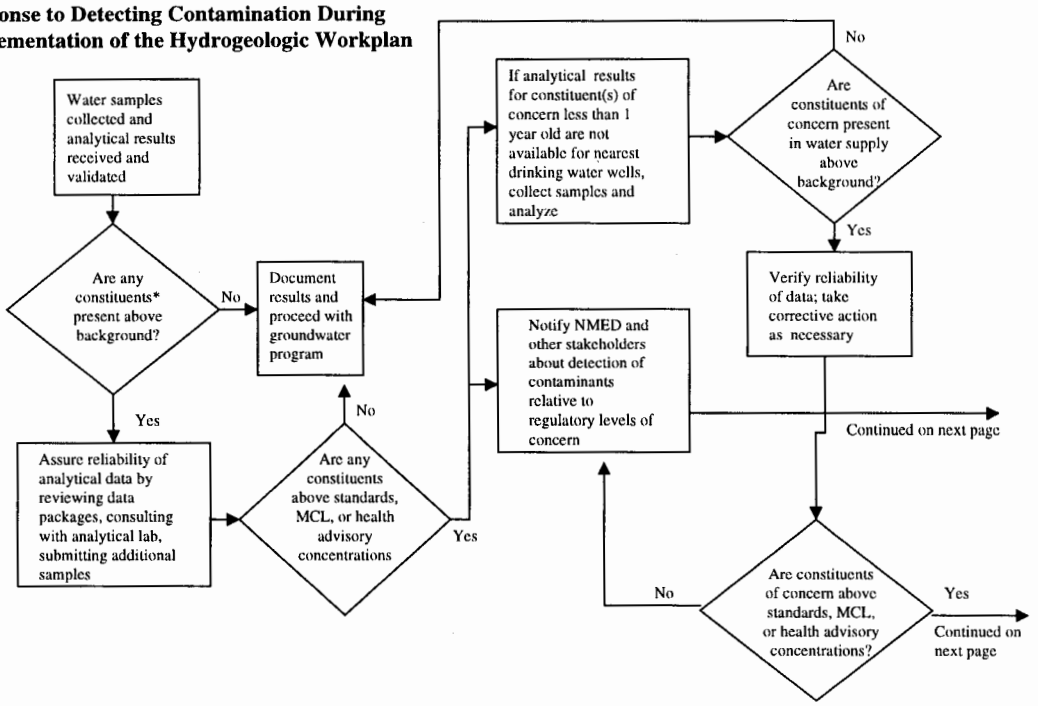
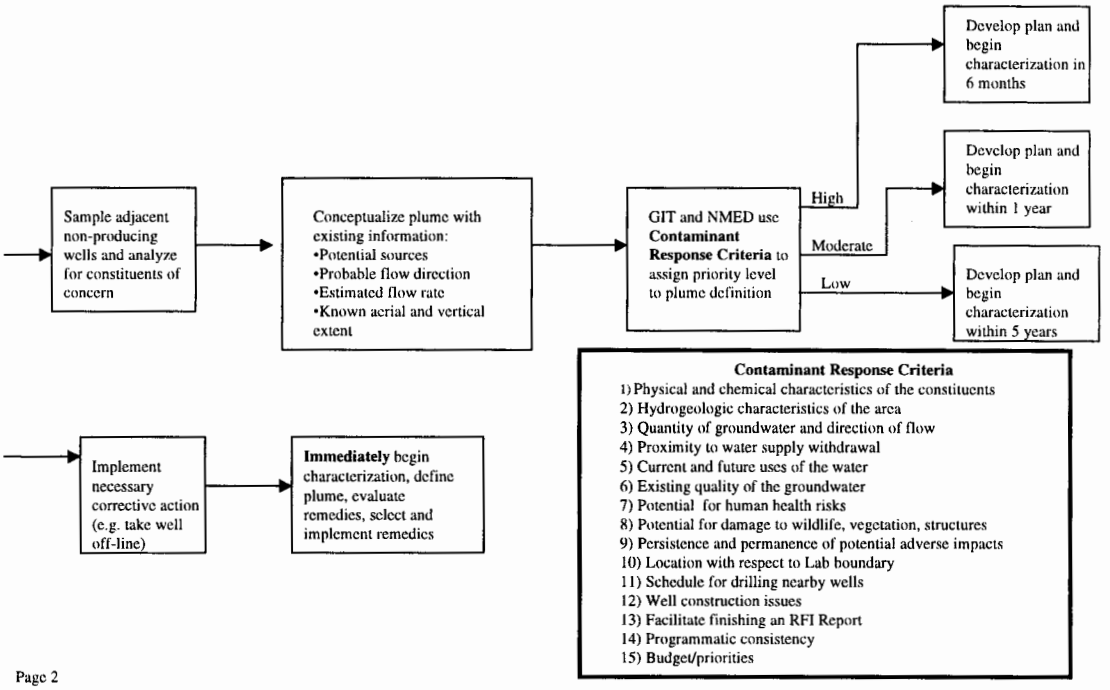
S. Rae, ESH-18, w/enc., MS K497
K. Mullen, ESH-18, w/enc., MS K497
WQ&H File, w/enc., MS K497
CIC-10, w/enc., MS A150

Table 1: Contaminant Response Criteria	
Number	**Criteria**
1	Physical and chemical characteristics of the constituent(s)
2	Hydrogeologic characteristics of the immediate area
3	Quantity of groundwater and direction of groundwater flow
4	Proximity and withdrawal rates of water-supply wells
5	Current and future uses of the water
6	Existing quality of the groundwater, including other sources of contamination and their cumulative impact on the ground-water quality
7	Potential for health risks caused by human exposure to the constituent(s) of concern
8	Potential to damage wildlife, vegetation or physical structures caused by exposure to the constituents
9	Persistence and permanence of adverse impacts from exposure to the constituents
10	Location with respect to the Lab boundary
11	Well construction issues (intermediate perched zones require special construction
12	Schedule for drilling nearby wells
13	Facilitate finishing an RFI Report
14	Programmatic consistency
15	Budget/Priorities

Response to Detecting Contamination During Implementation of the Hydrogeologic Workplan



* Various constituents fall within the jurisdiction of different divisions within the NMED. This diagram intends to address all constituents without ascribing jurisdiction for their regulation.

Response to Detecting Contamination During Implementation of the Hydrogeologic Workplan (cont.)