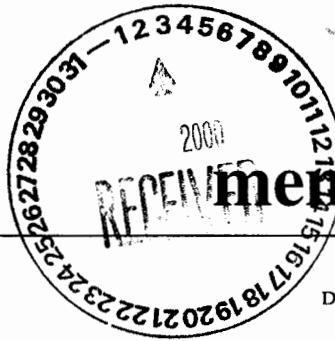


# Los Alamos

Los Alamos National Laboratory  
Los Alamos, New Mexico 87545



## Memorandum

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SYMBOL: ESH-18/WQ&H:00-0315  
SUBJECT: **ACTION PLAN FOR THE EXTERNAL ADVISORY GROUP SEMI-ANNUAL REPORT  
DATED JUNE 26, 2000**

DATE: September 26, 2000

MAIL STOP/TELEPHONE: K497/5-4681

Enclosed is the Action Plan addressing comments and recommendations given by the External Advisory Group in their Semi-Annual Report dated June 26, 2000.

This document is being sent to you because you have received a copy of the Laboratory's Hydrogeologic Workplan and a binder for the Annual Reports and meeting minutes, or you have requested to be on the distribution list. If you are not interested in continuing to receive these materials, please contact me at the address or telephone number listed above, or by email at [nylander@lanl.gov](mailto:nylander@lanl.gov).

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September 26, 2000

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**Los Alamos National Laboratory  
Groundwater Integration Team**

**Action Plan**

**for**

**External Advisory Group  
March 2000 Recommendations**

**September 20, 2000**

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## INTRODUCTION

This Action Plan addresses the recommendations in the External Advisory Group's (EAG) fourth semi-annual report, "Semi-Annual Report to the Groundwater Integration Team of the Los Alamos National Laboratory by the External Advisory Group", dated June 26, 2000. The EAG was established in October 1998 to provide a periodic external assessment of Los Alamos National Laboratory's (LANL or Laboratory) Hydrogeologic Characterization Program and the implementation of proposed characterization activities.

This is the fourth Action Plan written to address the current EAG recommendations. Recommendations from the previous EAG semi-annual reports dated November 1998, July 1999, and December 1999 are included in Appendix A.

## EAG JUNE 2000 RECOMMENDATIONS AND GIT PROPOSED ACTIONS

The following section provides a description of each EAG recommendation paraphrased from the June 2000 Semi-Annual Report, and the LANL Groundwater Integration Team (GIT) proposed action for addressing the recommendation. Each recommendation is provided a "tracking" number that includes the month and year of the EAG report from which it was taken. A summary table of each of the recommendations and proposed actions is provided (Table 1). The summary table also provides a crosswalk to previous EAG recommendations (November 1998, July 1999, and December 1999 Semi-Annual Reports) that are similar.

### MANAGEMENT AND GLOBAL ISSUES – Program Management

***Recommendation 7-00-1: Continue ongoing communications to refine Workplan end product(s) with representatives from LANL, DOE, and NMED with EAG participation not mandatory.***

The EAG noted the positive atmosphere of problem solving of Senior Management in establishing goals and objectives with all representatives. Continued meetings will be required to further refine Workplan end products, and EAG participation will not be necessary at all meetings. Senior Management may delegate working-session tasks to other management and technical personnel as appropriate.

#### ***Proposed Action 7-00-1***

The GIT appreciates the efforts of the EAG to bring consensus among the managers regarding the end-state of the hydrogeologic characterization program. The GIT will continue to schedule manager meetings with the EAG during the EAG semi-annual reviews. The GIT encourages the EAG to reiterate the importance of the management consensus at these sessions.

### MANAGEMENT AND GLOBAL ISSUES – Data Quality Objectives

***Recommendation 7-00-2: A presentation at the next EAG meeting to clarify details of the Hydrogeologic Workplan as it relates to the Environmental Restoration (ER) QA framework.***

The ER Quality Program Overview presentation clarified personnel, processes, and implementation involved in the ER program. However, more detail is necessary to better understand the relationship between the Hydrologic Workplan and the ER QA framework. It is not clear whether the QA systems and processes previously developed for ER programs are applicable to the Workplan and the Data Quality Objectives.

***Proposed Action 7-00-2***

A presentation on the adoption of the ER Quality Assurance framework by the hydrogeologic characterization program has been scheduled for the October 2000 Quarterly/EAG Semi-Annual meeting.

***Recommendation 7-00-3: Continue assessment of DQO needs of the Workplan and applicability to ER QA and SOP processes.***

The EAG has previously stated concern that DQOs, or like processes, be developed and applied to well completion and development, sample collection and handling, data validation, database development, and model development processes. Further understanding and development of DQO needs in these processes and the applicability of the ER SOPs are relevant to obtaining Workplan goals.

***Proposed Action 7-00-3***

The ER Project Groundwater Investigation Focus Area has committed to reviewing existing SOPs by October 2000 and updating and/or preparing necessary SOPs by January 2001. This will be described in a presentation at the October Quarterly/EAG Semi-Annual meeting.

***Recommendation 7-00-4: Expeditious evaluation of ER SOPs relevant to ongoing and future Workplan processes.***

As the Workplan implementation is in progress and wells are currently being completed, the evaluation of ER SOPs is urgent. SOP evaluation for Workplan elements already in progress (well construction, coring, logging, completion, development, etc.) should be priority and SOP evaluation for the later-stage processes (sampling) should follow.

***Proposed Action 7-00-4***

The ER Project Groundwater Investigation Focus Area has committed to reviewing existing SOPs by October 2000 and updating and/or preparing necessary SOPs by January 2001. This will be described in a presentation at the October Quarterly/EAG Semi-Annual meeting.

***Recommendation 7-00-5: Analytical services to be provided by a vendor external to LANL until LANL laboratory services can prove quality data generation.***

There is concern about the quality of certain data being generated by internal Laboratory lab. <sup>90</sup>Sr sample values are noted as inaccurate due to unlikely detection in both samples and blanks. Sample splits sent to laboratories external to LANL resulted in no detections. There is indication of poor results for other analytes, particularly Americium, as well. This makes all data generated for the Workplan suspect. The use of a vendor external to LANL is necessary until it can be proven that the LANL lab can generate data of adequate performance and quality standards.



***Proposed Action 7-00-5***

The GIT appreciates the concern about analytical data quality. Please note that samples collected by the ER Project are analyzed by outside vendors, as are all of the samples for the hydrogeologic characterization program. Thus, the strontium analyses that are the focus of the comment do not affect the data collected for the hydrogeologic characterization program. However, the LANL environmental surveillance program was affected by the unacceptable quality of the strontium analyses and is now using outside analytical laboratories.

**MANAGEMENT AND GLOBAL ISSUES – Administrative*****Recommendation 7-00-6: Facilitate note taking with immediate laptop storage.***

As a result of increasing meeting content, comments, and questions, the EAG requests that laptop capabilities be available for note taking during the meetings. This will facilitate accurate note taking and rapid production and dissemination of the notes.

***Proposed Action 7-00-6***

The GIT agrees that the lag in distributing meeting minutes has been unacceptably long. After consideration of various alternatives, the October Quarterly/EAG Semi-Annual meeting minutes will be limited to summaries of conclusions, significant discussions, and action items. It is hoped that limiting the scope of the minutes will facilitate the turn around time and distribution.

***Recommendation 7-00-7: Addition of a management close-out session to the regularly scheduled GIT management meeting.***

As suggested by the ESH Division Director, the EAG would like to see implemented a closeout session for managers. This would be scheduled during the regularly scheduled managers' meeting and might involve more technical discussions.

***Proposed Action 7-00-7***

A debriefing for the managers by the EAG has been scheduled for the October Quarterly/Semi-Annual EAG meeting.

**TECHNICAL ISSUES – Data Gathering*****Recommendation 7-00-8: Formalize the GIT Subcommittees' decision process resulting in Workplan wells Field Implementation Plans (FIP) to include increased documentation of rationale and approach.***

The GIT interacts with its subcommittees to assess data needs and data quality requirements for planned wells prior to drilling. This process aids in well-informed decision-making. The EAG has not participated in the GIT subcommittee meetings and understands that the process is

informal, usually a verbal consensus that is then carried out by drillers via the FIP. Formalization of this process through documentation could be valuable to the Workplan. Documentation could ameliorate potential future concerns of regulators and stakeholders should questions arise about drilling decisions.

***Proposed Action 7-00-8***

The GIT concurs with the need to document discussions and rationale that lead to decisions that impact the program. The hydrogeologic characterization program will adopt the documentation requirements of the ER Project QA program.

***Recommendation 7-00-9: External review of aquifer test data analysis and interpretation for the modeling program.***

The EAG would like the opportunity to review analysis of hydraulic performance tests to evaluate accuracy and reliability of interpretation of aquifer property estimates important to the success of the modeling program.

***Proposed Action 7-00-9***

Separate reports on hydrologic testing are being prepared. The EAG will be asked to provide comments on the draft reports.

***Recommendation 7-00-10: Consider enhanced aquifer screening in some wells for modeling purposes and consider thorough testing and analysis of existing municipal production wells.***

Currently, sparse hydraulic data have been obtained because of limited screened areas in newly completed monitoring wells to support modeling activities; therefore, it is difficult to determine if hydraulic parameters are appropriately representative of average conditions. This approach may not be adequate in identifying aquifer properties for modeling. It is suggested that existing municipal wells on the Pajarito Plateau could also serve as sources of hydraulic information.

***Proposed Action 7-00-10***

Longer screens for testing in some places might be appropriate depending on specific needs. Longer screens will make sampling at a particular interval less conclusive. Municipal supply wells were tested when constructed. Further work on the production wells is a matter of opportunity as they are used for water supply. Some of the new R wells will be located near municipal supply wells in order to provide further information on hydrologic properties. It will be hard to achieve a static water level near some of the wells for hydrologic testing.

**TECHNICAL ISSUES - Database**

***Recommendation 7-00-11: Continue the Water Quality Database (WQDB) per schedule or exceed scheduled development.***

The data collected under the auspices of the Hydrogeologic Workplan are being incorporated into an institution-wide comprehensive Water Quality Database (WQDB). The EAG considers

the WQDB to be an important product of the Workplan in that it integrates Workplan data with existing and future data from ground water monitoring activities, and it serves as a repository for modeling efforts. It is important for WQDB development tasks to remain on schedule or, if possible, to exceed the currently published schedule.

***Proposed Action 7-00-11***

The WQDB has made significant progress toward making all data accessible. The aftermath of Cerro Grande fire slowed progress on the well-related modules, but accelerated the process of making runoff data available on the web. The schedule for the WQDB will be presented at the October Quarterly/EAG Semi-Annual meeting.

***Recommendation 7-00-12: The Well Construction module of the WQDB should contain all drilling aspects of the wells.***

Due to changes in drilling methods in the R wells, it is important that the Well Construction module capture all information regarding these changes as well as changes made during single-well drilling and depths and stratigraphy at which the changes were implemented.

***Proposed Action 7-00-12***

The design of the well construction module of the WQDB does account for a tremendous amount of detailed data collection related to drilling activities. Ability to capture drilling techniques, fluids in the hole, drilling depths, and much more are included in the database design. Dave Broxton and Bill Stone participated in the design process in order to ensure completeness. Additionally, each module is extensively reviewed prior to finalization to ensure items are not left out.

***Recommendation 7-00-13: Include external data to the WQDB only if the data conforms to specific collection SOPs and methodologies, and either flag or do not include older data that do not conform.***

To maintain WQDB data integrity, the GIT is working to standardize methods by which Workplan data are collected. This is being done through standardizing the SOPs. Therefore, it is important that new external data being collected for the WQDB use the same standardized methods with verification of such.

Older data which do not meet the standardized data collection methods should either not be included in the WQDB or be flagged to indicate standardized methods not used.

***Proposed Action 7-00-13***

The WQDB team has made efforts to allow data from external sources to be incorporated in the database through the use of identifiers related to the data's source, and to the SOPs/collection methods that were used. This allows consumers of the data to review and separate, if necessary, one data set from another to avoid comparing "apples to oranges". The identifiers include:

- SOURCE ORG - sample values included but are not limited to: ESH18-Hydrology, ESH18-Stormwater, ER, NMED, etc.
- VINTAGE - sample values are planned to include SOP codes, codes indicating possible shortcomings in the SOP/data collection method, etc. Vintage codes are maintained in a separate table for consistency, and each vintage code is associated with a text description that explains the code in detail.

Ultimately, it is the decision of data stewards whether to incorporate external data into the WQDB at all; but these identifiers should make the decision to do so less risky.

***Recommendation 7-00-14: Include the GIS/map interface in the WQDB.***

It is requested that development of the GIS/map interface in the WQDB be completed ahead of schedule. This functionality will increase Internet usability and stakeholder understanding of the WQDB data.

***Proposed Action 7-00-14***

The GIT and WQDB teams agree that GIS capabilities are important to the usability of the database. We are actively working to identify and obtain the additional resources necessary to support the development of these capabilities.

***Recommendation 7-00-15: Utilize WQDB beta testers external to the Laboratory.***

Beta testers for the WQDB have been requested. In addition to a NMED representative, it is recommended that at least one beta tester from the Pueblos, CAB, and the EAG be used.

***Proposed Action 7-00-15***

There have been some difficulties arranging for system beta testing because of the LANL firewall. Modules of the system are becoming available for access to the public in late September 2000. This will allow for greater ease of beta testing by NMED, the Pueblos, CAB, and EAG. In addition, the WQDB team is willing to organize periodic on-site testing sessions for representatives of these organizations.

**TECHNICAL ISSUES - Modeling**

***Recommendation 7-00-16: Provide EAG with information regarding planned modeling activities to include activity schedules and descriptions.***

The EAG recommends additional information prior to each meeting. For EAG input and recommendation to be more effectively directed toward planned activities, rather than evaluation of end products, the EAG will require a schedule of planned modeling activities and a description of tasks used to guide site characterization, risk assessment, and remediation decisions.

***Proposed Action 7-00-16***

A revision to the Hydrogeologic Workplan has been drafted that provides a schedule for the planned modeling activities and describes how the modeling is used in decision-making. This

revision to the Hydrogeologic Workplan will be presented at the October Quarterly/EAG Semi-Annual meeting.

***Recommendation 7-00-17: Afford EAG additional time with modeling staff to discuss technical modeling issues.***

It is difficult to evaluate the appropriateness, effectiveness, adequacy, and efficiency of modeling studies and results during the brief summaries presented at the semi-annual meetings or in the Annual Reports. The EAG requests and additional time to spend with the GIT modeling team to discuss technical modeling issues. A technical working session could be scheduled in conjunction with an already scheduled meeting at which the EAG is in attendance.

***Proposed Action 7-00-17***

To provide more detail, written reports will be distributed to some or all members of the EAG when the documents are approved for distribution. Additionally, an evening session to discuss modeling has been added to the agenda for the October Quarterly/EAG Semi-Annual Meeting.

***Recommendation 7-00-18: Provide the EAG with a copy of the draft Hydrologic Workplan.***

Providing the EAG with a copy of the Modeling Workplan would facilitate Recommendations 7-00-16 and 7-00-17.

***Proposed Action 7-00-18***

The modeling workplan is a revision to Section 4 of Hydrogeologic Workplan. This will be presented at the October Quarterly/EAG Semi-Annual meeting.

***Recommendation 7-00-19: Continue to enhance the hydrologic modeling in respect to geologic and geochemical modeling, well installations and site characterization, deep well monitoring, and risk assessment.***

The EAG notes the progress in the GIT hydrologic modeling. The EAG recommends continued efforts to further define the link between the hydrologic model and the program areas of geologic modeling, geochemical modeling, risk assessment, and database development. It is also suggested that the intended use of modeling in the siting and prioritization of deep monitoring wells be better defined and discussed in future modeling and well drilling presentations.

***Proposed Action 7-00-19***

Progress is occurring in this area – at the October Quarterly/EAG Semi-Annual meeting with the EAG, we will provide a “hands-on” session to demonstrate this and to clarify the links between the modeling and the databases. The demonstration will walk through the integration of R-Well data collection, spatial data analysis, geologic modeling and hydrologic and geochemical modeling. The newly formed Risk-Based Decisions Subcommittee of the GIT will handle the definition and description of the relationship of DQOs for data and models in the context of a risk end-point.

***Recommendation 7-00-20: Continue to build on the DQO process for hydrologic modeling that was established in the Hydrologic Workplan.***

Continued refinement of the hydrologic modeling DQO process is recommended to a) allow decisions to evolve from technical questions to well placement or remedial response decision, b) clarify where modeling results will be used to make decisions and, c) define acceptable levels of uncertainty in modeling result that would support a valid decision. Appendix 4 of the HWP provides a good initial template for applying the DQO process to hydrologic modeling, but will require refinement and redefinition as modeling progresses. DQOs should be revisited at the beginning of each new modeling project or task. The process should address, to the extent possible, where modeling results will be relied on in reaching decisions.

***Proposed Action 7-00-20***

The newly formed GIT Risk-Based Decisions Subcommittee will address much of this recommendation. The ER Project has recently initiated a dialog with the NMED regarding confidence intervals and the use of probabilistic contaminant fate and transport models to support risk-based corrective-action decisions. The Chairperson of the Risk-Based Decisions Subcommittee is a participant in those discussions, which will provide a basis of similar discussions in the context of the regional aquifer.

***Recommendation 7-00-21: Provide EAG with additional technical information regarding modeling methodologies and results.***

The EAG would like to review modeling methodologies and results to provide the GIT with comments regarding approach and results. To do so, adequate technical information should be included with review materials to enable an appropriate review.

***Proposed Action 7-00-21***

The ER Project requires reports on models developed under ER direction and sponsorship. The sponsor (Diana Hollis) sees great value in peer review by the EAG and will pursue funding avenues to support the EAG in this activity.

***Recommendation 7-00-22: Provide GoldSim/FEHM comparison modeling information to EAG.***

The GoldSim computer program is being used to perform probabilistic groundwater transport calculations to evaluate potential contaminate migration impacts to groundwater at Area G. A report will be prepared describing the results of a comparison of GoldSim and FEHM process-level models and a demonstration of GoldSim to MDA G. The EAG was not provided with sufficient information about GoldSim or the analysis being performed to support any comments regarding the appropriateness and success of this approach. The EAG requests more information regarding current and planned GoldSim analyses for the purpose of reviewing the results of the comparison to FEHM process model and evaluating the acceptability of the tradeoff for the purposes for which GoldSim is to be applied.

***Proposed Action 7-00-22***

The ER Project is funding much of the GoldSim application development, and will be pleased to provide the EAG with FEHM/GoldSim comparisons to date. In FY 2001, the

ER Project will be developing GoldSim applications for particular corrective-action remedies for the MDAs. The sponsor of the ER Project GoldSim applications (Diana Hollis) can provide reports and plans to the EAG and would welcome feedback. This can be done provided a source of funding for the EAG to provide such support is available.

***Recommendation 7-00-23: Reconsider the feasibility of planned studies to simulate TA-50 water injection test with discrete fracture and dual permeability models.***

Recently, a water injection test and moisture monitoring were simulated using FEHM. The simulation was performed using an effective continuum model without fractures. Results indicate that this conceptual and numerical model is adequate to explain test data. The GIT is considering whether or not modeling using discrete fracture and dual permeability might fit the data. The EAG proposes that the effective continuum conceptual model yields significant benefits in that there is less calculated risk and less costly characterization and approach.

***Proposed Action 7-00-23***

The TA-50 injection test model was identified and sponsored by the ER Project to validate the FEHM model. The sponsor (Diana Hollis) appreciates and concurs with the EAG comment/recommendation and has not included additional calculations in Work Packages with EES-5 for Fiscal Year 2001. Any new modeling concerning the TA-50 tracer test will be limited in scope and designed to bolster the conclusions already obtained.

***Recommendation 7-00-24: Continue with planned testing and monitoring activities at TA-49.***

The EAG views the modeling efforts at TA-49 a success and recommends verification of model results against planned field testing and long-term moisture monitoring

***Proposed Action 7-00-24***

The GIT Modeling Subcommittee appreciates the recognition of the work at TA-49. The ER Project directed the TA-49 groundwater flow and contaminant transport modeling explicitly to support decisions regarding the Voluntary Corrective Measure (VCM) (replacing asphalt cap with evapotranspirative cap) at that site and regarding the need for and objectives of *in situ* moisture monitoring at TA-49 as part of the VCM. The ER Project will continue to report to the GIT (and the EAG, if requested) on the effectiveness of the VCM at reducing *in situ* moisture at that site, to the extent that such information provides insight into the hydrology of specific (disturbed) portions of the Pajarito Plateau.

***Recommendation 7-00-25: Continue to refine regional aquifer model for receptor and risk analysis performance capabilities.***

The regional aquifer model is successfully being used to address migration issues of site-related chemicals to potential receptors. This model application is primarily for conceptual model testing and development. However, one of the key uses of the model will be to examine potential risk scenarios such as the presence of high explosive in the regional aquifer. The EAG concurs with the GIT recommendation to continue addressing the hydrologic properties of the regional aquifer to better support future analyses.

***Proposed Action 7-00-25***

The GIT in general and the ER Project in particular concurs with this recommendation, and will evaluate the applicability of commercial probabilistic groundwater pathway analysis tools (e.g., GoldSim and GroundwaterFX) to aide in the development of a useful risk-based decision-support tool for the regional aquifer.

***Recommendation 7-00-26: Develop a concise summary geochemical report in lay terms.***

Significant progress has been made in geochemical modeling in the last year with respect to geochemical data collection, conceptual model development, and speciation programs application to geochemical modeling scenarios. Because of the amount and complexity of information, the presentation at the meeting did not allow time to address the relationship to other Workplan components. Therefore, the EAG requests the Geochemistry Subcommittee to prepare a summary report that discusses the information in lay terms and includes information such as project status, future directions, information needed and what it means, how information will be used, and how it ties to the Workplan products.

***Proposed Action 7-00-26***

The newly formed GIT Risk-Based Decisions Subcommittee will consider this recommendation. The Chairperson of that subcommittee (Diana Hollis) assesses this recommendation as the need for DQOs for geochemical analysis and modeling activities. The DQOs should be based on how information is needed to support high-confidence decisions regarding long-term risk associated with contaminants found in groundwater that are, or may, become accessible to human and/or ecological receptors.

**TECHNICAL ISSUES – Drilling and Well Completions*****Recommendation 7-00-27: Require longer pipe lengths for well drilling and completion and require an 8.75 percent open area in the base pipe.***

The EAG recommends future purchase orders for pipes should state pipe lengths of 10 and 20 feet and 8.75 percent open area in the base pipes.

***Proposed Action 7-00-27***

The GIT concurs with the recommendation for longer pipe lengths and required open area in the base pipe. The recommendation will be incorporated as purchase orders for pipes are issued.

***Recommendation 7-00-28: Obtain NMED approval for installation of longer filter pack intervals in R wells.***

The configuration of filter pack installed in deep monitoring wells could lead to well failures due to settling of fine sands. The EAG suggests that approval be obtained from the NMED to install longer filter packs in R wells.



**Proposed Action 7-00-28**

The GIT concurs that these are issues that require discussion and resolution. The October Quarterly/EAG Semi-Annual meeting will include a presentation and discussion of the status of the RCRA/HSWA permit and well construction issues, including screen length, filter pack, and well annulus.

**TECHNICAL ISSUES – Groundwater Monitoring*****Recommendation 7-00-29: Present current and planned groundwater sampling methodologies at the next EAG.***

The GIT's approach to groundwater monitoring for completed wells was not addressed at the meeting. The EAG is concerned that there is a lack of understanding of how various factors involved in constructing wells through the sampling process can impact sample quality. Errors in groundwater sampling will be propagated through the WQDB, modeling, and risk assessment. The EAG is requesting a presentation dedicated to current and planned groundwater-sampling methodologies at the next meeting.

**Proposed Action 7-00-29**

At the October Quarterly/Semi-Annual GIT meeting, there will be a presentation on the progress thus far in developing SOPs. At the Annual Meeting in March 2001, there will be a complete presentation of completed SOPs. A progress summary is planned for the October meeting.

***Recommendation 7-00-30: Research current methods, including the NMED low-flow sampling protocol, of groundwater sampling and develop sampling SOPs for Westbay systems and single-screen installation R wells.***

The EAG recognizes that groundwater samples have been collected using protocols established years ago. There have been improvements in sample collection techniques over the past decade that include low-flow, semi-passive, or passive approaches to collecting groundwater which offer many advantages. LANL is urged to develop sampling SOPs for the Westbay systems and single-screen installation R wells. LANL should review the NMED low-flow sampling protocol currently being developed by NMED.

**Proposed Action 7-00-30**

Current methods of groundwater sampling are being incorporated into SOPs currently under development.

***Recommendation 7-00-31: The effects of newly-utilized synthetic drilling fluids on sample quality following well completion are largely unknown. Therefore, the EAG would caution the GIT, NMED, and other stakeholders that gradual changes in monitored parameters, including potential contaminants, might be observed in the R wells for some number of sampling events after well completion.***

The EAG agrees that wells drilled with synthetic drilling fluids will be better for collecting groundwater samples than those drilled with bentonite. However, little is known about the impact of synthetic drilling fluids on the quality of the sample. Past discussion regarding site

drilled with bentonite noted that several quarterly sampling results were required before a geochemical background level was detected. The EAG recommends caution in the use of initial sample results where synthetic-drilling fluids are being used. It is difficult to estimate the time necessary for expected geochemical background levels to be obtained.

***Proposed Action 7-00-31***

The GIT has recognized the potential for drilling fluids to interfere with the groundwater chemistry. To quantify the potential effects, chemistry studies have been done on the drilling fluids. Results indicate that EZ mud increases total organic carbon. The amount of increased total organic carbon decreases as the well is developed. The presence of organic carbon could affect HE monitoring through enhanced degradation. It is also documented that development decreases the amount of drilling fluid present in the water. Documenting these types of drilling fluid effects is one step toward interpreting the sampling results that will be obtained from the quarterly sampling.

***Recommendation 7-00-32: Use air rotary casing advance drilling methods, without fluids other than water, for Los Alamos and Mortandad Canyon wells.***

The EAG recommends the use of air rotary casing advance drilling methods without fluid other than water, in Los Alamos and Mortandad Canyon wells.

***Proposed Action 7-00-32***

The GIT shares the concern regarding the addition of drilling fluids in areas where contamination is expected. The possibility of drilling without drilling fluids will be evaluated for each well, weighing the benefits of water chemistry against the cost and schedule risks of "dry" drilling.

***Recommendation 7-00-33: Review the significance of colloidal transport of contaminants in sample collection and modeling.***

The colloidal transport of contaminants may be underestimated according to various research groups. Under certain conditions, colloids have been shown to travel well through porous material. As disruptive sampling procedures and sample handling can affect colloidal materials in groundwater, the EAG recommends that the signification of colloidal transport of contaminants be reviewed.

***Proposed Action 7-00-33***

The Geochemistry Subcommittee concurs with EAG concerns about accelerated transport of contaminants by colloids. The subcommittee will continue to review information regarding colloidal transport of contaminants and to closely evaluate water quality data to assess the occurrence of colloidal transport within the hydrogeologic system of the Pajarito Plateau.

## **TECHNICAL ISSUES – Risk Based Assessment**

### ***Recommendation 7-00-34: Develop risk assessments plan specific to the Hydrological Workplan and identify risk assessment staff.***

Identification of contaminants during Hydrological Workplan implementation requires a different approach to risk assessment than that of the ER program. A risk assessment plan specific to the Hydrological Workplan needs to be developed to include approaches that are different from the ER program risk assessment requirements. Responsible staff and a response process should be in place before a need for action is required.

#### ***Proposed Action 7-00-34***

The GIT has formed a Risk-Based Decisions Subcommittee, chaired by Diana Hollis. Members of the Risk-Based Decisions Subcommittee include the GIT Chairman (Charlie Nylander); Chairpersons of the Hydrology (David Rogers), Well Construction, Geochemistry (Pat Longmire) and Modeling (Bruce Robinson) Subcommittee; a human-health and ecological risk assessor (Richard Mirenda, Ph.D.); a decision analyst (Tara Athan, Ph.D.); and a member of the NMED DOE Oversight Bureau (TBD).

This subcommittee will

- identify risk-based decision analysis methods applicable to the objectives of the Hydrogeologic Workplan,
- communicate the utility of these methods to develop DQOs for tasks and activities pursuant to the objectives of the Hydrogeologic Workplan, and
- assist the GIT in implementing these methods consistently and appropriately.

In addition, the Risk-Based Decisions Subcommittee will develop input to the Hydrogeologic Workplan that describes how risk-based decision-analysis methods will be used to develop and revise DQOs for well siting and prioritization; geologic, hydrologic and geochemical data; groundwater monitoring well locations; and potential groundwater corrective actions (including monitored natural attenuation).

### ***Recommendation 7-00-35: Provide risk assessment approaches to be employed if contaminants noted during well drilling for EAG review, and provide time during EAG meetings for EAG and risk assessment staff discussion.***

The EAG would like to review the Hydrological Workplan risk assessment approach and have time to meet with risk assessment staff for discussion.

#### ***Proposed Action 7-00-35***

The Chair of the Risk-Based Decision Subcommittee will provide the GIT and the EAG with periodic updates of progress made by the subcommittee. The progress reports will focus on discussions, decisions and possible roadblocks and/or resistance regarding the application of risk-based decision analysis methods to GIT activities and tasks. Additionally, the Risk-Based Decisions Subcommittee welcomes an opportunity to meet with the EAG to review and improve risk assessment approaches and methods, and will work with the PM (Charlie Nylander) to ensure that sufficient time is available for productive meetings.

***Recommendation 7-00-36: Develop a risk-based response plan to be implemented if data in exceedance of established standards is released to the public and stakeholders.***

A response plan needs to be developed to address issues involved if data exceeds established standards. The plan should address the risk issues and how they differ from the ER program, staff responsible for risk assessment, and the use of risk assessment in making decisions and communicating with regulators and stakeholders.

***Proposed Action 7-00-36***

The Risk-Based Decision Subcommittee will review and revise, as necessary, the draft response-to-contamination decisions framework proposed by the GIT to the NMED. The decision framework will identify decision criteria such as exceedances of MCLs at accessible locations. Once the draft decision framework is determined to be complete by the subcommittee, it will be provided to the EAG for review and comment.

***Recommendation 7-00-37: Develop list of MCLs, or other guideline, for potential chemicals of concern.***

To determine if contaminants are considered a significant risk, target levels of contamination need to be identified. For most contaminants, existing MCLs can be used. For contaminants without MCL, other guidance levels need to be identified.

***Proposed Action 7-00-37***

The risk assessor of the Risk-Based Decisions Subcommittee will ensure that such a list is available, either as a stand-alone document or as a list of readily-accessible references.

***Recommendation 7-00-38: Risk assessment process for subpopulation groups is to be flexible and iterative.***

The risk assessment process needs to address local and site related issues of affected subpopulation groups.

***Proposed Action 7-00-38***

The risk-assessor member of the Risk-Based Decisions Subcommittee of the GIT is actively involved in the ER Project's integrated risk assessment team, which includes members of the neighboring Indian Pueblos. As such, the subcommittee will be aware of current and emergent discussions regarding risk assessment scenarios. Non-standard receptors and/or exposure scenarios that are determined to be reasonable and appropriate for contamination identified in groundwater will be included in risk assessments for the groundwater pathway, when such risk assessments are deemed necessary to support a decision. Those situations will be identified in the decision framework discussed in Response Action 4.

To better ensure that the spectrum of stakeholder concerns is ultimately addressed in critical risk assessments regarding groundwater contamination, it is also planned that, ultimately, the mathematical models used to calculate risk associated with groundwater contamination will be generally available to stakeholders via a web site. Stakeholders will be able to vary model

assumptions and parameters to evaluate risks to various receptors under multiple exposure pathways. The use of probabilistic contaminant transport and fate models will be especially valuable for such applications.

Table 1 provides a summary of the July 2000 EAG recommendations and the Laboratory's proposed actions. This table also provides a crosswalk to previous EAG recommendations (November 1998 and December 1999 Semi-Annual Report) that are similar.

**TABLE 1.**  
**EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
7-00-1	Continue ongoing communications to refine Workplan end product(s) with representatives from LANL, DOE, and NMED with EAG participation not mandatory.	The GIT will continue to schedule manager meetings with the EAG during the EAG semi-annual reviews. The GIT encourages the EAG to reiterate the importance of the management consensus at these sessions.	No impacts. This is a continuation of previously established activities.
7-00-2	A presentation at the next EAG meeting to clarify details of the Hydrogeologic Workplan as it relates to the Environmental Restoration (ER) QA framework.	A presentation on the adoption of the ER Quality Assurance framework by the hydrogeologic characterization program has been scheduled for the October 2000 Quarterly/EAG Semi-Annual meeting.	The addition of a more rigorous QA program to the Hydrogeologic Workplan activities is expected to have a low to moderate impact on funding and low impact on schedule.
7-00-3	Continue assessment of DQO needs of the Workplan and applicability to ER QA and SOP processes.	The ER Project Groundwater Investigation Focus Area has committed to reviewing existing SOPs by October 2000 and updating and/or preparing necessary SOPs by January 2001.	Included as part of 7-00-2.
7-00-4	Expedition evaluation of ER SOPs relevant to ongoing and future Workplan processes.	The ER Project Groundwater Investigation Focus Area has committed to reviewing existing SOPs by October 2000 and updating and/or preparing necessary SOPs by January 2001.	Included as part of 7-00-2
7-00-5	Analytical services to be provided by a vendor external to LANL until LANL laboratory services can prove quality data generation.	LANL environmental surveillance program is now using outside analytical laboratories.	No impact on the Hydrogeologic Characterization Program.
7-00-6	Facilitate note taking with immediate laptop storage.	Meeting minutes will be limited to summaries of conclusions, significant discussions, and action items. It is hoped that limiting the scope of the minutes will facilitate turn around time and distribution.	This will have a small positive impact by reducing the resources required to develop meeting minutes.
7-00-7	Addition of a management closeout session to the regularly scheduled GIT management meeting.	A debriefing for managers by the EAG has been scheduled for the October 2000 Quarterly/Semi-Annual EAG meeting.	No impact as a Manager's session is regularly scheduled in conjunction with the EAG Semi-Annual meetings.

**TABLE 1.**  
**EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

<b>Number</b>	<b>Recommendation</b>	<b>Action</b>	<b>Estimate of Schedule and Funding Impacts from Recommendation</b>
7-00-8	Formalize the GIT Subcommittees' decision process resulting in Workplan wells Field Implementation Plans (FIP) to include increased documentation of rationale and approach.	The hydrogeologic characterization program will adopt the documentation requirements of the ER Project QA program.	Included in 7-00-2.
7-00-9	External review of aquifer test data analysis and interpretation for the modeling program.	Separate reports on hydrologic testing are being prepared. EAG will be asked to provide comments on the draft reports.	Low impact. Funding impacts associated with EAG time to review documents. No schedule impact as the EAG review will be held concurrent with internal LANL review.
7-00-10	Consider enhanced aquifer screening in some wells for modeling purposes and consider thorough testing and analysis of existing municipal production wells.	Municipal supply wells were tested when constructed. Further work on the production wells is a matter of opportunity as they are used for water supply. Some of the new R wells will be located near municipal supply wells in order to provide further information on hydrologic properties. It will be hard to achieve a static water level near some of the wells for hydrologic testing.	Low funding impact for testing of water production wells as the opportunity arises. no schedule impact as these activities would occur simultaneously with ongoing activities.
7-00-11	Continue the Water Quality Database (WQDB) per schedule or exceed scheduled development.	The WQDB has made significant progress toward making all data accessible. Accelerated the process of making runoff data available on the web. The schedule for the WQDB will be presented at the October Quarterly/EAG Semi-Annual meeting.	Low to moderate funding impacts would result in accelerating the WQDB schedule. Additional staff resources would be required.
7-00-12	The Well Construction module of the WQDB should contain all drilling aspects of the wells.	Ability to capture drilling techniques, fluids in the hole, drilling depths, and much more are included in the database design. D. Broxton and B. Stone participated in the design process in order to ensure completeness. Each module is extensively reviewed prior to finalization to ensure items are not left out.	No impact. Recommendation has been implemented.

**TABLE 1.**  
**EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

<b>Number</b>	<b>Recommendation</b>	<b>Action</b>	<b>Estimate of Schedule and Funding Impacts from Recommendation</b>
7-00-13	Include external data to the WQDB only if the data conforms to specific collection SOPs and methodologies, and either flag or do not include older data that do not conform.	Data from external sources to be incorporated in the database through the use of identifiers related to the data's source and to the SOPs/collection methods that were used. Ultimately, it is the decision of data stewards whether to incorporate external data into the WQDB at all; but these identifiers should make the decision to do so less risky.	No impact. Recommendation has been implemented.
7-00-14	Include the GIS/map interface in the WQDB.	Actively working to identify and obtain additional resources necessary to support the development of GIS/map interface in WQDB.	Low to moderate funding impact.
7-00-15	Utilize WQDB beta testers external to the Laboratory.	Difficulties arranging for system beta testing because of the LANL firewall. Modules of the system are becoming available for access to the public in late September 2000, which will allow ease of beta testing by NMED, the Pueblos, CAB, and EAG. In addition, the WQDB team is willing to organize periodic on-site testing sessions for representatives of these organizations.	No impact. Recommendation has been implemented.
7-00-16	Provide EAG with information regarding planned modeling activities to include activity schedules and descriptions.	A revision to the Hydrogeologic Workplan has been drafted that provides a schedule for the planned modeling activities and describes how modeling is used in decision-making. To be presented at the October meeting.	No impact to funding or schedule.
7-00-17	Afford EAG additional time with modeling staff to discuss technical modeling issues.	To provide more detail, written reports will be distributed to some or all members of the EAG when the documents are approved for distribution. Additionally, an evening session to discuss modeling has been added to the agenda for the October Quarterly/EAG Semi-Annual Meeting.	No impact to funding or schedule.
7-00-18	Provide the EAG with a copy of the draft Hydrologic Workplan.	The modeling workplan is a revision to Section 4 of Hydrogeologic Workplan and will be presented at the October Quarterly/EAG Semi-Annual meeting.	No impact to funding or schedule.



**TABLE 1.**  
**EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

<b>Number</b>	<b>Recommendation</b>	<b>Action</b>	<b>Estimate of Schedule and Funding Impacts from Recommendation</b>
7-00-19	Continue to enhance the hydrologic modeling in respect to geologic and geochemical modeling, well installations and site characterization, deep well monitoring, and risk assessment.	A "hands-on" session to demonstrate and clarify the links between the modeling and the databases will be conducted at the October Quarterly/EAG Semi-Annual meeting. Demonstrated will be the integration of R-Well data collection, spatial data analysis, geologic modeling and hydrologic and geochemical modeling. The GIT Risk-Based Decisions Subcommittee will handle the definition and description of the relationship of DQOs for data and models in the context of a risk end-point.	No impact to funding or schedule as modeling remains an important part to the hydrogeologic characterization program.
7-00-20	Continue to build on the DQO process for hydrologic modeling that was established in the Hydrologic Workplan.	The GIT Risk-Based Decisions Subcommittee will address much of this recommendation. The ER Project has initiated a dialog with NMED regarding confidence intervals and the use of probabilistic contaminant fate and transport models to support risk-based corrective-action decisions.	Cost and schedule impacts included in 7-00-2.
7-00-21	Provide EAG with additional technical information regarding modeling methodologies and results.	The ER Project sees great value in peer review by the EAG and will pursue funding avenues to support the EAG in this activity.	Low funding impact for increase participation of the EAG. No schedule impacts because reviews can be held concurrently.
7-00-22	Provide GoldSim/FEHM comparison modeling information to EAG.	The ER Project will be pleased to provide EAG with FEHM/GoldSim comparisons to date. In FY 2001, the ER Project will be developing GoldSim applications for particular corrective-action remedies for the MDAs.	No impact on schedule or funding.
7-00-23	Reconsider the feasibility of planned studies to simulate TA-50 water injection test with discrete fracture and dual permeability models.	Additional calculations have not been included in Work Packages with EES-5 for Fiscal Year 2001. Any new modeling concerning the TA-50 tracer test will be limited in scope and designed to bolster the conclusions already obtained.	No impact; recommendation implemented.

**TABLE 1.**  
**EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

<b>Number</b>	<b>Recommendation</b>	<b>Action</b>	<b>Estimate of Schedule and Funding Impacts from Recommendation</b>
7-00-24	Continue with planned testing and monitoring activities at TA-49.	The ER Project will continue to report to the GIT (and the EAG, if requested) on the effectiveness of the VCM at reducing in situ moisture at that site, to the extent that such information provides insight into the hydrology of specific (disturbed) portions of the Pajarito Plateau.	No impact; recommendation implemented.
7-00-25	Continue to refine regional aquifer model for receptor and risk analysis performance capabilities.	The GIT and the ER Project will evaluate the applicability of commercial probabilistic groundwater pathway analysis tools (e.g., GoldSim and GroundwaterFX) to aide in the development of a useful risk-based decision-support tool for the regional aquifer.	No impact; recommendation implemented.
7-00-26	Develop a concise summary geochemical report in lay terms.	The GIT Risk-Based Decisions Subcommittee will consider this recommendation. The subcommittee chairperson assesses this recommendation as the need for DQOs for geochemical analysis and modeling activities.	Low impact on funding and schedule to develop a geochemistry report geared for the lay person.
7-00-27	Require longer pipe lengths for well drilling and completion and require an 8.75 percent open area in the base pipe.	The recommendation will be incorporated as purchase orders for pipes are issued.	No impact on schedule or funding.
7-00-28	Obtain NMED approval for installation of longer filter pack intervals in R wells.	The October Quarterly/EAG Semi-Annual meeting will include a presentation and discussion of the status of the RCRA/HSWA permit and well construction issues, including screen length, filter pack, and well annulus.	No impact on schedule or funding.
7-00-29	Present current and planned groundwater sampling methodologies at the next EAG.	The October Quarterly/Semi-Annual GIT meeting will include a presentation on the progress thus far in developing SOPs. At the March 2001 Annual Meeting, there will be a complete presentation of completed SOPs.	Cost and schedule impacts included in 7-00-2.

**TABLE 1.**  
**EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

<b>Number</b>	<b>Recommendation</b>	<b>Action</b>	<b>Estimate of Schedule and Funding Impacts from Recommendation</b>
7-00-30	Research current methods, including the NMED low-flow sampling protocol, of groundwater sampling and develop sampling SOPs for Westbay systems and single-screen installation R wells.	Current methods of groundwater sampling are being incorporated into SOPs currently under development.	Cost and schedule impacts included in 7-00-2.
7-00-31	The effects of newly utilized synthetic drilling fluids on sample quality following well completion are largely unknown. Therefore, the EAG would caution the GIT, NMED, and other stakeholders that gradual changes in monitored parameters, including potential contaminants, might be observed in the R wells for some number of sampling events after well completion.	Chemistry studies have been done to quantify potential effects of interference of drilling fluids. Documenting the affect of the various types of drilling fluid effects is one step toward interpreting the sampling results that will be obtained from the quarterly sampling.	Low funding impact from chemistry studies completed in FY00. No schedule impacts.
7-00-32	Use air rotary casing advance drilling methods, without fluids other than water, for Los Alamos and Mortandad Canyon wells.	The possibility of drilling without drilling fluids will be evaluated for each well, weighing the benefits of water chemistry against the cost and schedule risks of "dry" drilling.	Potentially high schedule and funding impacts from "dry" drilling.
7-00-33	Review the significance of colloidal transport of contaminants in sample collection and modeling.	The subcommittee will continue to review information regarding colloidal transport of contaminants and to closely evaluate water quality data to assess the occurrence of colloidal transport within the hydrogeologic system of the Pajarito Plateau.	Potentially high funding impacts from chemistry studies required to quantify colloidal transport of contaminants.
7-00-34	Develop risk assessments plan specific to the Hydrological Workplan and identify risk assessment staff.	The GIT Risk-Based Decisions Subcommittee will identify risk-based decision analysis methods applicable to the objectives of the Hydrogeologic Workplan, communicate the utility of these methods to develop DQOs for tasks and activities pursuant to the objectives of the Hydrogeologic Workplan, and assist the GIT in implementing these methods consistently and appropriately.	Low funding impacts associated with additional GIT subcommittee work.

**TABLE 1.**  
**EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

<b>Number</b>	<b>Recommendation</b>	<b>Action</b>	<b>Estimate of Schedule and Funding Impacts from Recommendation</b>
7-00-35	Provide risk assessment approaches to be employed if contaminants noted during well drilling for EAG review, and provide time during EAG meetings for EAG and risk assessment staff discussion.	The GIT Risk-Based Decision Subcommittee will provide the GIT and EAG with periodic updates of progress made by the subcommittee, which will focus on discussions, decisions and possible roadblocks and/or resistance regarding the application of risk-based decision analysis methods to GIT activities and tasks.	Cost and schedule impacts included in 7-00-34.
7-00-36	Develop a risk-based response plan to be implemented if data in exceedance of established standards is released to the public and stakeholders.	The Risk-Based Decision Subcommittee will review and revise, as necessary, the draft response-to-contamination decisions framework proposed by the GIT to the NMED. The decision framework will identify decision criteria such as exceedances of MCLs at accessible locations. Once the draft decision framework is determined to be complete by the subcommittee, it will be provided to the EAG for review and comment.	Cost and schedule impacts included in 7-00-34.
7-00-37	Develop list of MCLs, or other guideline, for potential chemicals of concern.	The risk assessor of the Risk-Based Decisions Subcommittee will ensure that such a list is available, either as a stand-alone document or as a list of readily accessible references.	Cost and schedule impacts included in 7-00-34.
7-00-38	Risk assessment process for subpopulation groups is to be flexible and iterative.	The Risk-Based Decisions Subcommittee will be aware of current and emergent discussions regarding risk assessment scenarios through member involvement in the ER Project's integrated risk assessment team. Non-standard receptors and/or exposure scenarios that are determined to be reasonable and appropriate for contamination identified in groundwater will be included in risk assessments for the groundwater pathway, when such risk assessments are deemed necessary to support a decision. Those situations will be identified in the decision framework discussed in Response Action 4.	Cost and schedule impacts included in 7-00-34.



## APPENDIX A: COMPREHENSIVE LIST OF RECOMMENDATIONS AND STATUS OF PROPOSED ACTIONS

The EAG will produce two reports, e.g., "External Advisory Group Semi-Annual Report", for each fiscal year of implementation of the Hydrogeologic Characterization Program. Each report will contain the EAG's comments and recommendations. The Laboratory will address the comments and recommendations in an action plan for each of the EAG's reports.

Thus far, three EAG reports have been published: November 1998, July 1999, and December 1999. Table A-1 provides a matrix matching EAG reports with the Laboratory's action plan addressing each report.

**Table A-1: EAG Reports and Corresponding LANL GIT Action Plans**

<b>EAG Report</b>	<b>Date</b>	<b>LANL GIT Action Plan</b>	<b>Date</b>
"Semi-Annual Report to the Groundwater Integration Team of the Los Alamos National Laboratory by the External Evaluation Group"	11-98	"Los Alamos National Laboratory Groundwater Integration Team Action Plan for External Evaluation Group November 1998 Recommendations"	2-99
"Semi-Annual Report to the Groundwater Integration Team of the Los Alamos National Laboratory by the External Advisory Group"	7-99	"Los Alamos National Laboratory Groundwater Integration Team Action Plan for External Evaluation Group July 1999 Recommendations"	11-99
"Semi-Annual Report to the Groundwater Integration Team of the Los Alamos National Laboratory by the External Evaluation Group"	12-99	This document	02-00

Table A-2 provides a mechanism for tracking past recommendations and the status of implementation of proposed actions. Each action has been given a "tracking" number, which includes the EAG report publication month and year. Notation is provided where recommendations are substantially the same in both the November 1998 and July 1999 EAG report.

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
12-99-1	Complete	Formation of a Senior Management Team to help define end product(s) with representatives from LANL, DOE, and NMED.	The Program Manager commits to identifying a manager willing to organize and chair this group. The assistance of EAG member Dr. Robert Charles may be requested to facilitate the initiation of the group.	The EAG/Managers meeting in March found general concurrence on the end state of the hydrogeologic characterization program. Continued semi-annual meetings with the managers will confirm the expected products.
12-99-2	Complete	Continued examination of add-on requests and divesting the GIT of items not specifically enumerated by the Workplan.	The Response to Contamination process is expected to keep a focus on the Hydrogeologic Workplan objectives. The definition of the end state by the management team will also help in maintaining a focus on the long-term objectives.	
12-99-3	In Process	Establishment of a policy for data distribution.	Data will be available on the Water Quality Database via the internet. The distribution of preliminary (unvalidated) data does require a process that has Laboratory management and legal counsel approval. The Program Manager will request the assistance of Laboratory Legal in developing a preliminary data distribution policy.	Data collected from runoff after the Cerro Grande fire has focused responsibility for development of a policy for data release on the Watershed Integration Team.
12-99-4	Complete	Re-enumeration of the criteria for well prioritization.	The GIT and NMED/HRMB have had initial discussions on the prioritization scheme and have agreed to reach a consensus prioritization at the Annual Meeting scheduled for March 2000.	
12-99-5	Pending	The EAG will meet with the CAB at a mutually agreeable time and place.	The GIT encourages the EAG to participate in a CAB meeting. If the timing of CAB meetings is not coincident with EAG meetings, then the Chair of the EAG should attend a CAB meeting.	

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
12-99-6	Pending	Development of a risk-based conceptual approach.	The Response to Contamination process incorporates a qualitative assessment of risk. The ER Project has developed a risk assessment approach that will be used in defining the scope of the response. A presentation of the risk assessment approach will be provided at the Annual Meeting in March.	The GIT has formed a subcommittee for risk decisions to provide more focus on risk assessment.
12-99-7	In process	The Selection of an individual on the GIT to lead development of subordinate DQO's, manage QAPP for the Workplan, and elucidate its relationship to the existing documents in the Environmental Restoration (ER) and Environmental Safety and Health (ESH) as well as the Workplan final products.	The adoption of Hydrogeologic Workplan activities into the ER Project QA system will begin with a Quality Assurance self-assessment. The assessment will provide the information necessary to bring a coherent and consistent QA system to the Hydrogeologic Workplan activities.	
12-99-8	In process	Development and regular updating of the web site for routine communication of data, issues, etc.	The ESH-18 web site will be expanded to include the GIT activities. The map and contents of the web site is under development now. The schedule and contents of the web site will be discussed at the Annual Meeting in March.	A draft web page has been developed and is in review.
12-99-9	In process	Data gathering activities should be guided by the development of the DQO processes for these activities and supports the efforts in this direction.	The GIT continues to promote the use of DQOs (or equivalent approaches) to planning data collection within the GIT Subcommittees.	The GIT has formed a subcommittee for risk decisions to provide more focus on risk assessment



Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
12-99-10	In process	The SOPs developed under the DQOs or DQO-like process be subjected to some form of external review prior to finalization.	As indicated in the response to recommendation 12-99-7, the GIT has recognized the need to formalize the QA implementation for Hydrogeologic Workplan activities. The ER Project administrative procedures require peer review for all documents.	
12-99-11	In process	The request of information needed to better understand the relationships of DQOs and SOPs to the QAPPs developed in ER and ESH to better evaluate the potential need for development of a QAPP for the Workplan.	The SOPs that are being used and those will that be developed for use on the drilling program undergo peer review as prescribed by the ER Project administrative procedures. A presentation on the ER Project QA program will be included in the Annual Meeting in March.	
12-99-12	Complete	Technical sessions be held for the purpose of examining data gathering at later semi-annual meetings.	The suggestions for technical sessions will be incorporated into the Annual Meeting agenda to the extent possible given time constraints.	
12-99-13	Complete	The plan for a comprehensive Water Quality Database and input from users in both the preliminary and latter stages of a database module's development should be continued.	The Water Quality Database (WQDB) development team has adopted the EAG recommendation to implement the system's water level module prior to the chemistry module. The WQDB development team completes a software design process prior to any programming. This process helps ensure that the system will meet the needs of users, thereby reducing the potential for system rewrites due to inadequate implementation. The modular design process includes a cooperative effort between development team members, GIT subject matter experts, and additional representatives of the end-user community.	

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
12-99-14	In process	Continue with efforts to better understand the spatial distribution of infiltration, porosity, and hydraulic conductivity.	The modeling approach that will be taken is to use statistically based distributions as input for hydrologic parameters that are based on (and constrained by) the data collected from the R-wells. This statistical approach to developing input parameters in the hydrologic models will be discussed at the Annual Meeting in March.	
12-99-15	In process	The EAG promotes the geochemical modeling as it relates to fate and transport of contaminants or where it can yield better understanding of ground water flow directions and rates.	Geochemical modeling continues to be an interpretative task for the GIT Geochemistry Subcommittee.	
12-99-16	Complete	The EAG recommends better evaluation of the advantages and disadvantages of using parameters developed from surface complexation modeling versus the incorporation of simple linear isotherm Kd values in the models and the use of non site specific Kd.	The GIT concurs with the need to include surface complexation modeling in the "toolbox" for interpreting data collected for the hydrogeologic characterization program. The Geochemistry Subcommittee has begun modeling simulations to determine Kds from surface complexation.	
12-99-17	Complete	Properly designed profile wire screens in the monitoring wells should be used.	Wire screens are currently planned for all of the wells. If alternative types of well screens are considered in the future, the EAG will be asked to provide technical review.	

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
12-99-18	In process	All processes involved in creating and sampling the monitoring wells should be considered within the context of capturing the information needed to accomplish the monitoring objectives.	The GIT Geochemistry Subcommittee has been assigned the task of evaluating the considerations brought forward by the EAG and providing recommendations to the GIT regarding those considerations. A presentation on groundwater sampling at the Annual Meeting in March will address these recommendations.	The GIT has formed a subcommittee for risk decisions to provide more focus on risk assessment
12-99-19	Complete	Unencumbered casing advance drilling should be used as a substitute for mud rotary drilling if extensive data needs are not needed.	At present, casing advance is the only well drilling method planned. However, the GIT will continue to evaluate alternative drilling methods suggested by stakeholders. The EAG will be essential to evaluation of alternative drilling methods.	
12-99-20	Pending	For long screen wells that are already installed, characterize flow rates across the screened interval with depth and/or characterize the well for contaminants along the screen length to determine where to place the pump.	The GIT Geochemistry Subcommittee is evaluating the concerns regarding well drilling, well design, and sampling methods and will report on their recommendations at the Annual Meeting in March.	
12-99-21	Pending	Different construction techniques should be considered for long-screen completions that are not yet installed.	The GIT Geochemistry Subcommittee is evaluating the concerns regarding well drilling, well design, and sampling methods and will report on their recommendations at the Annual Meeting in March.	

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
12-99-22	Pending	The monitoring wells at LANL should not be screened above the water table.	The Technical Enforcement Guidance Document has been used for technical construction specifications for screen placement. However, the GIT Geochemistry Subcommittee is evaluating the concerns regarding well drilling, well design, and sampling methods and will report on their recommendations at the Annual Meeting in March.	
12-99-23	Pending	Different construction techniques (i.e., not single long screen) should be considered for wells that will be subjected to screen aeration as the water table drops during the well's lifetime.	The GIT Geochemistry Subcommittee is evaluating the concerns regarding well drilling, well design, and sampling methods and will report on their recommendations at the Annual Meeting in March.	
12-99-24	Pending	Low-flow sampling should be used for routine monitoring in all the monitoring wells at LANL due to the potentially detrimental impacts of high-flow sampling on sample quality.	The GIT Geochemistry Subcommittee is evaluating the concerns regarding well drilling, well design, and sampling methods and will report on their recommendations at the Annual Meeting in March.	
12-99-25	In progress	The proper collection of core sequences should be continued for the deep monitoring wells installed in areas having high expected contaminant probability. Consideration must be given to reducing the amount of coring in locations where contaminants are considered to be unlikely, thus speeding well installation.	The amount of coring planned for each borehole is determined based on a number of factors including hydrologic uncertainties, stratigraphic uncertainties, and expectations regarding contaminants. The GIT feels that the uncertainties in the hydrologic and geologic setting should be weighed equally with presence of contaminants.	Coring needs are determined on a well-by-well basis.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-99-1	Complete	Develop an understanding of the relationships of upper management among the stakeholders.	The upper management of LANL, DOE, and NMED will be invited to the quarterly meetings, annual meeting, and the next EAG meeting.	Combined with Recommendation <b>11-98-4</b> . The GIT chairperson has provided briefings as requested and will continue to be available on an on-call basis for briefing upper management.
7-99-2	Pending	Pursue some aspects of benchmarking.	Potential contractors have been contacted to determine their capabilities in this area and initial ideas for a scope of work have been discussed.	Combined with Recommendation <b>11-98-18</b> . The benchmarking study is important to the GIT and some progress has been made toward implementing this study. Due to budget constraints, the study can not be started until October 1999.
7-99-3	Complete	Continue meetings between external stakeholders and the EAG.	The GIT intends to continue this forum of expression and feedback at EAG meetings.	The feedback from the stakeholders has been positive.
7-99-4	Pending	Continue extensive communication efforts, including the expansion of Internet utilization.	In addition to formal and informal meetings with the stakeholders, the GIT plans to make information accessible via the Internet.	Combined with Recommendation <b>11-98-1</b> . The Water Quality Database will be accessible through the Internet. A GIT web page with links to searchable GIT minutes, the Hydrogeologic Workplan, field implementation plans, well completion reports, daily drilling reports, and other documents have been under consideration.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-99-5	Complete	Continue preparation and implementation of action plans responding to the EAG's recommendations.	An action plan will be prepared in response to each EAG report.	The recommendations have been numbered to facilitate tracking. Each successive action plan will provide a status of cumulative set of recommendations to ensure that each is fully addressed.
7-99-6	Complete	Continue providing meeting locations that enhance focus.	The meeting locations will be off-LANL whenever possible to enhance focus.	Positive feedback was received on the choice of Ghost Ranch for the location for the annual meeting. Similar settings will be considered for future meetings.
7-99-7	Complete	Prepare hard copies of presenter's more technical transparencies.	The overheads will be compiled into a meeting booklet to facilitate the EAG program reviews.	
7-99-8	Complete	Add some technical sessions.	There will be increased time allotted to technical presentations. Concurrent sessions may be appropriate if the participants at meetings have clearly defined and distinct interests that can be addressed in separate sessions.	The GIT would like to try this approach on a pilot basis. There is a concern that some stakeholders may feel left out of discussions that are held concurrently.
7-99-9	Pending	Add EAG members for geoscience and economics expertise and, possibly temporary members in other areas.	The GIT requests that the EAG identify potential new members and invite their commitment to serve on the EAG.	The GIT concurs in the need to expand the fields of expertise within the EAG.
7-99-10	Pending	Develop a risk-based conceptual plan in three categories: Chemicals of Concern, Source, Transport and Fate, and Exposure to Receptors.	A plan to address contamination found while implementing Hydrogeologic Workplan activities will be presented to NMED and EAG during the October meeting.	Development of this plan requires coordination of different groups and programs within LANL so that it can be incorporated into the re-issued RCRA permit.
7-99-11	Pending	Have EAG review LANL's risk assessment team results and future plans.	The EAG will be asked to review the planned response to detecting contamination at the October meeting	

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-99-12	Pending	Develop a risk-based approach for interpreting the significance of finding on-site well contamination; as the site-specific, alternate contaminant level (ACL) approach has proven most useful for complex sites such as LANL.	Initial inputs to this plan were discussed at the Annual Meeting and work on it is continuing. The development of this plan requires coordination of different groups and programs within LANL so that it can be incorporated into re-issued RCRA permit.	Combined with Recommendation <b>11-98-7</b> . The ACL criteria have been incorporated into the response for detecting contamination.
7-99-13	Pending	Compare such plans to those used by other regulatory agencies (e.g. EPA) and other states.	The GIT will obtain the available resources and use them in the development of the response plan.	The GIT understands that this program is not an unfamiliar task.
7-99-14	Pending	Establish acceptance of site specific ACLs.	The ACL criteria have been incorporated into the response to detecting contamination as a first step to establishing the response to contamination.	Combined with Recommendation <b>11-98-2</b> . The GIT agrees that the process for establishing ACLs should be part of the response plan. However, the GIT feels that it is inappropriate to propose actual numbers for ACLs until more is known about the hydrogeologic characteristics of the specific locations for which they might be proposed.
7-99-15	Complete	Reconsider the Hydrogeologic Workplan DQO scenarios when updating the hydrogeologic conceptual models.	The conceptual models will be refined based on new data collected in this program. The DQO scenarios, which are based on the conceptual models, will likewise be refined as appropriate.	The GIT is in agreement with this recommendation. Each GIT subcommittee has been asked to begin the DQO process with the data collected thus far.
7-99-16	Pending	Develop DQOs for processes subordinate, but essential to, the hydrogeologic characterization such as well completion, sample collection, data validation, database development, and model development.	The GIT subcommittees have been encouraged to use the DQO process (or a DQO-like process) in the areas mentioned in the recommendation and in all of their planning activities.	

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-99-17	Pending	Data gathering efforts should utilize DQO processes and a special session discussing these efforts should be held.	The GIT subcommittees have been encouraged to use the DQO process (or a DQO-like process) to develop comprehensive Standard Operating Procedures for data collection. At the next EAG meeting, the GIT will provide a report on the status of this activity.	
7-99-18	Complete	Database issues should be clarified, and funding issues for database development should be given a high priority	The Information Management Subcommittee has brought on a project management specialist to develop a resource-loaded schedule in order to develop a request for funding adequate to support the information management system development and maintenance.	Combined with Recommendation 11-98-14.  The GIT recognized information management as the keystone of this program. Development of the system is lagging in the information collection in the program. This is primarily due to funding priorities and constraints.
7-99-19	Complete	The geologic model should be used for preliminary predictions of stratigraphic boundaries.	The predictions on the stratigraphic contacts will continue to be used in the Field Implementation Plan. As more data are added to the geologic model, these predictions will become more certain.	Predicted stratigraphic contacts are included in the Field Implementation Plan. The predictions come from the stratigraphic model. In areas of LANL where there are more nearby wells, the predictions are closer to reality than in areas of LANL where less is known. The basalts are a "wild card" because the geologic controls on the distribution are not well known.
7-99-20	Complete	An overall geochemical model should be developed.	A budget will be requested for this task. Each subcommittee member is engaged in the process so that the FY00 budget request will include adequate funding.	One goal of the GIT Geochemistry Subcommittee is to develop an overall geochemical model.



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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-99-21	Pending	Present more geochemical calculations and carry out sorption isotherm experiments.	These are interpretive tasks that will have a funding request for FY00. Sorption studies are planned for areas where contamination is encountered so that remedial options can be developed.	
7-99-22	Complete	Additional hydrogeologic modeling results should be presented.	<b>The modeling presentations for the next EAG meeting will focus on the technical details of the modeling accomplished thus far.</b>	Combined with Recommendation 11-98-23. The budget constraints for the modeling effort are a result of the difficulties at well R-25. The response to the constraints is to focus on documenting what has been done rather than further development. This focus will have the additional benefit of having materials prepared for the next EAG meeting.
7-99-23	Complete	The segmented approach to site modeling should be continued.	The segmented approach to site modeling will be continued.	Approaching the modeling at three different scales seems to be effectively providing modeling results to many users at the same time.
7-99-24	Pending	Review of hydrologic modeling reports is requested by the EAG.	The EAG will be requested to review the hydrologic modeling reports.	
7-99-25	Pending	The locations and rates of recharge should continue to be defined.	The results of the plateau-scale modeling will be presented at the October meeting.	In addition to the preliminary recharge discussion presented at the Annual Meeting, the plateau-scale modeling has indicated that recharge is a sensitive parameter in the model.
7-99-26	Pending	Improvement of drilling cost analyses, as part of benchmarking should continue.	Some potential contractors have been contacted to determine their capabilities in this area, and initial ideas for scope of work have been discussed.	The benchmarking study is important to the GIT.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-99-27	Pending	Review of the design of stainless steel screens installed in the deep monitoring wells is requested by the EAG.	The EAG will be requested to review the well design for each well.	The specifications for well construction are included in the Field Implementation Plan for each well.
7-99-28	Pending	Evaluate drilling method after five or six wells have been drilled using the current method.	The procurement for continued drilling services will take place this fall. More discussions will occur before the drilling method(s) will be specified.	The new drilling procurement will allow the flexibility to try different drilling methods if the drilling costs remain high after five or six holes.
11-98-3	Complete	Have NMED representatives present during some portion of the next EAG meeting.	Arrangements will be made with NMED to attend appropriate portions of the meeting.	Inviting stakeholders to EAG meetings will continue.
11-98-6	Complete	The proper sequence of priorities should be consistent in Tables 4.1 and 4.2.	Tables 4-1 and 4-2 in the Hydrogeologic Workplan (May 22, 1998) will be revised as the program evolves and new data is collected.  The priority sequence will be adjusted during quarterly meetings and will be reflected in the Annual Report.  Information in Tables 4-1 and 4-2 will be updated on an annual basis and included in the Annual Report.	The tables will be updated in every annual report.
11-98-9	Complete	Core should be logged and evaluated as soon as possible after retrieval. Core that will be used for parameter testing or sorptive potential should be stored in an intact state and tested as soon as possible.	The procedures for handling core include logging the retrieved core as soon as possible after extraction.  Immediately after logging, sections of the core that are of possible hydrologic, geologic, or geochemical interest are preserved.  After the core from the entire borehole has been collected, portions of core are selected for testing.	Adherence to the Standard Operating Procedures for handling core and other samples will continue to preserve the integrity of the samples.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
11-98-11	Complete	Review data needs on a continual basis and review the scope of the characterization program on an annual basis in light of what the regulators require.	The Hydrogeologic Workplan was developed on the premise that data needs would be reviewed with each addition of new data and the scope of the program adjusted based on that review. The regulators are regularly involved in this review via the Annual Meeting, Quarterly Meetings, and informal meetings as required.	Continual re-evaluation of the data needs will continue in conjunction with stakeholder and EAG input.
11-98-13	Complete	WESTBAY systems should be demonstrated and well understood before it is used.	LANL personnel have taken a number of steps to investigate WESTBAY system including visiting sites with WESTBAY systems installed for demonstration of sampling, and studying literature from sites that are using WESTBAY systems.  The next demonstration of the WESTBAY system will be as installed in the R-25 well. Completion decisions for each well will be made after the drilling and initial sampling have been completed and will be based on the conditions encountered in each well. WESTBAY systems will only be installed in wells for which it is suitable.	The use of WESTBAY systems will be evaluated on a well-by-well basis and will incorporate stakeholder and EAG input.
11-98-17	Complete	Place filter packs greater than 2 feet (10 to 20 feet) above the top of the screens to account for settling of the filter material in wells that may be used for monitoring.	Filter pack will be placed 2 feet above the perforations; additionally 3 feet of fine sand will be placed above the filter pack.	Adherence to the Standard Operating Procedures for well construction will continue to preserve the integrity of the well.
11-98-22	Complete	Consider periodic rebid of drilling work on a combination of per-foot basis for drilling and coring and per-hour basis for other activities.	Rebid of the drilling contract will consider definition of per-foot charges for certain activities and per-hour charges for other activities.	The initial meetings to develop the drilling procurement documents have focused on how to structure the compensation framework.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
11-98-1	see 7-99-4	Continue the frequent, detailed and exhaustive communication efforts to keep relationships on the upswing with the regulators and the community as well as the funding organizations.	Maintain communication with stakeholders at the level that it has been for the past 2 years. Formal meetings will occur five times a year – four quarterly meetings and one annual meeting. Informal meetings and communication (e-mail, phone calls) will also continue as new information warrants. Make data accessible through the Internet.	Web interface will be operational in approximately one year. This recommendation is combined with 7-99-4 for further action.
11-98-2	see 7-99-14	Reach agreement with NMED on MCL's (and ACL's).	Initial discussions about MCLs and ACLs occurred at January 1999 Quarterly Meeting. Proposed approach in Annual Report. The proposed approach was discussed the Annual Meeting in March.	Requires coordination and consensus within the Laboratory (ESH-18, ER Project) to develop groundwater cleanup levels that can be proposed to NMED. This recommendation has been combined with recommendation 7-99-14 for action.
11-98-7	see 7-99-12	Develop contingency for examination of intermediate zones, particularly working with stakeholders to evaluate tradeoff between deep wells and shallower wells.	A proposed approach will be discussed with NMED at the Annual Meeting. The approach, when finalized, will be formalized by inclusion in the RCRA permit when it is reauthorized.	Requires coordination and consensus within the Laboratory (ESH-18, ER Project) to develop an approach that can be proposed to NMED. This recommendation has been combined with recommendation 7-99-12 for action.
11-98-14	see 11-99-18	FIMAD should more rapidly incorporate legacy data and the system be available for timely use by stakeholders	Environmental surveillance data and data collected under this program to be available through the Internet. Groundwater data will be linked to Environmental Restoration data, but the exact relationship of the Water Quality Database to FIMAD has not been determined.	The Groundwater Database is in development. This recommendation has been combined with 11-99-18 for action.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
11-98-15	Complete	The three-person drilling crew should have backups in case of fatigue, illness, or other reasons.	Evaluate the possibility of training another three-person crew.	The staffing provided by the driller under their contract is under close scrutiny. The procurement for continued drilling services to be released this fall might specify staffing levels.
11-98-20	Complete	Revise budget and update budget projections on a continual basis to reflect the iterative nature to the program.	There is quarterly reporting on the budget, an annual post mortem, and a projection for the next fiscal year. Budget revisions will be discussed at the annual project review.	This recommendation will be fully implemented at the annual project review scheduled for October 1999.
11-98-21	Complete	Have an annual project review to identify mid-course corrections and ensure cost-effective management and execution. The review should include performance reviews, costs to date, next year's tasks, and proposed budget.	An annual project review will be initiated for FY99. The review will include technical and management performance review, previous year costs, and next year tasks, and proposed budget. Participants will include LANL organizations (ESH-18, ER, EES, NWT) and DOE.	An annual project review is scheduled for October 1999.
11-98-23	see 7-99-20	Use modeling as a tool to evaluate the need for and location of future wells and as a communication tool with stakeholders.	Planned modeling activities for FY99 should produce a working model that can be used for this purpose. The model will also be used to communicate the program with stakeholders.	This recommendation has been combined with 7-99-20 for action.
11-98-4	see 7-99-1	Have a better description of the relationship and support within LANL for the activity, including how the management of ESH, ER, NWT, etc. regards the activity with respect to their other priorities.	A description of how the Hydrogeologic Workplan activities fit within the LANL structure will be prepared for the next meeting of the EAG.	This recommendation is combined with 7-99-1 for action.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
11-98-5	Complete	Have a more detailed stakeholders identification map defining relationships other than the three to five major stakeholders.	A stakeholder identification map will be prepared for the next meeting of the EAG.	The complete implementation of this recommendation is now scheduled for the October 1999 meeting of the EAG.
11-98-8	see 12-99-24	Use low-flow purging and sampling techniques for water-yielding wells and passive sampling for poorly-yielding wells.	The options and technical basis for each option should be an agenda item for the next meeting of the EEG.	This issue will have increased importance when a well is completed and quarterly sampling begins. Consensus with stakeholders on the use of these sampling techniques must be reached before sampling begins. This recommendation has been combined with 12-99-24 for action.
11-98-10	Complete	Consider using cement seals if the bentonite grout seals fail under certain circumstances.	Should the situation arise that bentonite seals are not effective, then other sealing options (including cement seals) will be considered, evaluated, and tested in order to continue the drilling.	In the event that other seals are necessary, the EAG will be asked to provide input on the sealing options. NMED will have to concur with any decision to change the well completion specifications.
11-98-12	see 12-99-19	Avoid mud-rotary drilling in order to preserve the pristine nature of subsequent samples.	There are no plans to use mud rotary-type drilling for the regional wells.  Mud rotary-type drilling may be used in other circumstances, such as installation of wells targeted for the intermediate zone(s) where the exact depth and configuration is known prior to the start of drilling.	When mud rotary and other drilling methods are under consideration, the EAG will be asked to provide input on the options. Input from NMED will be requested with any decision to change the well drilling methods. This recommendation has been combined with 12-99-19 for action.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
11-98-16	Complete	Complete the wells with metal fittings rather than PVC.	<p>Currently all deep wells are planned for metal fittings.</p> <p>There may be conditions under which PVC fittings would be considered, but that decision would be made on a case-by-case basis considering the factors in the situation and weighing the pros and cons of PVC.</p> <p>This decision would not be made without seeking input from the stakeholders and technical experts.</p>	In the event that other fittings are evaluated for use, the EAG will be asked to provide input on the options. NMED will have to concur with any decision to change the well completion specifications.
11-98-18	Pending	Benchmark the costs-to-date against similar activities.	A benchmarking study will be initiated in early 1999 with the goal of having preliminary results for the next EAG meeting.	The GIT concurs with this recommendation. This recommendation is combined with recommendation 7-99-2 for action.
11-98-19	Complete	Develop more detailed GANTT chart with scheduled deliverables that indicates how the results of the hydrologic investigations will be incorporated into the RFIs and CMSs.	<p>How hydrologic results will be incorporated into ER Project documents will be determined and described.</p> <p>A GANTT chart may not be the best presentation of this information.</p>	The complete implementation of this recommendation is now scheduled for the October 1999 meeting of the EAG.