JULY 2002

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LANL General: Hydrogeologic Workplan Quarterly Meeting 7/24/02

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FY03 Proposed Work

Charlie Nylander
Hydrogeologic Characterization
Program Manager

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Proposed FY03 Field Activities

- Drill and complete:
  - **NWT: R-2, R-6, R-11, & R-24**
  - **ER: R-4 & R-18**
- Characterization sampling and analysis in completed wells
- Hydrologic testing in new wells

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Pueblo Canyon: Wells R-2 & R-4

- R-2 is a replacement for TW-4
- Pueblo Canyon has contamination, it is wet, has short travel times due to the rocks at the surface, so it is important to investigate.
- Wells along the length of the canyon would be useful for demonstrating Monitored Natural Attenuation.
- Tb2 basalt is near the top of the water table, but is poorly constrained around R-2.
- TW-2A (perched zone completion) has had high tritium for a long time and a few indications of plutonium (not reproduced)
- Would complete LA/Pueblo Canyon planned groundwater investigation

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Los Alamos Canyon Well R-6

- Provides up-gradient water quality in for northwestern portion of the Lab
- Depth to regional aquifer in western part of Lab
- Investigate western extent and character of Totavi lentil

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Sandia Canyon: Well R-11

- R-11 is proposed as a sentry water well for PM-3.
- Would be useful for interpreting information from Mortandad Canyon
- R-11 identified as anticipated monitoring well by ER Project
- R-11 could be located close enough to PM-3 to conduct cross- hole testing

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Pajarito Canyon: Well R-18

- R-18 was proposed to provide information on presence, occurrence and quality of perched zones and depth to regional aquifer in poorly understood part of the Lab.
- This well is necessary because there are no wells in upper Pajarito Canyon.
- Better understanding of perched zone in R-25
- Due to access, R-18 can not be drilled where it was shown on the Hydrogeologic Workplan map; relocated to Pajarito and 2-Mile confluence

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Cañon de Valle: Well R-24

- R-24 located west of the fault system, useful to refine recharge and boundary flux estimates.
- The Pajarito Fault zone could divert water to the south; need geochemical data to determine flow paths.
- Hydrologic testing could determine if the fault was acting as a barrier to flow.
- Useful for estimating background water quality

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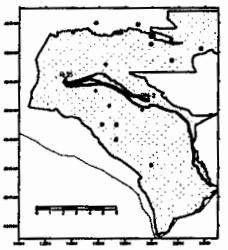
FY03 Non-Field Activities



- **Information Management**
- **Groundwater Pathways Assessment**
- **Regional aquifer modeling**
- **Geologic Model**
- **Quarterly and Annual Meetings**
- **Annual Report**

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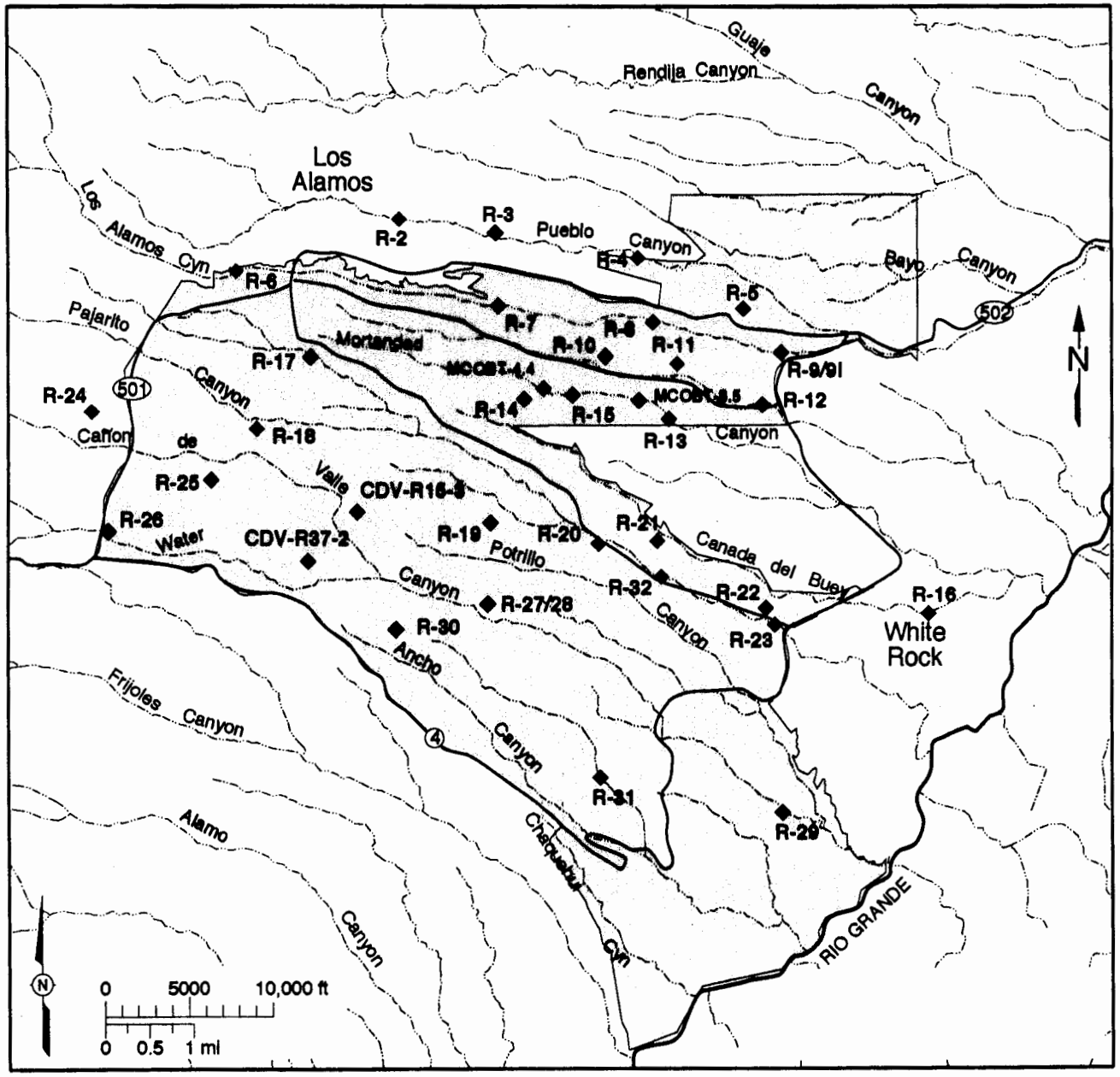

R-8, R-13, R-14 completed so far this FY

- Completed well
- Add'n planned wells this FY
- Proposed wells for FY03
- Out year well

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Groundwater Protection Core Team

Beverly Ramsey
Director, Risk Reduction and Environmental Stewardship Division

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Core Team Purpose

- Provide leadership and guidance to Groundwater Protection Program
- Address criticisms that the hydrogeologic characterization program lacked management support
- Improve communication between DOE, NMED, and LANL management on groundwater issues

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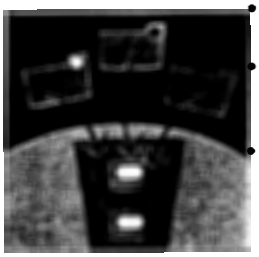
Core Team Membership



- **LANL** – Beverly Ramsey; Scott Gibbs
- **DOE** – Mat Johansen, Joe Vozella
- **NMED** – James Bearzi, Greg Lewis

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Core Team Actions to Date

- Develop groundwater protection objectives for LANL
- Formed a Groundwater Technical Team
- Request a 3-Year tactical plan to be developed by the Groundwater Technical Team
- Plan to develop a long-term strategic plan for groundwater protection

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Groundwater Technical Team

- Small team with equal number of members from LANL, DOE, and NMED
- Joint technical decision-making
- Support Core Team
- Improve technical communication

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Core Team 3-Year Objectives

- **Characterization:**

1. Characterization sufficient to design a regional aquifer monitoring for water supply, RCRA Subpart F facilities, and the down-gradient boundary.
2. Characterize high priority known release areas (Mortandad, Pueblo, TA-16) to determine nature and extent of plumes, sufficient to design remedy.

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Core Team 3-Year Objectives

- **Monitoring:**

1. Have regional aquifer monitoring capability largely in place for water supply, RCRA Subpart F facilities, and the down-gradient boundary.
2. Monitoring for compliance with HSWA should be initiated.
3. Refined hydrogeologic conceptual model using analytical tools, characterization, and monitoring data to continually increase the reliability of model predictions of the system.

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Core Team 3-Year Objectives

- **Source Control (protection of the regional aquifer and prevention of connectivity):**

1. One or more remediation systems tested and implemented in high priority release areas to assess effectiveness.

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Los Alamos National Laboratory Groundwater Protection Program

Charlie Nylander

Program Manager

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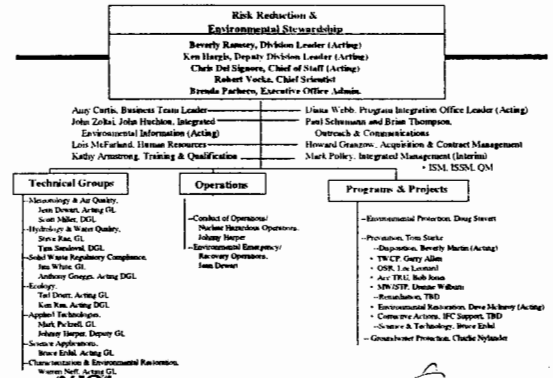

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Groundwater Protection Program Responsibilities

- Hydrogeologic characterization
- Interpretation and analysis of hydrogeologic data
- Monitoring and surveillance
- Groundwater resource stewardship
- Regulatory compliance
- Groundwater corrective action

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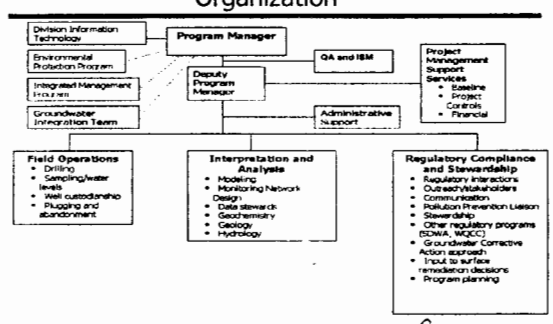
Groundwater Protection Program Functional Organization



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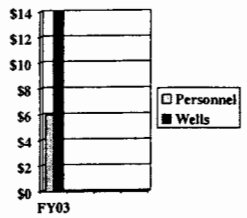
Groundwater Protection Program Requested FY03 Baseline



- FY03 Personnel Budget: $6,017,027
- FY03 Well Drilling & Construction: $14,000,000

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STATUS REPORT FOR GEOCHEMISTRY SUBCOMMITTEE,

GROUNDWATER INTEGRATION TEAM

BY

BRENT NEWMAN, PATRICK LONGMIRE,
DALE COUNCE, AND DAVID ROGERS

JULY 24, 2002

OBJECTIVES OF PRESENTATION

Present a summary of geochemical investigations conducted at Los Alamos National Laboratory from April through July 2002.

Topics of interest include:

- **Characterization of Drilling Fluids**
- **Quarterly Groundwater (Characterization) Sampling**
- **Geochemistry Characterization Reports**
- **Advanced Hydrotest Facility**

CHARACTERIZATION OF DRILLING FLUIDS

Drilling Fluids

- **Torkease, Ezmud, Quikfoam, Aqua-Clear PFD, SDI, Aquagel Gold Seal, Barolift, N-seal, PAC-L, and Quick-Gel**

Extraction Media

- **Deionized water, hydrochloric acid (TCLP, pH4.5), and nitric acid (3015 and 3051 methods, pH1)**

Extraction procedures

- **Leach or digest samples for 48 hours using deionized water, hydrochloric acid, or nitric acid**
- **Filter leachates through 0.45 μmeter membranes**
- **Analyze leachates using ion chromatography (anions), ICP-OES and ICP-MS (metals and nonmetals), ion selective electrode (ammonium), titration (alkalinity), GC-MS (semivolatile organic compounds), and TOC analyzer**

R-WELL SCREENS, MEASUREMENT PORT DEPTHS, AND SAMPLING ROUNDS

- **R-5** — **Four Screens; 169 ft, 375 ft, 678 ft, and 860 ft; 1 Round**
- **R-7** — **Three Screens; 378 ft, 744 ft, and 915 ft; 4 Rounds**
- **R-8A** — **Two Screens; 731 ft, 825 ft; *0 Rounds (09/02)***
- **R-9** — ***Single Screen*; 741 ft; 4 Rounds**
- **R-9i** — **Two Screens; 199 ft and 279 ft; 4 Rounds**
- **R-12** — **Three Screens; 468 ft, 507 ft, and 811 ft; 4 Rounds**
- **R-13** — ***Single Screen*; 940 ft; 1 Round (07/02)**
- **R-15** — ***Single Screen*; 1019 ft; 4 Rounds**

GROUNDWATER PROTECTION PROGRAM

R-WELL SCREENS, MEASUREMENT PORT DEPTHS, AND SAMPLING ROUNDS

- **R-19** — **Seven Screens; 844 ft (dry), 909 ft, 1190 ft,1413 ft, 1586 ft, 1730 ft, and 1835 ft; 4 Rounds**
- **R-22** — **Five Screens; 906 ft, 962 ft, 1273 ft, 1379 ft, and 1449 ft; 4 Rounds**
- **R-25** — **Eight Screens; 755 ft, 892 ft, 1063 ft, 1192 ft, 1303 ft, 1406 ft, 1605, and 1796 ft; 4 Rounds**
- **R-31** — **Five Screens; 439 ft, 515 ft, 666 ft, 827 ft, 1007 ft; 2 Rounds**
- **MCO-BT-4.4** — ***Single Screen*; 493 ft; 1 Round (06/02)**
- **CDV-15** — **Six Screens; 624 ft (dry), 806 ft (dry), 980 ft (dry), 1254 ft, 1350 ft, 1640 ft; 6 Rounds**
- **CDV-37** — **Four Screens; 927 ft, 1201 ft, 1365 ft, 1553 ft; 2 Rounds**

Post characterization sampling is being conducted during July and August 2002.at several wells (R-22 [highest priority], R-25, R-15, R-9, R-9I, R-12, R-7, and R-19 [lowest priority])

SUMMARY OF CONSTITUENTS OF INTEREST IDENTIFIED AT R-WELLS
(Four Characterization Rounds with Validated Data)

Well	Zone	Sample	Chemical	Concentration (Average)
R-9i	Perched (2)	Well	Tritium	200 and 129 pCi/L
R-9	Regional	Well	Tritium	11.8 pCi/L
R-12	Perched (1)	Well	Tritium	141 pCi/L
R-12	Regional	Well	Tritium	63.4 pCi/L
R-15	Regional	Well	Tritium	1.71 pCi/L
		Well	Nitrate plus nitrite (as N)	2.33 mg/L
		Well	Perchlorate	4.19 μg/L (single J value)

GEOCHEMISTRY CHARACTERIZATION REPORTS

- **Geochemistry Characterization Reports for R-9 and R-9i, R-12, R-15, and R-19 have been prepared and provided to DOE as formal deliverables**
- **Geochemistry Characterization Reports provide information on analytical results for inorganic and organic chemicals and radionuclides measured during four sampling events**
- **Geochemical interpretation including calculations is provided in each report**

ADVANCED HYDROTEST FACILITY

- **Collect core samples in Sandia Canyon (5 cores) and Mortandad Canyon (3 cores) at the proposed site for the Advanced Hydrotest Facility (AHF)**
- **Perform leaching tests using deionized water and analyze leachate solutions for anions (including perchlorate and nitrate) and nitrogen isotopes**
- **Analyze core samples for tritium, strontium-90, isotopic uranium, and stable isotopes of hydrogen and oxygen**
- **Analyses of core samples will provide supplemental data for vadose zone geochemistry in Sandia Canyon and Mortandad Canyon and will further delineate contaminant distributions in the Bandelier Tuff**

SUMMARY

Geochemistry Subcommittee members have collected characterization groundwater samples from R-13, CdV-15, CdV-37, and MCOBT-4.4 from April through July 2002.

Borehole samples have been collected from R-14.

Geochemistry reports for R-9 and 9i, R-12, R-15, and R-19 have been delivered to DOE.

Groundwater with measurable tritium occurs at MCOBT-4.4, R-5, R-7, R-8, R-9, R-9i, R-12, R-15, and R-25. These wells contain a component of groundwater less than 60 years old. Activities of tritium are less than detection at well R-19, indicating that the well is not impacted from the Laboratory.

SUPPLEMENTAL MATERIAL FOR GEOCHEMISTRY SUBCOMMITTEE

ANALYTICAL METHODS EPA SW846

- **Metals- Inductively Coupled Plasma Optical Emission Spectroscopy and Inductively Coupled Plasma Mass Spectrometry**
- **Anions- Ion Chromatography**
- **Organic Compounds- Gas Chromatography and Gas Chromatography-Mass Spectrometry**
- **High Explosive Compounds- High Pressure Liquid Chromatography and Diode Array Detector**
- **Radionuclides- Alpha Spectrometry, Gas Proportional Counting, Gamma Spectroscopy, Direct Counting, Electrolytic Enrichment**
- **Stable Isotopes- Isotope Ratio Mass Spectrometry**
-

SAMPLING PROTOCALS AT R-WELLS

- **Purge single completed wells, removing at least 3 well bore volumes; measure field parameters; collect; filter; and preserve (if required).**
- **Collect groundwater samples at multicompleted wells; measure field parameters; filter; and preserve (if required). Groundwater samples are collected using the Westbay Instruments at a rate of four liters per hour (one trip per hour).**

GIT Modeling Subcommittee Report Quarterly Meeting

Bruce Robinson

July 24, 2002

Modeling Activities This Quarter

- Geologic Model – incorporates new R-well data since the FY99 model was constructed
- Regional Aquifer Model
  - Incorporation of new geologic model
  - Publications
- Groundwater Pathways Assessment Project
  - Several meetings to discuss conceptual models and parameters
- VOC plume model for Area L – improved numerical and conceptual model based on ITRD review comments

Recent Publications

- Keating, E.H., Kwicklis, E. and Manley, K. (2002a) Overview of the Hydrogeology of the Espanola Basin. *in review* Hydrogeology Journal LAUR-02-4480
- Keating, E.H., Vesselinov, V.V., Kwicklis, E. and Lu, Z. (2002b) Coupling Basin- and Local-Scale Inverse Models of the Espanola Basin. *accepted* Groundwater. LAUR-02-484
- Robinson, B. A. (2002). A Particle Tracking Transport Method for the Simulation of Resident and Flux-Averaged Concentration of Solute Plumes in Groundwater Models, submitted to Water Resour. Res., LA-UR-02-2231
- Vesselinov, V.V. and Keating, E.H. (2002) Analysis of capture zones of the Buckman wellfield and of a proposed horizontal collector north of the Otowi Bridge. Los Alamos National Laboratory Progress report, Hydrogeologic Characterization Program,.LAUR-02-2750.
- Vesselinov, V.V., Keating, E.H. and Zyvoloski, G.A., (2002) Analysis of model sensitivity and predictive uncertainty of capture zones in the Española Basin regional aquifer, Northern New Mexico, ModelCARE 2002 Calibration and reliability in groundwater modelling: A few steps closer to reality, Prague, Czech Republic, Vol II, pp. 496-500. LAUR 02-726

Goal of Groundwater Pathways Assessment Project

Produce a report of model predictions (with uncertainties) of the concentration-time histories and plume locations for key contaminants in the regional aquifer and estimates of the likelihood that these contaminants will be detected in the R-well network and/or existing water supply wells within a specified time frame. Our report will also identify the most important conceptual models and parameters requiring further study to reduce uncertainties.

Groundwater Pathways Assessment – Major Steps

- Select contaminants of concern
- Document conceptual models
- Develop submodels used to predict the behavior (with uncertainties) of:
  - Contaminant source terms
  - Vadose zone contaminant transport
  - Regional aquifer contaminant transport
- Construct systems model linking the submodels
- Assign distributions for uncertain parameters
- Perform Monte Carlo simulations

Information Management Subcommittee Status Report

Hydrogeologic Characterization Program Annual Meeting
July 24, 2002

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Quarter in Review

1. Software Development
2. Updated Water Level Data
3. Updated Well Construction Data
4. ERDB/WQDB Chemistry Data Exchange
5. Integrated Groundwater Data Management

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Software Development

Chain of Custody Module

- Integrates with WQDB Sample Planning & Tracking Modules
- Generates Field Paperwork

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http://wqdbworld.lanl.gov

- Water Levels
  - New Data
- Well Construction
  - New Data
  - New Interface
- Chemistry
  - New Data

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Water Level Data

Location Name	From	To	Location Name	From	To
LADP-3	05/07/94	10/05/97	MCWB-7.4B	07/07/97	07/01/99
LAO-0.7	02/11/97	06/11/99	MCWB-7.7B	07/07/97	07/01/99
LAO-1	06/25/97	06/11/99	MCWB-7A	07/07/97	07/10/01
LAO-3	10/29/94	06/11/99	R-12	12/14/00	09/05/01
LAO-4	07/10/94	09/04/97	R-25	02/26/01	09/12/01
LAO-C	07/10/94	06/11/99	R-7	02/28/01	11/14/01
LAOI(A)-1.1	06/25/97	06/11/99	R-9i	03/01/01	09/05/01
MCO-5	10/31/92	12/01/93	Test Well 1	10/24/92	06/11/01
MCO-6	01/01/93	11/30/94	Test Well 1A	06/19/93	03/31/97
MCO-6B	10/31/92	11/30/94	Test Well 2	06/19/93	06/14/01
MCWB-5	01/31/96	05/30/01	Test Well 3	11/25/92	03/06/00
MCWB-5.5A	07/04/97	06/11/01	Test Well 4	06/19/93	04/25/00
MCWB-5.5B	07/03/99	06/11/01	Test Well 8	06/19/93	11/27/00
MCWB-6.2A	07/04/97	06/11/01	Test Well DT-10	06/19/93	05/10/99
MCWB-6.5C	07/04/97	06/11/01	Test Well DT-5A	06/19/93	08/11/96
MCWB-6.5E	07/04/97	06/11/01	Test Well DT-9	03/21/01	07/09/01
MCWB-7.4A	07/07/97	12/11/00	Test Well DT-9	11/25/92	05/10/99

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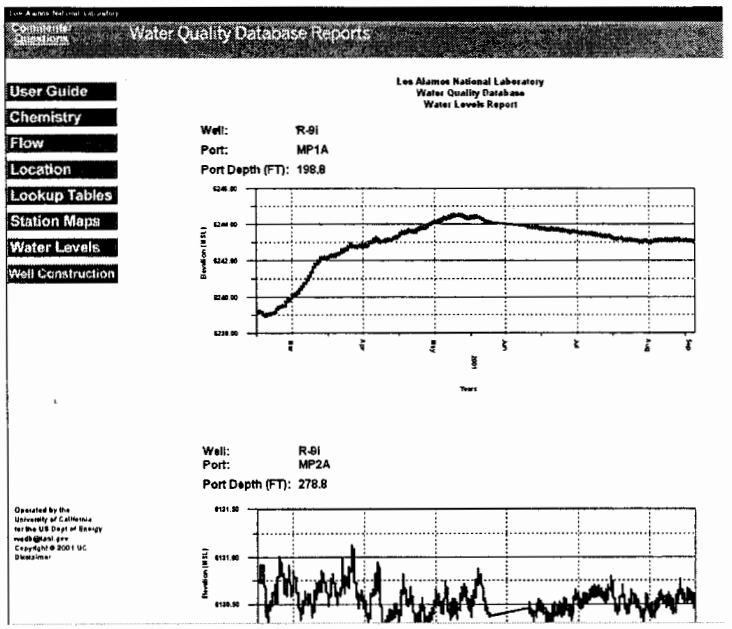
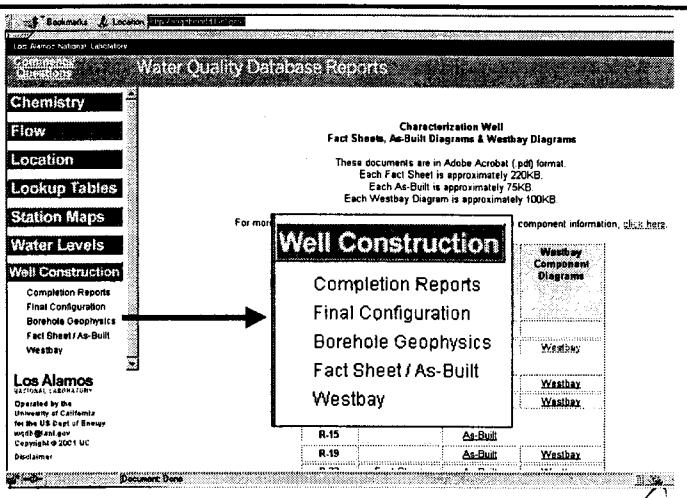


Well Construction



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Well Completion Reports

Characterization Well Completion Reports

These reports are in Adobe Acrobat (.pdf) format.
They are large files (approx. 2.5 megabytes), and may take several minutes to download.

Well R-7 Completion Report

Well R-9 Completion Report

Well R-9i Completion Report

Well R-12 Completion Report

Well R-15 Completion Report

Well R-19 Completion Report

Well R-22 Completion Report

Well R-25 Completion Report

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Final Configuration

Summary Well Construction Data for R-12

CLICK HERE FOR AS-BUILT DIAGRAM / FACT SHEET
CLICK HERE FOR WELL COMPLETION REPORT

Completion Type	Completion Depth	Screens	Ports	Packer Details	Casing Details	Annular Fill Details
MULTI	886 FT	3	15			

Surface Pad Install Date	Pad Length	Pad Width	Pad Thickness	Site Restoration Start Date	Site Restoration End Date
09-13-00	5 FT	5 FT	6 IN	07-19-00	09-22-00

Drilling Start Date	Drilling End Date	Well Development Start Date	Well Development End Date	Click for Geophysics Details
03-10-98	12-30-99	01-11-00	01-21-00	

Surface pad was installed with survey pin on 9/13/00. The site was restored after drilling on 7/19/00 and 7/20/00. The site was restored again after pad and vault on 9/21/00 and 9/22/00. The dates are from Mark Everett, MK, 505-662-1322, meverette@lanl.gov

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Borehole Geophysics

Borehole Geophysics

NOTE: these are LARGE files, and will take considerable time to download.

Well	Borehole Videos (.mpg format)	Geophysics Montages (Adobe Acrobat (.pdf) format)
R-7	Borehole Video (300 MB)	
R-19		Geophysics Montage (40 MB)
R-25	Borehole Video (577-863 ft.) (465 MB) Borehole Video (1175-1180 ft.) (14 MB) Borehole Video (1472-1482 ft.) (69 MB)	
R-31	Borehole Video (470 MB)	

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Fact Sheet, As-Built, Westbay

Well	Fact Sheets (drilling, stratigraphic and hydrologic information)	As-Builts	Westbay Component Diagrams
R-5	Fact Sheet		
R-7	Fact Sheet	As-Built	Westbay
R-9		As-Built	
R-9i		As-Built	Westbay
R-12	Fact Sheet	As-Built	Westbay
R-13	Fact Sheet		
R-15		As-Built	
R-19		As-Built	Westbay
R-22	Fact Sheet	As-Built	Westbay
R-25	Fact Sheet	As-Built	Westbay
MCOBT-4.4	Fact Sheet		
MCOBT-8.5	Fact Sheet		
CdV-R-153	Fact Sheet		
CdV-R-372	Fact Sheet		

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Chemistry Data

June 2002 WQDB/ERDB Exchange

WELL	FROM	TO
R-9	09/06/97	05/15/01
R-9i	09/14/00	09/06/01
R-12	09/18/00	09/11/01
R-15	02/24/00	05/22/01
R-19	09/22/00	09/24/01

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Looking Ahead

Integrated Groundwater Data Management

Single Database Repository for Drilling, Characterization & Surveillance Data

- Sample Planning & Tracking
- Well Construction
- Chemistry
- Geophysics

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Question & Answer

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Quarterly GIT Meeting

Well Construction Subcommittee Report

July 24, 2002

John McCann

Overview

- Drilling Accomplishments Last Quarter
- Current Drilling Activities
- Status of Quarterly Sampling Activities
- Status of Reporting Activities
- Drilling Project Work Scope

Drilling Accomplishments Last Quarter

- R-14
  - Started drilling operations on June 2
  - Coring completed June 4 - 306 feet
  - Regional aquifer static water level at 1180 feet
  - Drilling completed July 2 - TD 1325 feet
  - Well constructed with two screened intervals:
    - Screen 1 - 1200.6 to 1233.2 feet
    - Screen 2 - 1286.5 to 1293.1 feet

Drilling Accomplishments Last Quarter

- R-14 (cont)
  - Currently conducting well development task
  - Used stiff foam and bentonite-based mud drilling fluids on this well - learning curve
  - Encountered lost circulation, tried casing advance, decided to terminate boring at the 1325' depth (original target depth of 1664')

Current Drilling Activities

- Four wells to be installed by the end of the fiscal year, R-16, R-20, R-23, R-32
- DOE, using the Corps of Engineers, is scheduled to drill the R-21 Well by the end of the calendar year
- Next fiscal year's planning indicates a minimum of 6 wells planned

Status of Sampling Activity

- Screening samples collected at R-13 and MCOBT 4.4
- Sampling rounds were completed at the CdV wells, R-37-2 and R-15-3
- Initiated a sampling round of the 8 wells with 4 quarters of sampling complete: R-7, R9, R-9i, R-12, R-15, R-19, R-22 and R-25

Status of Reporting Activity

- Well Completion Report for R-7 was completed in April
- Two Geochemistry Reports were delivered in June for R-19 and R-12

Drilling Project Work Scope

1. Prepare SOW, SAP and evaluate contractor bids
2. Procure well materials such as steel and Westbay sampling systems
3. Prepare site-specific health and safety plans, and ESH-ID

Drilling Project Work Scope

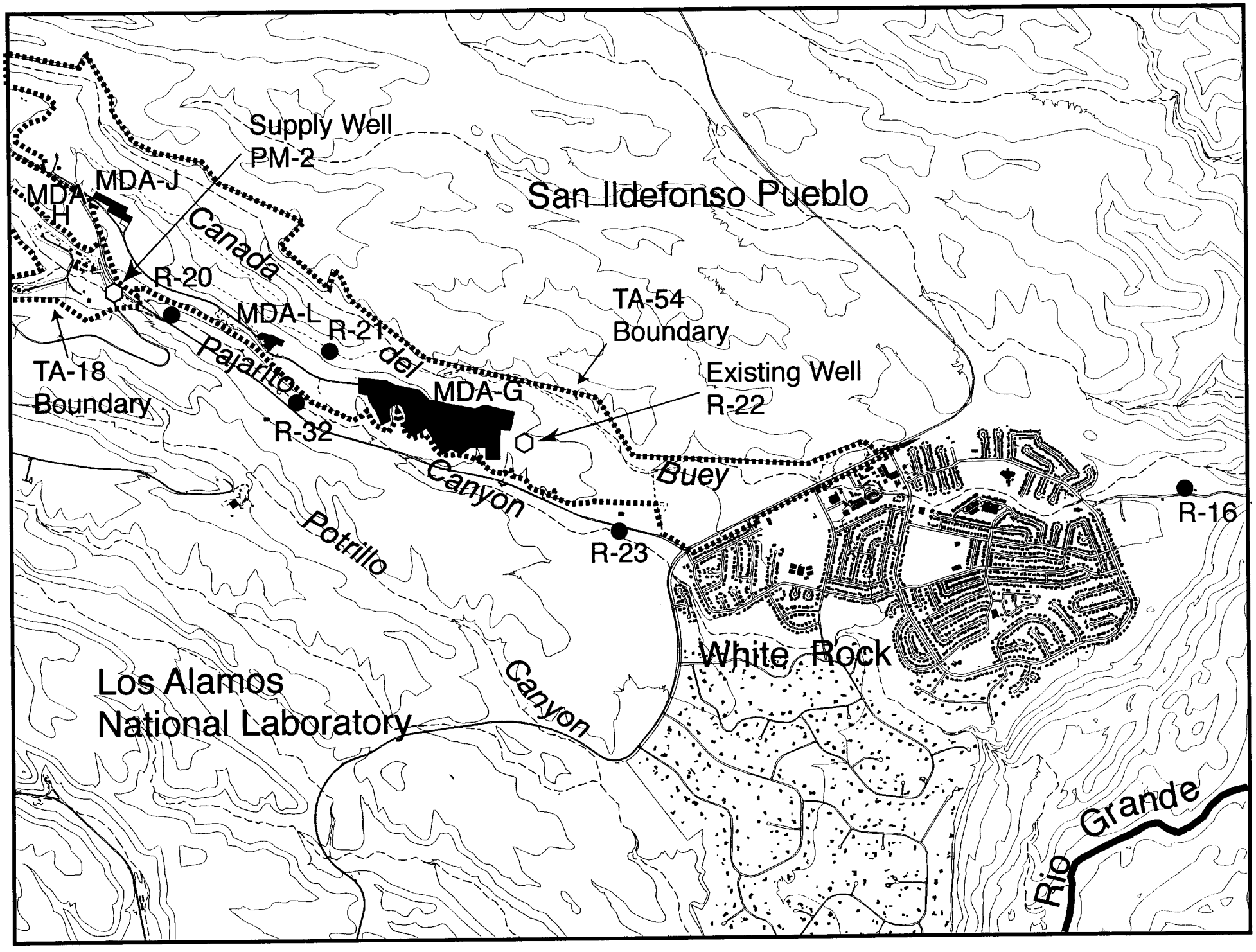
4. Complete planning, obtain permits, and conduct Readiness Review
5. Perform site access and pad preparation, mobilize drill rig and equipment to site
6. Conduct borehole drilling and obtain samples
7. Mobilize and perform geophysical logging

Drilling Project Work Scope

8. Construct well in borehole and backfill
9. Demobilize drill rig equipment
10. Perform well development with smaller rig
11. Perform hydrologic testing
12. Install Westbay sampling equipment

Drilling Project Work Scope

13. Perform well surface completion and site restoration
14. Prepare Fact Sheet
15. Perform borehole core and groundwater sample analyses
16. Prepare comprehensive Well Completion Report
17. Perform project management activities


Supply Well
PM-2
MDA-J
MDA-H
San Ildefonso Pueblo
Canada
R-20
MDA-L
R-21
del
TA-54
Boundary
Pajarito
TA-18
Boundary
MDA-G
Existing Well
R-22
R-32
Canyon
Buey
R-16
Potrillo
R-23
White Rock
Los Alamos
National Laboratory
Canyon
Rio Grande

Quarterly GIT Meeting

Well Construction Subcommittee Report

John McCann

January 30, 2002

Overview

- Drilling Accomplishments - Last Quarter
- Planned Drilling Activities
- Status of Quarterly Sampling Activities
- Status of Reporting Activities

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ENVIRONMENTAL RESTORATION PROJECT ER2002-0060 Los Alamos NATIONAL LABORATORY Slide 5

ENVIRONMENTAL RESTORATION PROJECT ER2002-0060 Los Alamos NATIONAL LABORATORY Slide 6

Planned Drilling Activities

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- R-18
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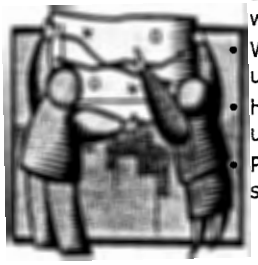
R-7	Aug 02
R-22	Sep 02

FY01 Groundwater Annual Status Report

Charlie Nylander
LANL/ESH-18
nylander@lanl.gov

Improvements



- Summarizes what we know so far
- What are the uncertainties
- How to reduce the uncertainties
- Proposes revised scope

Section 1

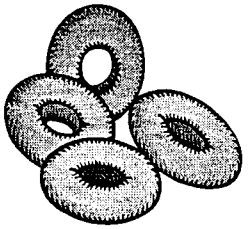
FY01 accomplishments all described in the same place
- Descriptions of wells completed
- Modeling activities
- Information management
- Reports

Section 4

Summarizes what is known and remaining uncertainties

- Overview of geology, vadose zone, regional aquifer, and geochemistry
- Relationship to the hydrogeologic conceptual model (Section 3)
- Uncertainties

Section 5



Updated bagel charts based on Section 4

- Status with respect to Hydrogeologic Workplan decisions
- Wells needed to reduce uncertainties
- Other activities modeling, testing

Value Engineering Study of the Hydrogeologic Characterization Program

Charlie Nylander
LANL/ESH-18
nylander@lanl.gov

Background

- DOE/AL requested the Value Engineering Study; authorized in April, 2001
- VE Team of 10 people from DOE and contractors at LANL April 30-May 4, 2001
- Objective: to provide recommendations to improve the Hydrogeologic Characterization Program.

Value Engineering

- Developed to capture informal process used to meet industrial demands during WWII
- Guidelines by Society of American Value Engineers (SAVE)
- Defines functions, determine costs of functions, recommends lower-cost functional alternatives

VE Project Strategy Recommendation 1

Prepare a comprehensive hydrogeologic report on the regional aquifer and initiate installation of a regional aquifer monitoring well network

Estimated Cost Savings: $10 million

VE Strategy Recommendation 1 Bases

- Simultaneous characterization of all water zones has increased scope and costs
- A comprehensive integrated report on the regional aquifer can tell a compelling story
- 6-12 more single completion monitoring wells are adequate
- Alluvial and intermediate zones investigated by ER Project associated with PRSs

LANL Preliminary Response to Strategy Recommendation 1

- Comprehensive characterization was the original scope, thus it can not "increase scope"
- A comprehensive integrated report is planned as a final deliverable for HWP
- Based on the DQO iteration, 15 more wells identified
- Working on an approach to quantitatively determine number of wells

VE Project Strategy Recommendation 2

Enhance project management to ensure deliverables are submitted on time and budget

Estimated Cost Savings: $152,000

VE Project Strategy Recommendation 2 Bases

- Hydrogeologic Characterization Program is not organized as a separate project within the ER baseline
- Could increased effectiveness with project organization based on work breakdown structure
- Project managers control scope, schedule, cost more easily

LANL Preliminary Response to Strategy Recommendation 2

- Agrees with recommendation to organize all aspects of hydrogeologic characterization program together in the baseline
- DOE has not provided funding for project management of the HWP activities

VE Data Collection and Analyses Recommendation 1

Reduce total number of regional aquifer wells to be drilled

Only 6-12 additional wells needed because regional aquifer sufficiently well known.

Estimated Cost Savings: $22.8 million

LANL Response: Developing quantitative tool for determining data collection needs

VE Data Collection and Analyses Recommendation 2

Drill all future wells to a single-completion

New wells will be for monitoring top of regional aquifer

Estimated cost savings: $19 million

LANL Response: Well completion based on DQOs for the well

VE Data Collection and Analyses Recommendation 3

Reduce the cost of groundwater chemistry analysis, through optimization of analytical parameters and sampling frequency, using lessons learned from wells already installed

Indicator parameters only for first 3 quarters; full suite for 4th quarter

Estimated cost savings: $360,000

LANL Response: Analytical strategy negotiated with NMED

VE Data Collection and Analyses Recommendation 4

Minimize the time the drilling rig is on-site

Too much time when full-size rig is on-site on standby

Estimated cost savings: $1.6 million

LANL Response: Agree. Adjustments are being made

VE Data Collection and Analyses Recommendation 5

Implement a competitively-bid, flexible, activity-based drilling contract

Other DOE sites have less expensive drilling contracts

Estimated cost savings: $1 million

LANL Response: Agree. Have awarded contract to WGI

VE Recommendation 1 Regarding NMED & Stakeholder Relationship

Improve stakeholder and regulator understanding by tailoring information for maximum information transfer

Develop a communication plan

Estimated Cost Savings: not estimated

LANL Response: HWP has communication plan

VE Recommendation 2 Regarding NMED & Stakeholder Relationship

Increase use of integrated information management and display system for stakeholder interaction

Easy access to data with geographical reference

Estimated Cost Savings: $500,000

LANL Response: Agree. WQDB is available and improving

VE Recommendation 3 Regarding NMED & Stakeholder Relationship

Use regional model to help communication of the site conceptual model

Include process for developing model, assumptions, input parameters

Estimated Cost Savings: not estimated

LANL Response: Agree. This has been done in meetings and reports

VE Recommendation 4 Regarding NMED & Stakeholder Relationship

Develop better understanding of how NMED defines success

A "win" is final regional aquifer monitoring system in place

Estimated Cost Savings: Not estimated

LANL Response: Agree. Management meetings intended reach agreement on "end state"

VE Recommendation 5 Regarding NMED & Stakeholder Relationship

Identify deliverables and schedules collaboratively with NMED

Make NMED full partner in planning work

Estimated Cost Savings: $1.16 million

LANL Response: Agreed. HWP activities have always had such a collaborative process

VE Recommendation 6 Regarding NMED & Stakeholder Relationship

Work with NMED to develop a set of indicator chemicals acceptable to both LANL and NMED

Use in place of full-suite analysis for first 3 quarters

Estimated Cost Savings: $395,200

LANL Response: Agreed. Analytical strategy negotiated with NMED

VE Recommendation 7 Regarding NMED & Stakeholder Relationship

Establish a Joint Working Group with NMED to prioritize data needs for compliance and risk

Work with NMED to specifically define data needs

Estimated Cost Savings: Not estimated

LANL Response: Agreed. Core team for quantitative approach proposed

VE Recommendation 8 Regarding NMED & Stakeholder Relationship

Improve and tailor reports on the results of characterization to be more "user friendly" both for NMED and stakeholder groups

Estimated Cost Savings: Not estimated

LANL Response: Agreed. Continuing to improve communication

VE Recommendation 9 Regarding NMED & Stakeholder Relationship

Develop a formal dispute resolution mechanism between LANL and NMED specifically dealing with the regional aquifer

Estimated Cost Savings: Not estimated

LANL Response: Agreed.

Next Steps

- LANL will submit formal comments on VE report by end of February
- Final report and LANL comments will be distributed to HWP distribution
- Any comments?

HYDROLOGY UPDATE

W. Stone

Quarterly Meeting, 30 Jan '02

Old Business

MCOBT-4.4

Additional development by bailing ineffective
Halted until dedicated pump installed
Pump being installed this week

R-13

Development was completed
Pumping test was conducted
Discharging 20 gpm barely stressed
Results being analyzed

R-22

Analysis of test data completed
Results are presented in well report

Database

Constructed field form for well development
Reviewed/advised on hydrologic modules

New Business

R-7

Well completion report is being prepared
Reviewing first draft now

Information Management Subcommittee Status Report

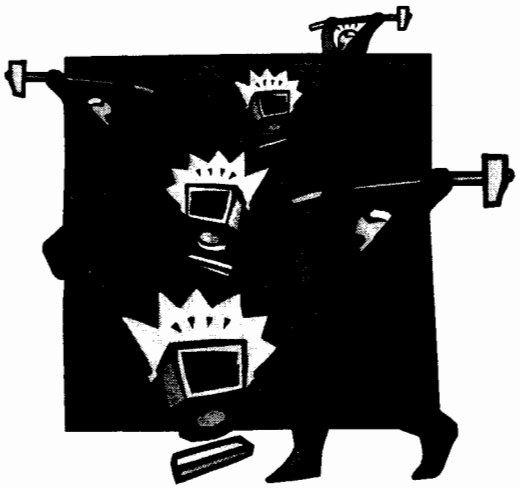
Hydrogeologic Characterization Program Quarterly Meeting
January 30, 2002

Quarter in Review

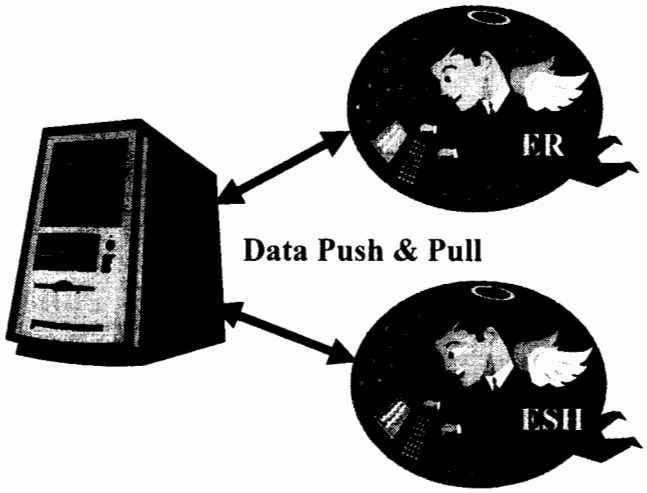
- Enhanced Sample Planning & Tracking System Features & Reports
- Water Level Module
- WQDB Website Enhancements
- Start of 2001 ESR Efforts
- ER/ESH Well Construction Data Exchange

ER/ESH Data Exchange

ER/ESH Data Exchange



ER/ESH Data Exchange



Looking Ahead

- More ERDB/WQDB Data Exchange (R-well Chemistry)
- Complete Water Level Module
- Develop Web-Based Validation Data Entry Tool
- Web-Based Data Screening Report
- GIS (dependent on funding)

Question & Answer

Quarterly GIT Meeting

Well Construction Subcommittee Report

John McCann

January 30, 2002

Overview

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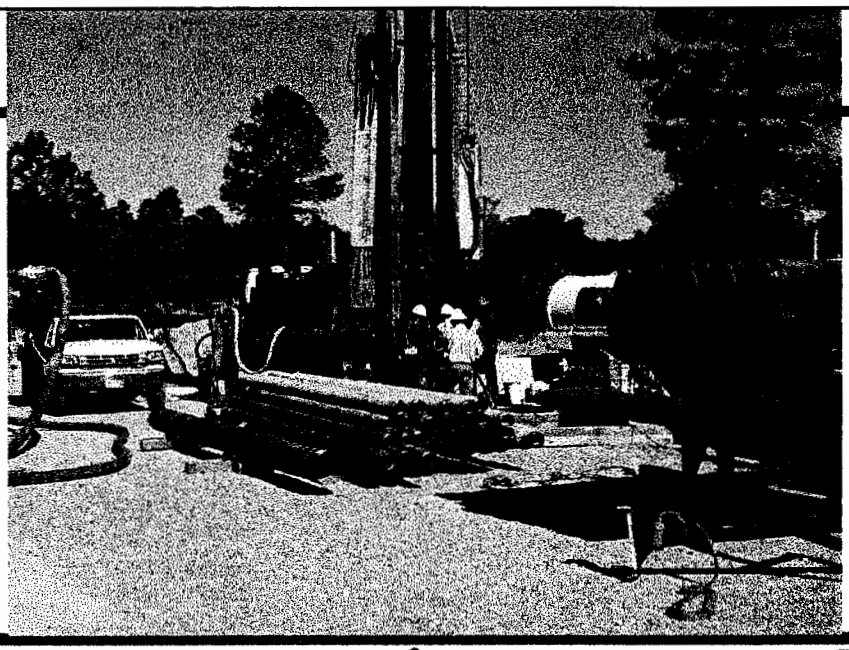

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Water Quality Database Website Demonstration

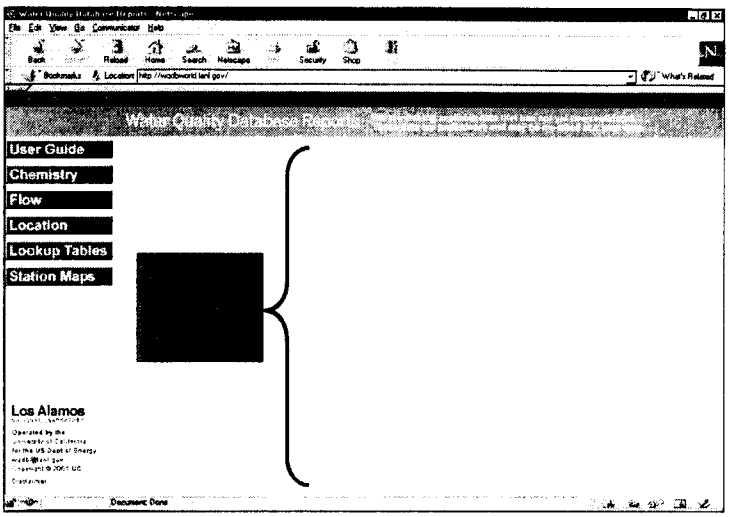
Hydrogeologic Characterization Program Quarterly Meeting
January 30, 2002

Overview

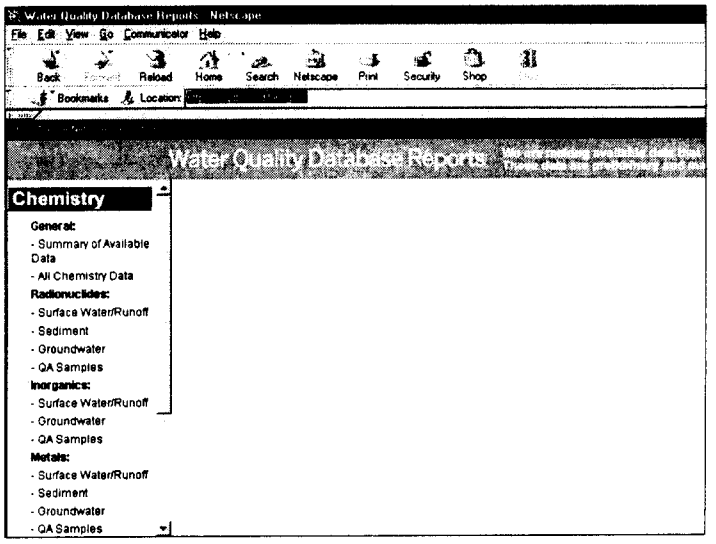
- How to get to the website
- How to Run a Report
- Report Output Options
- Tips & Tricks
- Q & A

Getting to the Website

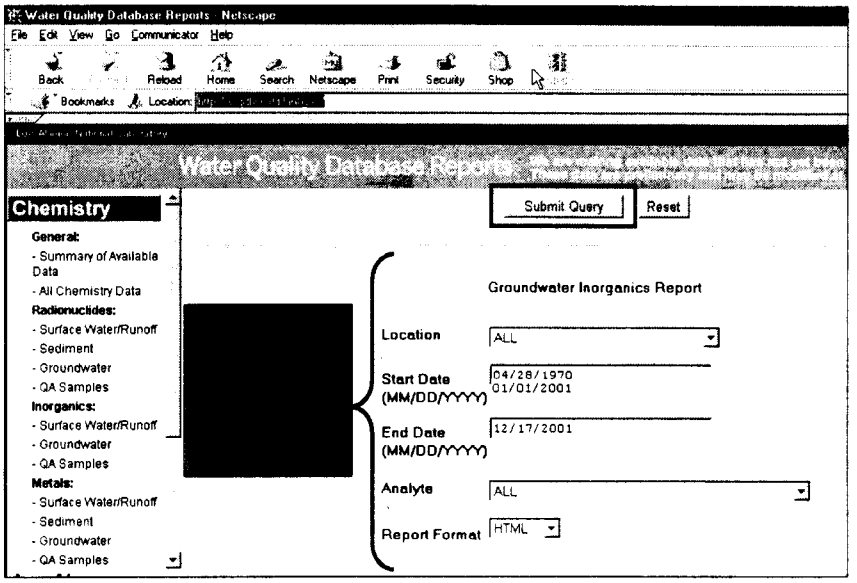
http://wqdbworld.lanl.gov



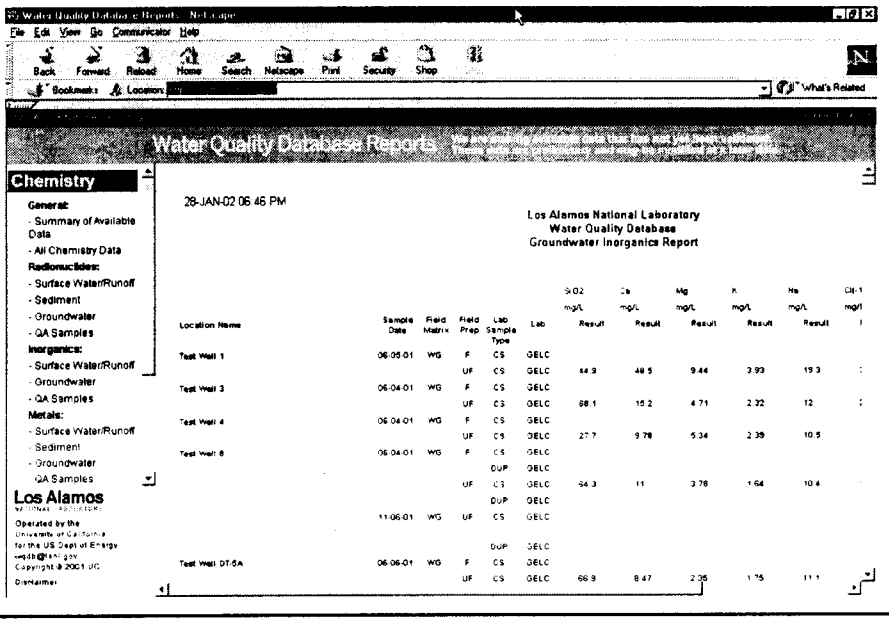
Step 1: Select a Report



Step 2: Complete Parameter Form & Submit Query

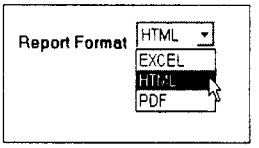


Step 3: Report Output (HTML Format)

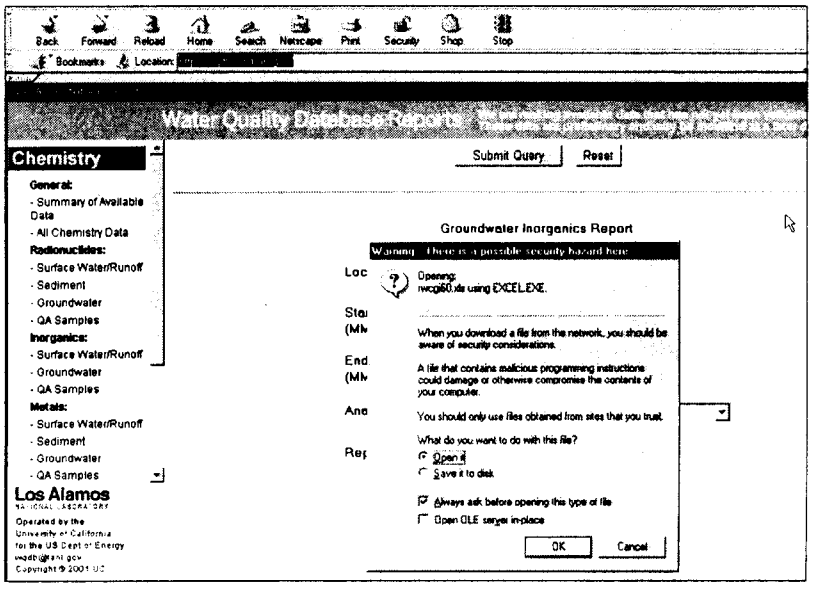


Report Format Options:

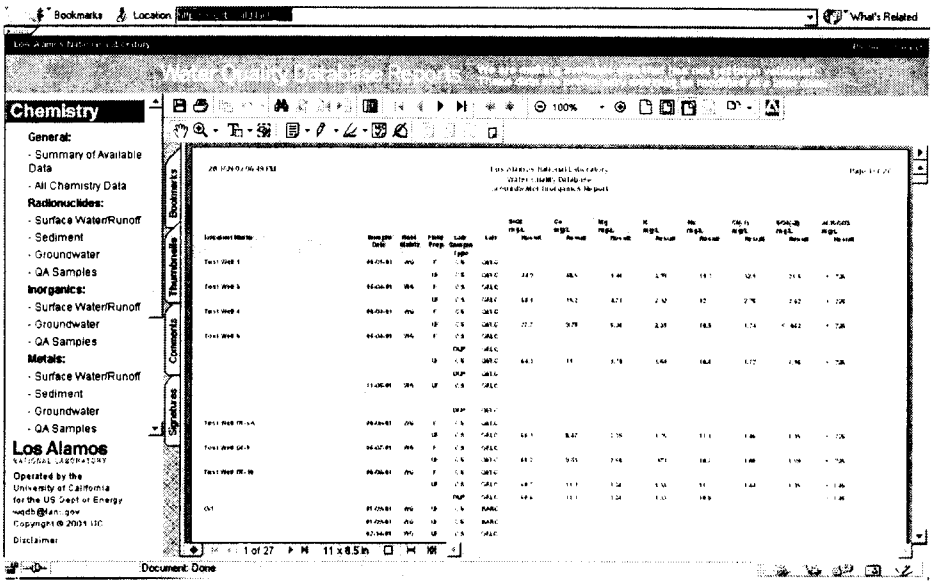
- **EXCEL** – Use when you wish to view or download an Excel file.
- **HTML** – Use to view the report on-screen (medium-quality formatting).
- **PDF** – Use to view the report on-screen (best formatting, but requires Adobe Acrobat Reader plug-in).



Excel Output Example



PDF Output Example



Tips & Tricks

- Restrict Your Queries
- Use the "Back" Button
- Data is Updated Approximately Every 2 Weeks
- Data Turnaround: approximately 60 days (Sample Collection → Website Availability)
- Data Are Preliminary
- Comments, Questions, Suggestions? khenning@lanl.gov

Question & Answer

Integrated Groundwater Protection Plan

Diana Hollis
January 30, 2002
GIT Quarterly Meeting

Los Alamos NATIONAL LABORATORY

Integrated Groundwater Protection Plan Update

- Goal: Protect groundwater users from known and potential contaminant releases *always*
- First step: Objectively evaluate existing groundwater monitoring program
- Second step: Identify alternative actions to optimize existing groundwater monitoring program
- Third step: Implement optimal actions and continuously iterate

Los Alamos NATIONAL LABORATORY

Integrated Groundwater Protection Plan

- Goal: *Protect* groundwater users from know and potential contaminant *always*
  - Follow EPA guidance to quantify "protect"
  - Assume two time-frames, first controlled access, then unrestricted access

Los Alamos NATIONAL LABORATORY

Integrated Groundwater Protection Plan

- First step: *Objectively* evaluate existing groundwater monitoring program
  - Quantify existing state of knowledge *and uncertainty* about sources and groundwater transport (all parameters)
  - Simulate contaminant transport via groundwater from sources to groundwater access points
  - Compare calculated concentrations with "protective limits" at access points
  - Determine if existing monitoring wells will detect contamination before protective limits are exceeded at access points
  - Define locations for additional wells if needed

Los Alamos NATIONAL LABORATORY

Integrated Groundwater Protection Plan

- Second step: Identify alternative actions to optimize existing groundwater monitoring program
  - Identify alternative activities (e.g., additional monitoring, additional characterization of geology, hydrology, contaminant source, and/or more realistic models) that could reduce the uncertainty in the direction and rate of potential contaminant plumes
  - Quantify reduction in uncertainties associated with alternative activities and combinations of activities
  - Compare cost of alternative actions with expected savings in monitoring

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Integrated Groundwater Protection Plan

- Third step: Implement optimal actions and continuously iterate
  - Complete "high return" actions (including monitoring)
  - Re-evaluate monitoring program to account for the results of completed actions
  - Optimize further activities and/or additional monitoring if required
  - Iterate every five years to incorporate changes in knowledge and changes in receptors and their locations

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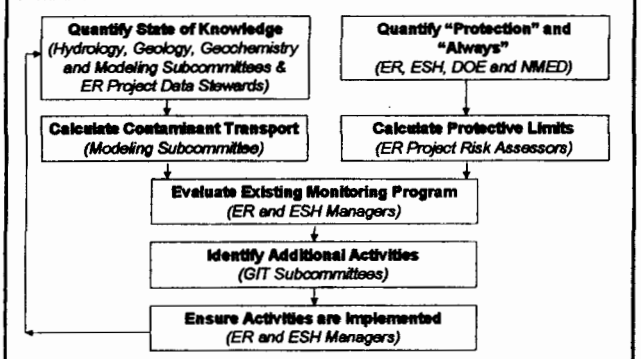
Integrated Groundwater Protection Plan



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