

Los Alamos

NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

ENTERED

Date: August 2, 2001
In Reply Refer To: ESH-18/WQ&H:01-234
Mail Stop: K497
Telephone: (505) 665-1859



HSWA LAWL G/M/HWP

Mr. John Young
Hazardous Materials Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Ms. Phyllis Bustamante
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

SUBJECT: NOTICE OF INTENT TO DISCHARGE, HYDROGEOLOGIC WORKPLAN WELLS

Dear Mr. Young and Ms. Bustamante:

Please find the enclosed Notice of Intent to Discharge (NOI) covering the discharge of drilling, development and sample purge water from the proposed regional aquifer wells described under Los Alamos National Laboratory's Hydrogeologic Workplan. This NOI is being submitted for your review and approval pursuant to Section 1201 of the New Mexico Water Quality Control Regulations. Since April, 1996, the Laboratory has submitted nine individual NOI's for each regional aquifer well constructed under the Workplan. As many as 23 additional regional aquifer wells have been proposed for construction over the next four years.

As an alternative to individual NOIs, the Laboratory is proposing that a single NOI be utilized for all discharges from regional aquifer wells constructed under the Workplan. It is the Laboratory's intent to improve coordination and administration of the NOI process for both the NMED and the Laboratory by eliminating the redundancy of individual NOIs for each well.

Thank you for your consideration of this request. Please call Bob Beers of the Laboratory's Water Quality and Hydrology Group at (505) 667-7969 if additional information would be helpful.

Sincerely,

A handwritten signature in cursive script that reads 'Steven Rae'.

Steven Rae,
Group Leader
Water Quality and Hydrology Group

SR:BB/tml



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Enclosures: a/s

Cy: B. Lucas, NMED/SWQB, Santa Fe, New Mexico, w/enc.
S. Yanicak, NMED/DOE/OB, w/enc., MS J993
J. Vozella, DOE/LAAO, w/enc., MS A316
M. Johansen, DOE/LAAO, w/enc., MS A316
D. McInroy, E-ER, w/enc., MS M992
R. Bohn, E-ER, w/enc., MS M992
D. Erickson, ESH-DO, w/enc., MS K491
L. McAtee, ESH-DO, w/enc., MK K491
C. Nylander, ESH-18, w/enc., MS K 497
M. Saladen, ESH-18, w/enc., MS K497
B. Beers, ESH-18, w/enc., MS K497
H. Decker, ESH-18, w/enc., MS K497
WQ&H File, w/enc., MS K497
IM-5, w/enc., MS A150

*Notice of Intent to Discharge
Los Alamos National Laboratory
Hydrogeologic Workplan*

NOTICE OF INTENT TO DISCHARGE
WATER PRODUCED DURING THE INSTALLATION AND MONITORING OF
HYDROGEOLOGIC WORKPLAN WELLS

Introduction

In March 1998, NMED approved a comprehensive hydrogeologic characterization work plan for Los Alamos National Laboratory (Laboratory). The Hydrogeologic Workplan (LANL 1998) proposes a multiyear drilling and hydrogeologic analysis program to characterize the Pajarito Plateau and to assess the potential for groundwater contamination from waste disposal operations. The goal of the project is to develop greater understanding of the geology, groundwater flow, and geochemistry beneath the 43-square-mile Laboratory area and to assess any impacts that Laboratory activities may have had on groundwater quality. The Hydrogeologic Workplan (Workplan) will result in an enhanced understanding of the Laboratory's groundwater setting and an improved ability to ensure adequate groundwater monitoring. The centerpiece of the Workplan is the proposed installation of as many as 32 regional aquifer wells.

Beginning with well R-9 in April 1996, the Laboratory has submitted a Notice of Intent to Discharge (NOI) for each Workplan well prior to installation. Table 1.0 below presents a summary of the wells completed to date, the date that the NOI was submitted for each well, and the ESH-18 file number for each respective NOI.

Table 1.0. Completed Hydrogeologic Workplan Wells.

Well Name	Completion Date	Watershed	Type of Well	Date of NOI	NOI File No.
R-25	Feb-99	Water/Valle	regional	7/7/98	98-0227
R-9	Sept-99	LA/Pueblo	regional	4/3/96	96-0189
R-15	Sept-99	Mortandad	regional	6/25/99	99-0245
R-12	Jan-00	Sandia	regional	3/27/98	98-0106
R-31	Feb-00	Ancho	regional	5/18/99	99-0165
R-19	Mar-00	Pajarito	regional	1/25/00	00-0019
R-22	Dec-00	Pajarito	regional	12/12/00	00-0412
R-7	Mar-01	LA/Pueblo	regional	2/29/00	00-0063
R-5	June-01	Pueblo	regional	4/10/01	01-0112

For the remaining Workplan wells, the Laboratory proposes to utilize a single, Generic NOI. That is, in lieu of submitting individuals NOIs for each well, as was previously conducted, this NOI is being submitted to comprehensively cover all discharges from regional aquifer wells constructed under the Workplan. It is currently estimated that R-well construction will be completed by 2005.

Notice of Intent to Discharge
Los Alamos National Laboratory
Hydrogeologic Workplan

1. **Name and address of facility making the discharge.**
Los Alamos National Laboratory
P.O. Box 1663
Los Alamos, New Mexico 87545

2. **Location of the discharge.**
See attached Map 1.0 for the location of all completed and proposed Hydrogeologic Workplan (Workplan) wells. As prescribed in Standard Operating Procedure (SOP) 2.01, *Surface Water Assessment/Erosion Matrix*, the land application area will be located on the generally flat canyon bottom outside of the active channel. An assessment will be conducted at each proposed land application site prior to discharge.

3. **The means of discharge. (to Lagoon, Flowing stream, Water course, Arroyo, Septic tank, other).**
All water produced during the drilling and development of Workplan wells will be containerized, sampled, and evaluated for compliance with NM WQCC Regulation 3103 ground water standards before any discharge occurs. See attached Figure 1.0, *Workplan NOI Decision Tree*, for further information on the sequence of activities conducted prior to a discharge of water to the environment.

Once it has been confirmed by the ER Project and ESH-18 that the containerized water is compliant with NM WQCC Regulation 3103 ground water standards then the water will be either (1) applied to the surface of the land in the vicinity of the well, or (2) applied to the well site or access roads for dust suppression. Land application will be conducted using the following means:

1. Aluminum piping with sprinkler heads will serve as the conduit for the discharge. A typical installation will consist of two separate piping runs, each approximately 250 feet long with 5 sprinkler heads on each run. Piping runs will be situated to prevent any overlap of spray. Sprinkler heads will be adjusted to maximize evaporation.

2. Each sprinkler head has a discharge rate of approximately 16 gallons per minute; ten sprinkler heads will discharge approximately 160 gallons per minute. Therefore, a typical system would have a design capacity of approximately 9,600 gallons per hour, weather and soil conditions permitting.

3. Land application will be conducted for 8 to 10 hours a day. The discharge will be monitored routinely during the hours of operation to (1) ensure that no ponding or run-off is occurring, (2) to inspect any BMP's installed on the application site, and (3) to inspect for leaks in the system or malfunctioning sprinkler heads.

4. If at any time the land application site shows signs of ponding or run-off, all discharge operations will be immediately halted. The site will be evaluated for the need of any additional BMP's and the discharge will not start again until the site has returned to an appropriate condition (i.e., no standing water or visible run-off).

***Notice of Intent to Discharge
Los Alamos National Laboratory
Hydrogeologic Workplan***

The alternative method of land application is for dust suppression at the drilling site and on access roads serving the drilling site. A water truck will apply water used for dust suppression. A second alternate means of disposal would be discharge to one of the Laboratory's three wastewater treatment facilities (High Explosive Wastewater Treatment Facility, Sanitary Wastewater Systems Facility, Radioactive Liquid Wastewater Treatment Facility) if the quality of the water meets the treatment facility's Waste Acceptance Criteria (WAC) and the treatment facility has adequate capacity available.

4. The estimated concentration of contaminants (if any) in the discharge.

The concentrations of contaminants in the discharge are expected to be equivalent to the concentrations of contaminants in the aquifer(s) penetrated during installation of the borehole. The quality of groundwater beneath the Laboratory is characterized and documented annually in the Laboratory's *Environmental Surveillance Report*. The *Environmental Surveillance Report* for 1999 is available on the World Wide Web at the following address: <http://lib-www.lanl.gov/pubs/la-13775.htm>. The *Environmental Surveillance Report* for 2000 is scheduled for release in October 2001.

In addition to the extensive characterization data available from the annual *Environmental Surveillance Reports*, each new Workplan well will also be sampled for specific contaminants of concern. Analyte lists will be prepared on a well-by-well basis. As identified in Figure 1.0, these results will be used to determine compliance with NM WQCC Regulation 3103 ground water standards prior to the commencement of land application. Analytical results will be submitted to the NMED as soon as they are available for release.

5. The type of operation from which the discharge is derived

All of the wells referenced in this NOI are part of the Hydrogeologic Characterization Program undertaken by Los Alamos National Laboratory in order to better understand the geologic and hydrologic characteristics of the regional aquifer, intermediate perched zones, and intercalated unsaturated zones at the Laboratory. The discharges from each well are produced from the following three sources:

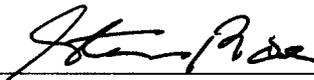
1. **Drilling Water.** During well drilling, water is produced from two sources:
 - Small quantities of drilling additives (e.g., EZ Mud™, Quick Foam™) are mixed with potable water and used during the drilling process to improve efficiency. Material Safety Data Sheets (MSDS) are available for these products upon request.
 - Groundwater (alluvial, intermediate, and regional) encountered as the borehole penetrates water-bearing strata.

Between 20,000 and 125,000 gallons of drilling water will be produced during the drilling of each Workplan regional aquifer well.

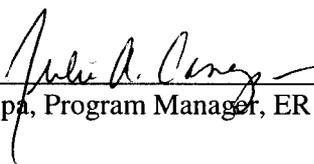
Notice of Intent to Discharge
Los Alamos National Laboratory
Hydrogeologic Workplan

In addition to above drilling additives, there is the possibility that drilling mud may be used in the construction of certain Workplan wells. Drilling mud, such as Quick-Gel™, is commonly used during the drilling of wells to: (1) lift cuttings out of the hole, (2) cool the drill bit, and (3) support the walls of the borehole in unconsolidated formations. Drilling fluids containing drilling mud will be isolated in a designated holding tank where the solids will be settled and the water can be decanted. Settled solids will be disposed of at an approved disposal site. Decanted water will be sampled and land applied if compliant with NM WQCC Regulation 3103. Ground Water Standards.

2. **Development Water.** Following well construction, the well is developed to remove any fine material that may be blocking the wells screens or ports. This water is essentially ground water with the potential for small, deminimus, quantities of drilling additives. Between 20,000 and 125,000 gallons of well development water will be produced during the drilling of each Workplan regional aquifer well.
3. **Sampling Purge Water.** Once well construction is complete, each well will be routinely sampled. During sample collection it is necessary to purge the well prior to collecting a sample to ensure that the water sampled is representative of the ground water in the aquifer. Between 100 and 1,500 gallons of water will be produced during each sampling event. Since the volumes of sampling purge water are small and the source is exclusively ground water, it will be directly discharged to the land surface without sampling or containerization. In addition, no sprinkler system will be used during the discharge of sampling purge water. All discharges will be directed away from any surface water.
6. **The estimated flow to be discharged per day.**
The daily discharge volumes from the land application of drilling and well development water are estimated to be as much as 96,000 gallons per day. Routine well sampling is expected to generate as much as 1,500 gallons of purge water per sampling event. Daily discharge volumes are dependent on the capacity of the soil, weather conditions, and equipment considerations.
7. **The estimated depth to Groundwater.** Depth to the regional aquifer varies from 700 to 1200 feet.

Signed: 
Steven Rae, Group Leader, ESH-18

Date: Aug 2, 2001

Signed: 
Julie Canepa, Program Manager, ER Project

Date: 8/2/01

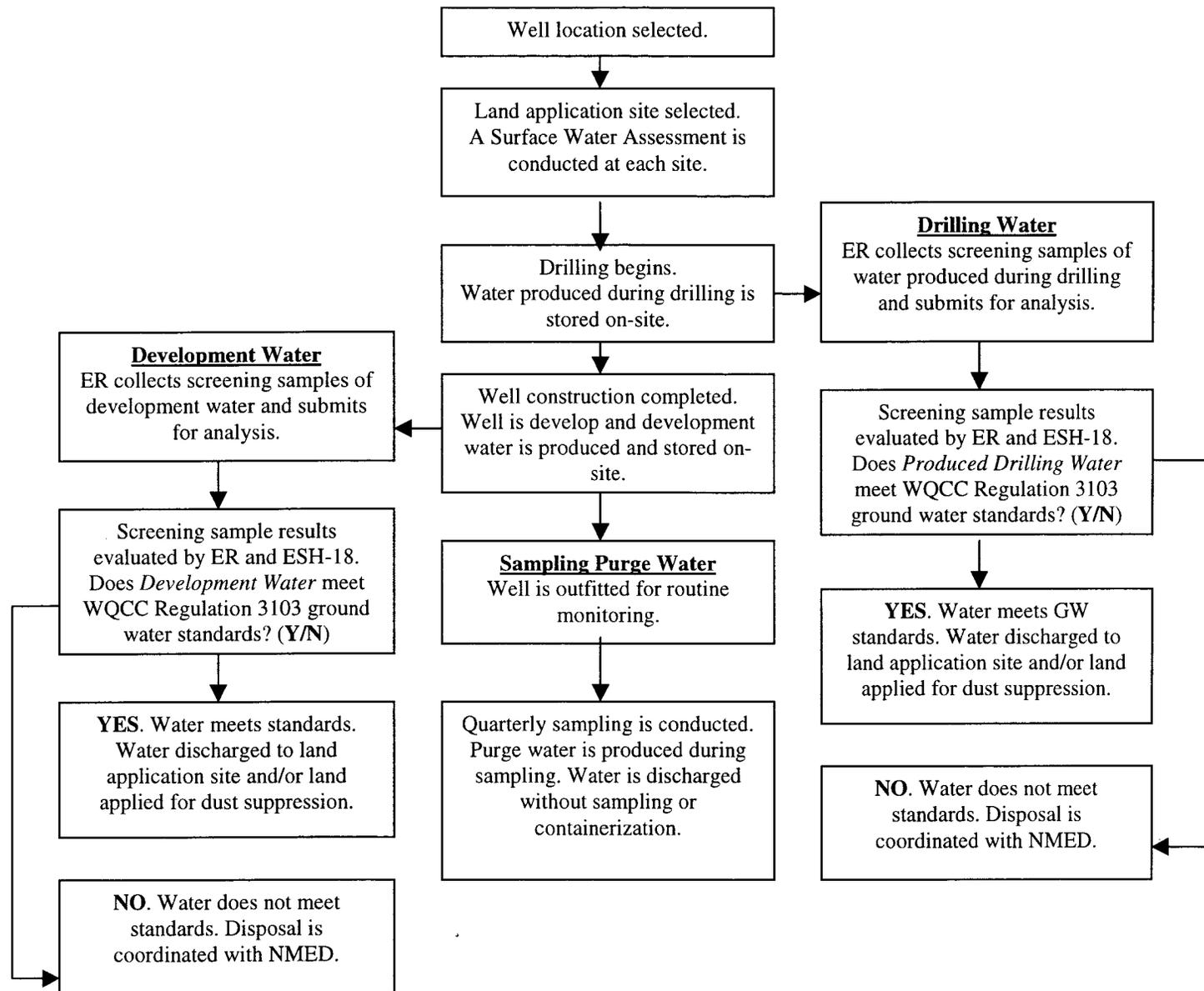


Figure 1.0. Workplan NOI Decision Tree

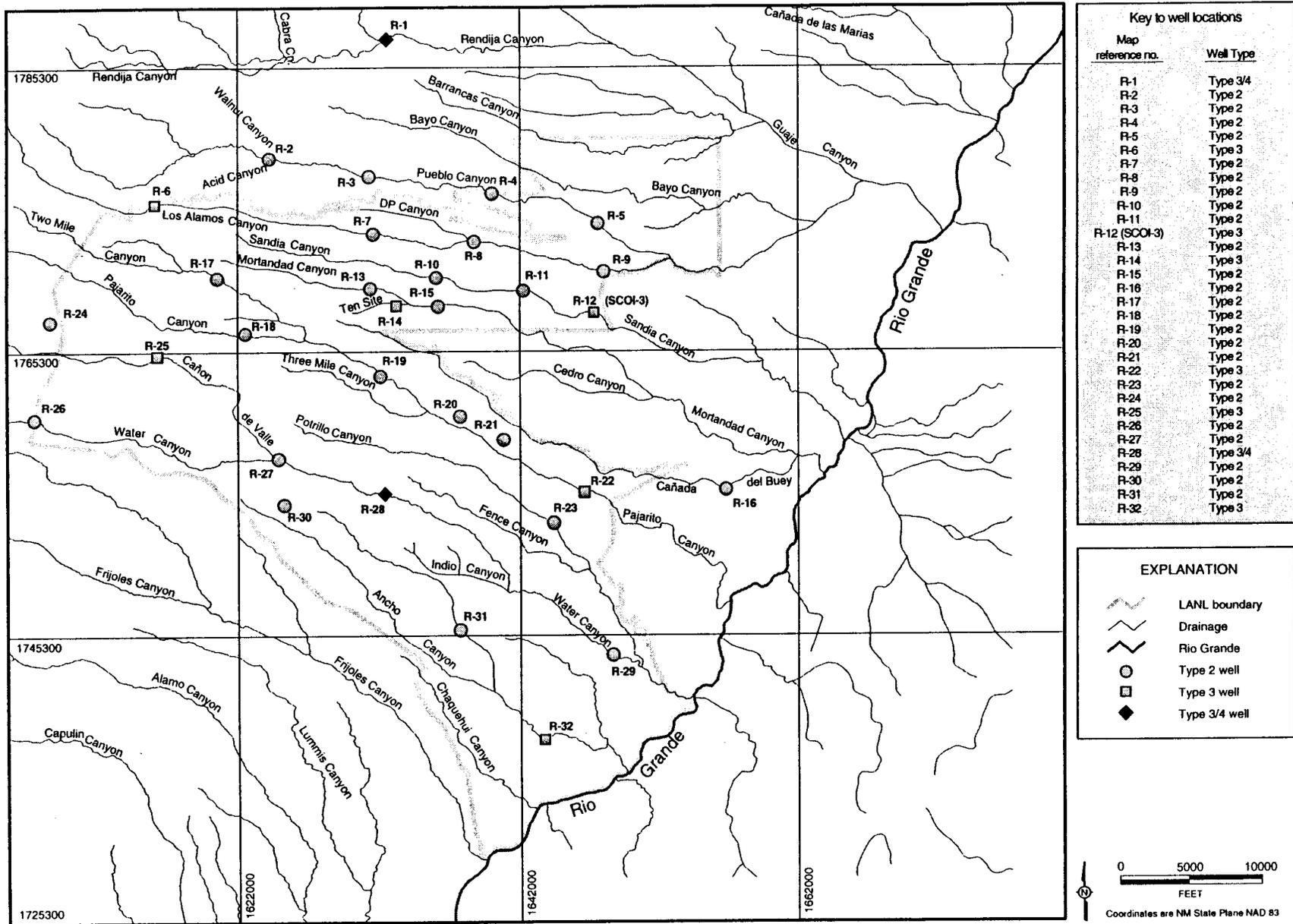


Figure 4-2. Proposed regional aquifer well locations.