

Los Alamos

NATIONAL LABORATORY

*Los Alamos National Laboratory
Los Alamos, New Mexico 87545*

Date: October 31, 2000
In Reply Refer To: ESH-18/WQ&H:00-0371
Mail Stop: K497
Telephone: (505) 665-1859

Mr. Roger C. Anderson
Environmental Bureau Chief
Oil Conservation Division
New Mexico Energy, Minerals and Natural Resources Department
2042 South Pacheco Street
Santa Fe, New Mexico 87505

SUBJECT: DISCHARGE PLAN GW-031 RENEWAL, FENTON HILL GEOTHERMAL FACILITY, SANDOVAL COUNTY, NEW MEXICO

Dear Mr. Anderson:

The Laboratory is in receipt of your October 13, 2000, letter conditionally approving the ground water discharge plan renewal application for the Fenton Hill Geothermal Facility GW-031. Enclosed, please find a signed copy of your approval letter and, as required by regulation, a check in the amount of \$690.00 for the renewal of discharge plan GW-031.

In addition, please find the enclosed Storm Water Pollution Prevention Plan (SWPPP) for the Fenton Hill Geothermal Facility. The SWPPP has been prepared by the Laboratory in order to satisfy condition number 26 of the discharge plan approval conditions issued by your agency. The SWPPP addresses the run-off of storm water from the facility.

Under condition number 22 of the discharge plan approval conditions, the Laboratory is required to submit a closure or operating plan for each of the two land application units at the facility. As discussed during the October 13, 2000, meeting at your Santa Fe office with Bob Beers of the Laboratory's Water Quality and Hydrology Group, the Laboratory does not anticipate using either of these land application units during the next renewal period (June, 2000 to June, 2005). Therefore, the Laboratory requests closure of both land application units at this time.

In 1995, your division conditionally approved the land application of approximately 3.7 million gallons of water to approximately 22 acres of U.S. Forest Service land located southwest of the facility. The Laboratory discharged to this land application unit from May to October, 1995. No discharges have been made to this land application unit since 1995. In accordance with the conditions set forth in your approval letter (William J. LeMay, OCD, to Steven R. Rae, LANL, April 10, 1995), the Laboratory collected soil samples from this land application site and down gradient locations for five years (1995-1999) following land application activities. In October, 1999, the Laboratory reported to your division the analytical results from the five-year monitoring project (ESH-18/WQ&H:99-0395). Monitoring results show that concentrations of arsenic, the

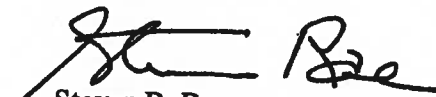
October 31, 2000

principal contaminant-of-concern, at the land application site and at down-gradient locations were consistent with pre-application and background levels. In conclusion, monitoring of this land application unit has been completed and the Laboratory does not anticipate discharging to this unit during the next renewal period; and therefore, we request closure of the southwest land application unit.

The second land application unit at the facility was conditionally approved by your division by letter in April, 1998 (Roger C. Anderson, OCD, to Steven R. Rae, LANL, April 23, 1998). Approximately 2.5 million gallons of water from the Milagro Project's 5-million gallon pond was land applied from April to June, 1998, to approximately 7 acres of U. S. Forest Service land located on the northern boundary of the facility. No land application activities have been conducted at this land application unit since June, 1998. All water applied to this land application unit came from the Milagro Project's astrophysical observatory pond. Milagro Project water originates from the Fenton Hill domestic water supply well and is then purified through filtration and ion exchange processes. Due to the high quality of the land-applied water, no contaminants of concern were identified and no post-application monitoring was required by your division. In conclusion, the Laboratory does not anticipate discharging to this unit during the next renewal period; and therefore, we request closure of the north land application unit.

Please contact me at 505-665-1859 or Bob Beers at 505-667-7969, if you have any questions or concerns regarding this submittal. On behalf of the Laboratory, I would like to thank you and your staff for your assistance during the discharge plan renewal process.

Sincerely,



Steven R. Rae
Group Leader
Water Quality and Hydrology Group

SR/rm

Enclosures: a/s

Cy: J. Peterson, District Ranger, Jemez Ranger District, Jemez Springs, New Mexico, w/enc.
D. Duffy, Pueblo of Jemez Springs, Jemez Springs, New Mexico, w/enc.
J. Parker, NMED DOE/OB, Santa Fe, New Mexico, w/enc.
D. Gurule, DOE/LAAO, w/enc., MS A316
J. Vozella, DOE/LAAO, w/enc., MS A316
M. Johansen, DOE/LAAO, w/enc., MS A316
T. Gunderson, DLDOPS, w/enc., MS A100
D. Erickson, ESH-DO, w/enc., MS K491
L. McAtee, ESH-DO, w/enc., MS K491

Cy (continued):

B. Beers, ESH-18, w/enc., MS K497
M. Saladen, ESH-18, w/enc., MS K497
M. Alexander, ESH-18, w/enc., MS K497
B. Grimes, CRO-1, w/enc., MS A117
D. Thomas, P-FM, w/enc., MS D459
J. Albright, EES-4, w/enc., MS D443
J. Thomson, EES-4, w/enc., MS D443
G. Sinnis, P-23, w/enc., MS H803
WQ&H File, w/enc., MS K497
CIC-10, w/enc., MS A150



NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
Jennifer A. Salisbury
Cabinet Secretary

October 13, 2000

Lori Wrotenberg
Director
Oil Conservation Division

CERTIFIED MAIL

RETURN RECEIPT Hand Delivered:

Mr. Steven R. Rae
Los Alamos National Laboratory
MS K497
Los Alamos, New Mexico 87545

Re: Discharge Plan GW-031 Renewal
Fenton Hill Geothermal Facility
Sandoval County, New Mexico

Dear Mr. Rae:

The groundwater discharge plan renewal application for the Los Alamos National Laboratory Fenton Hill Geothermal Facility GW-031 operated by Los Alamos National Laboratory located in NE/4 of Section 13, Township 19 North, Range 2 East, NMPM, Sandoval County, New Mexico is hereby approved under the conditions contained in the enclosed attachment. Enclosed are two copies of the conditions of approval. Please sign and return one copy to the New Mexico Oil Conservation Division (OCD) Santa Fe Office within ten working days of receipt of this letter.

The original discharge plan was approved on June 5, 1985 and subsequently renewed on July 19, 1990, June 15, 1995 and modification approved on May 10, 1999. The discharge plan renewal application, including attachments, dated February 02, 2000 submitted pursuant to Section 5101.B.3. of the New Mexico Water Quality Control Commission (WQCC) Regulations also includes all earlier applications and all conditions later placed on those approvals. The discharge plan renewal application was submitted pursuant to Section 5101.B.3. of the New Mexico Water Quality Control Commission (WQCC) Regulations. The discharge plan is renewed pursuant to Section 5101.A. and 3109.C. Please note Section 3109.G., which provides for possible future amendment of the plan. Please be advised that approval of this plan does not relieve Los Alamos National Laboratory of liability should operations result in pollution of surface or ground waters, or the environment.

Mr. Steven R. Rae

10/13/00

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Please note that Section 3104. of the regulations requires that "when a plan has been approved, discharges must be consistent with the terms and conditions of the plan." Pursuant to Section 3107.C., Los Alamos National Laboratory is required to notify the Director of any facility expansion, production increase, or process modification that would result in any change in the discharge of water quality or volume.

Pursuant to Section 3109.H.4., this approval is for a period of five years. This approval will expire June 05, 2005 and an application for renewal should be submitted in ample time before that date. Pursuant to Section 5101.F. of the regulations, if a discharger submits a discharge plan renewal application at least 120 days before the discharge plan expires and is in compliance with the approved plan, then the existing discharge plan will not expire until the application for renewal has been approved or disapproved. It should be noted that all discharge plan facilities will be required to submit plans for, or the results of, an underground drainage testing program as a requirement for discharge plan renewal.

The discharge plan application for the Los Alamos National Laboratory Fenton Hill Geothermal Facility is subject to the WQCC Regulation 3114. Every billable facility submitting a discharge plan will be assessed a fee equal to the filing fee of \$50 plus a renewal fee of \$690.00 for geothermal facilities. The OCD has not received the \$690.00 flat fee. The flat fee of \$690.00 may be paid in a single payment due on the date of the discharge plan approval or in five equal installments over the expected duration of the discharge plan. Installment payments shall be remitted yearly, with the first installment due on the date of the discharge plan approval and subsequent installments due on this date of each calendar year.

Please make all checks payable to: Water Quality Management Fund
C/O: Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505

If you have any questions, please contact Wayne Price of my staff at (505-827-7155). On behalf of the staff of the OCD, I wish to thank you and your staff for your cooperation during this discharge plan review.

Sincerely,



Roger C. Anderson
Environmental Bureau Chief
RCA/lwp

Attachment-1

xc: OCD Aztec Office
OCD District IV -Roy Johnson

**ATTACHMENT TO THE DISCHARGE PLAN GW-031 APPROVAL
Los Alamos National Laboratory Fenton Hill Geothermal Facility (GW-031)
DISCHARGE PLAN APPROVAL CONDITIONS
October 13, 2000**

1. **Payment of Discharge Plan Fees:** The \$50.00 filing fee has been received by OCD. The \$690.00 flat fee shall be submitted upon receipt of this approval. The required flat fee may be paid in a single payment due at the time of approval, or in equal annual installments over the duration of the plan, with the first payment due upon receipt of this approval.
2. **Commitments:** Los Alamos National Laboratory will abide by all commitments submitted in the discharge plan renewal application dated February 02, 2000 and these conditions for approval.
3. **1-Millon and 5-Millon Gallon Ponds:** A minimum freeboard will be maintained in the pond so that no over topping occurs. Any repairs or modifications to the pond liners must receive prior OCD approval. If the pond liners are replaced or a new pond is constructed, a double synthetic liner with leak detection will be incorporated into the design. Leaks and releases shall be reported pursuant to item 19. (Spill Reporting) of these conditions.

Leak Detection Monitor Well: The leak detection monitor well for the 1-Millon Gallon storage pond must be inspected for fluids monthly. Records will be maintained to include fluid level in the detection well, quantity of fluid pumped from the well when the level has risen due to precipitation, date of inspection, and name of inspector. Any fluids found which cannot be attributed to the infiltration of precipitation must be reported to the NMOCD Santa Fe office and the appropriate District office within 48 hours of discovery.

The 5-Millon Gallon Pond leak detection system does not require monitoring due to the quality of the water in the pond. Los Alamos National Laboratory shall notify the OCD within 48 hours if the water quality changes significantly that would pose a threat to any fresh water if a release should occur.

4. **Injection Notification:** Any injection of fluids into the well bore shall be pre-approved by OCD on a case-by-case basis.
5. **Maximum Injection Pressure:** The maximum operating injection and/or test pressure at the well head will be such that the fracture pressure of the injection formation will not be exceeded.

6. Mechanical Integrity Testing: Los Alamos National Laboratory will conduct a monthly survey on the well head pressure. Any deviation of more than 50 psig shall be reported to OCD within 48 hours. Records shall be maintained on file. The results of the survey shall be reported to the OCD in the annual report due on January 31, of each year.
7. Drum Storage: All drums containing materials other than fresh water must be stored on an impermeable pad with curbing. All empty drums should be stored on their sides with the bungs in place and lined up on a horizontal plane. Chemicals in other containers such as sacks or buckets must also be stored on an impermeable pad with curbing.
8. Process Areas: All process and maintenance areas which show evidence that leaks and spills are reaching the ground surface must be either paved and curbed or have some type of spill collection device incorporated into the design.
11. Above Ground Tanks: All above ground tanks which contain fluids other than fresh water must be bermed to contain a volume of one-third more than the total volume of the largest tank or of all interconnected tanks. All new facilities or modifications to existing facilities must place the tank on an impermeable type pad within the berm.
12. Above Ground Saddle Tanks: Above ground saddle tanks must have impermeable pad and curb type containment unless they contain fresh water or fluids that are gases at atmospheric temperature and pressure.
13. Labeling: All tanks, drums, and other containers should be clearly labeled to identify their contents and other emergency information necessary if the tank were to rupture, spill, or ignite.
14. Below Grade Tanks/Sumps: All below grade tanks, sumps, and pits must be approved by the OCD prior to installation or upon modification and must incorporate secondary containment and leak-detection into the design. All pre-existing sumps and below-grade tanks must be tested to demonstrate their mechanical integrity no later than **June 01, 2000** and every year from tested date, thereafter. Permittees may propose various methods for testing such as pressure testing to 3 pounds per square inch above normal operating pressure and/or visual inspection of cleaned out tanks and/or sumps, or other OCD approved methods. The OCD will be notified at least 72 hours prior to all testing. The test results will be submitted to OCD in the annual report.
15. Underground Process/Wastewater Lines: All underground process/wastewater pipelines must be tested to demonstrate their mechanical integrity no later than **June 01, 2000** and

every 5 years, from tested date, thereafter. Permittees may propose various methods for testing such as pressure testing to 3 pounds per square inch above normal operating pressure or other means acceptable to the OCD. The OCD will be notified at least 72 hours prior to all testing. The test results will be submitted to OCD in the annual report.

16. Class V Wells: No Class V wells that inject non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes will be approved for construction and/or operation unless it can be demonstrated that groundwater will not be impacted in the reasonably foreseeable future. Leach fields and other wastewater disposal systems at OCD regulated facilities which inject non-hazardous fluid into or above an underground source of drinking water are considered Class V injection wells under the EPA UIC program. Class V wells that inject domestic waste only must be permitted by the New Mexico Environment Department.
17. Well Work Over Operations: OCD approval will be obtained from the Director prior to performing remedial work, pressure test or any other Work over. Approval will be requested on OCD Form C-103 "Sundry Notices and Reports on Wells" (OCD Rule 1103.A.) with appropriate copies sent to the OCD Santa Fe District Office.
18. Housekeeping: All systems designed for spill collection/prevention, and leak detection will be inspected to ensure proper operation and to prevent overtopping or system failure.
19. Spill Reporting: All spills/releases shall be reported pursuant to OCD Rule 116. and WQCC 1203. to the OCD Santa Fe District Office.
20. Waste Disposal: All wastes will be disposed of at an OCD approved facility. Only oilfield exempt wastes shall be disposed of down Class II injection wells. Non-exempt oilfield wastes that are non-hazardous may be disposed of at an OCD approved facility upon proper waste determination per 40 CFR Part 261. Any waste stream that is not listed in the discharge plan will be approved by OCD on a case-by-case basis.
21. Annual Report: An Annual report shall be submitted on January 31 of each year. The annual report shall include information required by these conditions of approval and any other relevant information.
22. Land Application Units: Los Alamos National Laboratory shall submit closure plans or operating plans for the two land application units, one located southwest of the site, the other located north of the site. Please submit these plans November 15, 2000 for OCD approval.

Mr. Steven R. Rae

10/13/00

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23. Transfer of Discharge Plan: The OCD will be notified prior to any transfer of ownership, control, or possession of a facility with an approved discharge plan. A written commitment to comply with the terms and conditions of the previously approved discharge plan must be submitted by the purchaser and approved by the OCD prior to transfer.
24. Closure: The OCD will be notified when operations of the facility are discontinued for a period in excess of six months. Prior to closure of the facility a closure plan will be submitted for approval by the Director. Closure and waste disposal will be in accordance with the statutes, rules and regulations in effect at the time of closure.
25. OCD Inspections: Additional requirements may be placed on the facility based upon results from OCD inspections.
26. Storm Water Plan: The facility will have an approved storm water run-off plan by November 15, 2000.
27. Certification: Los Alamos National Laboratory by the officer whose signature appears below, accepts this permit and agrees to comply with all terms and conditions contained herein. Los Alamos National Laboratory further acknowledges that these conditions and requirements of this permit may be changed administratively by the Division for good cause shown as necessary to protect fresh water, human health and the environment.

Conditions accepted by: **Los Alamos National Laboratory**

Dennis Gurule
Company Representative-print name

Mat Johnson For D.G.
Company Representative-Sign

10/26/00
Date
MANAGER, LOS ALAMOS AREA OFFICE
U.S. DEPT. OF ENERGY
Title

Dennis J. Erickson
Company Representative-print name

[Signature] Date October 25, 2000
Company Representative- Sign

Title Division Director - Environment, Safety, and Health

Dan K. Thomas
Company Representative-print name

[Signature] Date 10/27/00
Company Representative-Sign

Facility Manager, FNU 77
Title

STORM WATER MANAGEMENT PLAN

Prepared for

TECHNICAL AREA 57 FENTON HILL PROJECT SITE

**Los Alamos National Laboratory
Los Alamos, NM**

a requirement of the

APPLICATION FOR RENEWAL – DISCHARGE PLAN (GW-031)

**PREPARED BY
Merrick & Company
600 Sixth St, Suite 103
Los Alamos, NM 87544
(505) 662-0606**

OCTOBER 2000

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STORM WATER MANAGEMENT PLAN
for
TECHNICAL AREA 57
FENTON HILL PROJECT SITE

LOS ALAMOS NATIONAL LABORATORY

PREFACE

This Storm Water Management Plan was developed to comply with a condition for approval for renewal of Discharge Plan GW-031, as set forth by the State of New Mexico Energy, Minerals, and Natural Resources Department, Oil Conservation Division. The plan addresses facility and site characteristics, storm water characteristics, potential pollutants, and current storm water management.

1.0 SITE DESCRIPTION

The Fenton Hill Project Site is located in the Jemez Mountains of North Central New Mexico, approximately 35 miles west of Los Alamos and 10 miles north of Jemez Springs. This site is associated with the Department of Energy's Los Alamos National Laboratory (LANL), and has been given the LANL designation of Technical Area (TA) 57. TA-57 has an approximate size of 16 acres. The following sections provide brief descriptions of the history of the site and current operations.

1.1 Site History

The Fenton Hill Project Site was established in 1972 to support the Los Alamos Hot Dry Rock (HDR) Geothermal Energy Development Project. HDR is a research program to develop the technology necessary to economically extract the energy contained at accessible depths within the earth's crust. The project called for injecting water via a borehole to a depth where it would be naturally heated by the hot rocks at that depth, and then pump the water back to the surface for recovery of the energy contained in the heated water. Experimental operations were conducted from 1972 to approximately 1996.

During the period from 1995 to 2000, the HDR project experienced substantial funding reductions, which resulted in the termination of project activities and partial decommissioning of the facility. In 1995, a new astrophysical observatory was constructed in and around the existing 5.7 million gallon reservoir at the Site. Discharges from the venting of the remaining geothermal well is now directed to the existing one million gallon service pond. In 1998, an enhanced evaporation system for this service pond was installed and the discontinuation of the NPDES permitted outfall NM0028576 was approved by the U.S. Environmental Protection Agency.

1.2 Current Status

In 1996, all HDR Project geothermal wells, with the exception of well EE-2A, were plugged and abandoned. With this action the HDR Project no longer has the capability to perform geothermal research and experimentation. Current Site activities are primarily limited to site maintenance, further decommissioning and salvage of equipment and materials, and work associated with the astrophysical observatory. Future HDR activities will be limited to the testing of down-hole logging tools in well EE-2A and experimental drilling using micro-borehole equipment. Micro-borehole depths will be limited to 350 feet to ensure that the aquifer is not penetrated and all drilling fluids will be contained on-site in the one million gallon service pond.

There is no use of geothermal water at the Site by either the HDR Project or the astrophysical observatory. Vented geothermal water from well EE-2A is impounded until evaporation in the one million gallon service pond (see Photo 1, Appendix B). Water used at the site is provided by the facility's domestic water supply well. No commingling of geothermal and potable water occurs and no chemical additives are used.

2.0 STORM WATER CHARACTERISTICS

The following sections address environmental and physical elements that effect the accumulation and transport of storm water at the Fenton Hill Project Site. These include general climatology, runoff patterns, receiving waters, and non-storm water discharges.

2.1 General Climatology

The Site is located in a semiarid, temperate, mountain climate. Summers are generally sunny with moderate, warm days and cool nights. Winter conditions can be experienced from October through March and large snowfall accumulations are not uncommon. Summer temperatures range from 50°F at night to 90°F during the day. Winter temperatures range from 0°F at night to above 32°F during the day. The average annual precipitation is approximately 17 inches. Of this amount, approximately 40% (6.8 inches) is received through brief, intense thunderstorms occurring during the summer monsoon season (July – September).

2.2 Runoff Patterns

The Fenton Hill Project Site slopes gently to the south. This topography produces sheet flow runoff across the majority of the Site with minor concentrated flow at three Site discharge locations. (See Site Map, Appendix A for discharge locations.)

Runoff patterns within the Site can be primarily be categorized with relation to the one million gallon service pond. The area to the north and east of the pond drains to the south where it discharges to a wide, well vegetated, natural conveyance located on the south side of the main Site roadway (see Photo 2, Appendix B). This natural conveyance is lower in elevation than the roadway and runoff is conveyed to the area through a 12 inch corrugated metal pipe. Runoff on the north side of the pond flows either east to the natural conveyance or west and south along the west side of the pond to a low area located on the south side of the pond. A corrugated metal pipe is located in this low area to transfer significant accumulations of runoff off-site to the west (see Photo 3, Appendix B). The areas south and directly east of the service pond drain south to a well vegetated, natural conveyance known as Burns Swale (see Photo 4, Appendix B). Runoff from these areas sheetflow to the top of a gentle slope just south of the fuel storage shed, TA-57-56, and then is concentrated as it is conveyed down the slope in an earthen channel. At the toe of the slope the channel discharges the flow onto a flat, well vegetated area where the runoff resumes sheetflow characteristics as it moves through Burns Swale.

Receiving waters for the Site are tributaries of the Jemez River, which is the major surface water drainage for the area. Surface runoff from the Site discharges into Lake Fork Creek located to the south. Lake Fork Creek is a tributary of the Rio Cebolla, which in turn is a tributary of the Rio Guadalupe. The Rio Guadalupe flows into the Jemez River below the town of Jemez Springs.

2.3 Non-Storm Water Discharges

With the termination of geothermal activities and partial decommissioning of the facility, there are very few non-storm water discharges at the site. Those that do occur are of such minor magnitude that they do not significantly impact runoff accumulations or patterns. Non-storm water is typically discharged through a standard "garden" hose. Potential non-storm water discharges may include vehicle/equipment washing, dust suppression or soil moistening associated with maintenance activities, and watering of vegetation.

3.0 POTENTIAL POLLUTANTS

Potential Pollutants that have been identified at the Fenton Hill Project Site include equipment, materials, and exposed soil. These items are discussed in the following section. Controls associated with these potential pollutants are addressed in Section 4. Potential Release Sites (PRSs), which resulted from previous site activity and were identified by the LANL Environmental Restoration (ER) Project, are also discussed for informational purposes.

3.1 Equipment, Materials & Soil

Equipment that includes a forklift, a bulldozer, transport vehicles, piping systems, pumps, and generators are stored in multiple locations throughout the Site. The vehicles and heavy equipment are used primarily for site maintenance activities while the majority of the remaining items are awaiting salvage. Potential pollutants associated with the equipment include fuel and fluid leaks from operational equipment, and potential leaching of materials from salvage items subjected to long-term exposure.

Materials at the Site include metal and plastic storage tanks; assorted piping; 55-gallon drums of salt; metal cuttings and slag from cutting, grinding, and welding; fuel and fluids from equipment and vehicles; fuel stored in two metal tanks; and residual waste oil stored in one fiberglass tank. Storage tanks and piping materials are awaiting salvage while the remaining items are used in associated with maintenance operations.

The majority of the interior area of the Site, which includes the roadways, is exposed soil. However, this area is relatively flat, and with sheetflow runoff patterns, there is no evidence of erosion or significant sediment transport. The perimeter of the Site is well vegetated. There are no identified erosional problems within the Fenton Hill Project Site or locations with significant offsite sediment transport.

3.2 Potential Release Sites

Geothermal experiments at the Fenton Hill Project Site facilitated the creation of circulation ponds, an outfall, a sludge disposal pit, and discharge areas for an on-site analytical trailer and other materials associated with the experiments. Ten such locations were identified and labeled PRSs by the LANL ER Project in 1994.

The drilling fluids, produced waters, and other wastes associated with exploration, development, or production of geothermal energy are not hazardous wastes as defined in the Resource Conservation and Recovery Act (RCRA), and are exempt from RCRA hazardous waste consideration. For this reason the PRSs at the Fenton Hill Project Site are not listed in LANL's Hazardous and Solid Waste Amendments (HSWA) permit. However, LANL agreed to follow the requirements of HSWA (Module VII of the RCRA permit) to ensure that all environmental problems are investigated in a consistent manner.

3.2.1 PRS DESCRIPTIONS

Of the ten identified PRSs, two were recommended for no further action (NFA) and two for deferred action. The remaining six were evaluated in a Phase I investigation conducted in 1996. Following is a brief description of these six PRSs.

- 57-001(b): This PRS comprises two settling ponds designated GTP-3E (east) and GTP-3W (west) that were used during the drilling and operation of well GT-2. Pond GTP-3W was created by building a 10 foot high berm across the head of Burns Swale and excavating into the tuff. The ponds contained a homogeneous mix of cuttings, drilling mud, additives, and dissolved materials that were returned to the surface in the heated waters. Following

decommissioning of the site, the pond was backfilled with boulders and clean soil and leveled with the surrounding terrain.

- 57-001(c): This PRS is a settling pond used during geothermal energy recovery experiments. It contained a homogeneous mix of cuttings, drilling mud, additives, and dissolved materials that were returned to the surface in the heated waters. The pond was decommissioned, cleaned, and filled with clean soil to the level of the surrounding terrain.
- 57-002: This PRS was a sludge pit used between 1974 and 1990. The pit received solids removed from the bottom of the settling ponds and mud removed from the drilling mud pits. Solids included cuttings, drilling muds, and the precipitate from recovered circulation water.
- 57-004(a): This PRS is settling pond GTP-1E. The pond was originally excavated for use as the disposal pit for the drilling of well EE-1 and was later enlarged to serve as a settling pond for discharged drilling materials and for recycling of fluids from the circulation loop. The pond was decommissioned, cleaned of sludge, and backfilled with clean soil to the level of the surrounding terrain.
- 57-006: This PRS was a 55-gallon drum buried beneath a trailer that was used as an analytical chemistry laboratory. The drum contained chemicals that were considered too dangerous to be disposed of via the sink drain. A special drain in the trailer connected to the drum. The drum and its residual contents were removed as a voluntary corrective action on September 15, 1994.
- 57-007: This PRS was a chemical waste leach field associated with the analytical chemistry laboratory. Wastewater from the trailer was poured into a sink that drained to the subsurface leach field.

3.2.2 ER RECOMMENDATIONS

Following are the remediation recommendations provided by the LANL ER Project at the conclusion of the Phase I investigation.

- 57-001(b) – Pond GTP-3W: Elevated concentrations of arsenic and barium were detected in pond GTP-3W at a level 11-12 feet below the ground surface. At this depth the potential for human contact with the contaminants is negligible. For this reason, this portion of the PRS was recommended for NFA.
- 57-001(b) – Burns Swale: Samples in this portion of the PRS revealed arsenic and manganese concentrations that exceeded upper tolerance levels (UTL). For this reason Burns Swale is scheduled for Phase II (accelerated, focused) field investigation to determine the extent of the contamination.
- 57-001(c): Multiple analytes were detected but their concentrations were below their respective background UTLs. On this basis this PRS was recommended for NFA.
- 57-002: Arsenic was detected at concentrations greater than its UTL and barium in concentrations exceeding its screening action level (SAL). For this reason, voluntary corrective action is recommended.
- 57-004(a): Analysis of samples from this pond showed that there were no chemicals found in concentrations exceeding the SALs. On this basis, NFA was recommended.
- 57-006: Sampling of the soil beneath the drum showed that there were no chemicals found in concentrations exceeding the SALs. On this basis, NFA was recommended.
- 57-007: Analytical results and the screening assessment indicated negligible risk. For this reason the PRS was recommended for NFA.

4.0 STORM WATER MANAGEMENT

In general, no attempt is made to eliminate or minimize the natural flow of storm water from the Site. Instead, emphasis is placed on preventing contamination of the runoff by retaining sediment on-site; minimizing contact with potential pollutants, and by diverting it from the locations in which erosion or pollutant contamination may take place. This control is achieved through the use of both applicable structural controls and administrative work procedures.

4.1 Structural Controls

Structural controls associated with storm water management include culverts, a drainage channel, rock check dams, covering, and secondary containment units. Three culverts are in place at the Site to facilitate the management of runoff. Corrugated metal pipes on the west and southeast sides of the Site have been installed at locations where storm water runoff accumulates and leaves the Site. A third culvert located under a concrete walkway adjacent to the CMP on the southeast side of the Site conveys runoff to the discharge location. By conveying concentrated flows through culverts, erosion and sediment transport is minimized.

At the head of Burns Swale is a small gentle south-facing slope. Sheetflow runoff that reaches the top of the slope is collected and conveyed down the west side of the slope in a constructed earthen drainage channel. At the toe of the slope the channel directs the flow east to the middle of the area where the terrain is flat and well vegetated. Use of the channel minimizes the potential for erosion down the face of the slope and conveys runoff to a location where it is most likely to resume sheetflow characteristics. Within the drainage channel are three rock check dams (see Photo 5, Appendix B). The check dams dissipate energy and velocity in the flow, allowing transported sediment to settle out within the channel.

Two fuel storage areas are located within the Site. One area, located on the north side of the facility, contains a fiberglass waste oil tank that is currently empty. The second area, located south of building 57-17, houses two small metal tanks containing gasoline and diesel fuel (see Photo 6, Appendix B). Both areas are covered and all the tanks reside in concrete secondary containment.

4.2 Administrative Controls

Administrative controls associated with storm water management include appropriate work procedures, Site inspections, and spill response and reporting. Appropriate work procedures minimize the risk of contact between storm water and potential pollutants. To achieve this, equipment and materials are properly stored and maintained, and fueling operations and the loading/unloading of identified potential pollutants are not conducted during precipitation events.

Site inspections are conducted monthly. Items that are evaluated include general site conditions, equipment and material storage areas, fuel storage area secondary containment units, storm water structural controls, new areas of erosion or significant sediment transport, and the general condition of the one million gallon service pond with its associated secondary containment unit and sump pump. If deficient items are identified, appropriate maintenance activities are initiated.

Spill control equipment is available on site to address minor spills and leaks. In addition, spills or releases of oil or hazardous substances will be reported to the Emergency Management & Response (EM&R) Office at 667-6211 or, after hours, at 667-7080. In accordance with LANL requirements, internal spill reporting will be completed in the event of any release and copies of the reports will be maintained by both the responsible organization and ESH-18. ESH-18 and the EM&R Office, in accordance with Laboratory and DOE policies, and federal and state regulatory reporting requirements, will make the determination for federal notification.

APPENDIX A:

Site Map



Fenton Hill

Legend

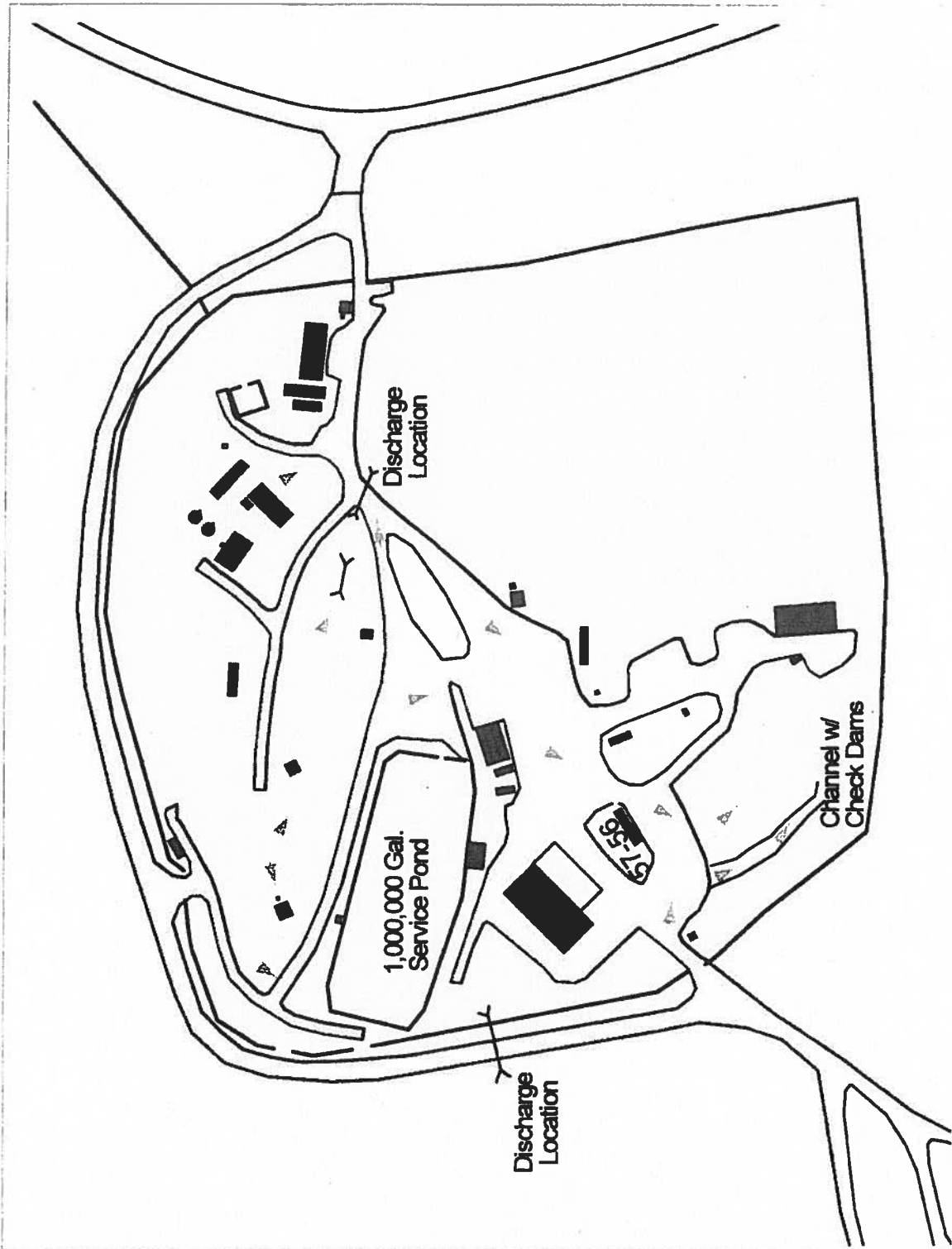
- Drainage Flow
- Storm drain

30 0 30 60 Feet



600 Sixth Street, Suite 103
Los Alamitos, NM 87544
(505) 662-0606

Oct 31, 2000



APPENDIX B:

Site Photographs

Photo 4 – Burns Swale



Photo 5 – Drainage Channel & Rock Check Dam



Photo 6 – Fuel Storage Area (TA-57-56)



Photo 1 – One Million Gallon Service Pond

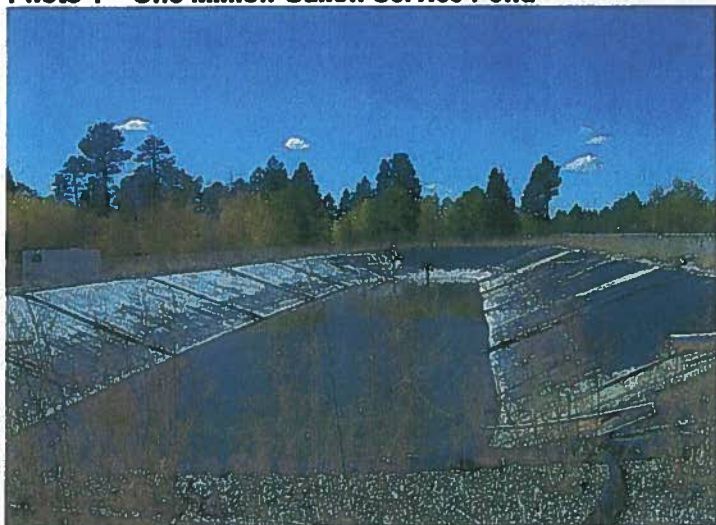


Photo 2 – Southeast Discharge Location



Photo 3 – West Side Discharge Location

