GW-31

GENERAL CORRESPONDENCE

YEAR(S):

2005 - 2000

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
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Date: February 7, 2003
Refer to: RRES-WQH: 03-031

Mr. Wayne Price
Petroleum Engineering Specialist
Oil Conservation Division
New Mexico Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

SUBJECT: PROGRESS REPORT AND PROPOSED BACKFILL PLAN, 1-MG SERVICE POND, FENTON HILL GEOTHERMAL FACILITY

Dear Mr. Price:

As you are aware, since October 2002, Los Alamos National Laboratory has been in the process of closing the Fenton Hill Hot Dry Rock Geothermal Facility's 1-million gallon (MG) service pond. After making significant progress, the Laboratory is entering the final stages of closure. I would like to provide you with a progress report on the work completed to-date. In addition, this letter presents the Laboratory's proposed plan for backfilling the pond for your review and approval. Progress report information is contained within Section I while the proposed backfill plan is presented in Section II.

Section I-Progress Report

In accordance with the requirements of the Laboratory's Closure Plan for the Fenton Hill 1-MG Service Pond (LA-UR-02-5009, August 2002), closure activities to-date have generated the following documents:

1. Analytical results from sampling the 1-MG pond sludge;
2. Disposal records for the 1-MG pond geothermal fluids and sludge;
3. Disposal records for the liners, geofiber matting, and gravel;
4. Photographs of the site during closure activities;
5. NORM survey results of the leak collection piping;
6. Forest Service letter requesting sampling of the soil beneath the liners;
7. Sampling and Analysis Plan for characterizing the soil beneath the liners;
8. Total metals and SVOA analytical results from sampling the soil beneath the liners;
9. TCLP analytical results from sampling the soil beneath the liners;
10. Geodetic survey of the 1-MG pond and associated structures;
11. LANL response to the Forest Service's request for additional information; and
12. Forest Service letter approving the Laboratory's proposed backfill plan.

A brief discussion of each of the above documents is presented below.

1. Sludge Sampling Analytical Results

In accordance with Section 2.1.2 of the Closure Plan, a representative sample of sludge from the 1-MG service pond was collected on October 21, 2002, and submitted to General Engineering Laboratories, Charleston, SC, for the following analyses: volatile organics analysis (VOA), semi-volatile organics analysis (SVOA), total metals, and TCLP metals. Attachment 1 contains copies of the analytical reports.

2. Geothermal Fluids and Sludge Disposal Records

Key Energy Services, Inc., Farmington, NM, (OCD Permit No. NM-01-0011) transported 201,600 gallons or 4,800 barrels (60 truckloads @ 80 bbls/load) of geothermal fluids to a commercial evaporation pit at TNT Environmental, Inc., Lindrith, NM (OCD Permit No. NM-01-0008). Attachment 2 contains copies of the disposal tickets for the geothermal fluids.

In addition, Key Energy transported 43,680 gallons or 1,040 barrels of liquefied sludge to TNT's commercial land farm in Lindrith, NM. Attachment 2 contains copies of the disposal tickets for the sludge.

3. Liner Disposal Records

L&R Oilfield Services, a subcontractor to Key Energy Services, removed the primary and secondary liners and associated geofiber matting from the 1-MG service pond (see pictures of liner removal in Attachment 4). The liner was steam-cleaned prior to removal. The primary and secondary liners were recycled by L&R while the geofiber matting was disposed of at Waste Management's Rio Rancho landfill. Attachment 3 contains a copy of the disposal ticket for the geofiber matting.

Approximately 25 cubic yards of gravel from the 1-MG service pond's leak collection system was removed by L&R and disposed of at Envirotech, Inc., Farmington, NM. Attachment 3 contains a copy of the disposal ticket for the leak collection system gravel.

4. Photographs of Closure Activities

Attachment 4 contains photographs of closure activities conducted at the 1-MG service pond.

5. NORM Survey Results

In accordance with Section 7.3 of the Closure Plan, the leak collection system piping (4" perforated PVC pipe) was surveyed by Laboratory radiological technicians for Naturally Occurring Radioactive Material (NORM). Attachment 5 contains the survey results from the 100 readings taken from the 200 feet of pipe. The maximum reading of 1.54 micro R per hour is well below the 50 micro R per hour limit established by regulation (20.3.1.14 NMAC).

6. Forest Service Request for Confirmation Sampling

In a September 27, 2002, letter (Attachment 6) to Los Alamos National Laboratory, Mr. Leonard Atencio, Forest Supervisor, Santa Fe National Forest, requested that a minimum of two confirmation samples be collected from the soils beneath the 1-MG service pond's secondary liner. In addition, Mr. Atencio requested that if there is any visual evidence of leakage then the suspected material should also be sampled.

In response to the elevated concentrations of total arsenic in the crusher fines, the Laboratory initiated the following:

1. Three surface samples (RC57-03-49714, RC57-03-49718, and RC57-03-49720) were submitted to General Engineering Laboratories, Charleston, SC, for TCLP metals analysis. Attachment 9 contains a copy of General Engineering Laboratories' analytical report;

2. Two new surface samples of the crusher fines (FH#1 and FH#2) were collected from the 1-MG service pond at locations above the pond's overflow and submitted to the EES analytical laboratory for total arsenic analysis; and

3. A tuff sample from outside of the 1-MG service pond was collected and submitted to the EES analytical laboratory for total arsenic analysis.

Analytical results from the above sampling are presented in Table 1.0 below.

Table 1.0. Underliner Soil Sampling Results for Fenton Hill 1-MG Service Pond

Sample ID#	Sample Date	Location (Depth)	Sample Type	Total Arsenic[1] (ppm)	TCLP Arsenic[2,3] (mg/L)
Samples Collected From The Bottom of the Pond					
RC57-03-49714	11/18/02	surface 0"-6"	crusher fines	272	0.120
RC57-03-49715	11/18/02	depth 18"-24"	tuff	23.7	
RC57-03-49716	11/18/02	surface 0"-6"	crusher fines	197	
RC57-03-49717	11/18/02	depth 10"-16"	tuff	52.5	
RC57-03-49718	11/18/02	surface 0"-6"	crusher fines	232	0.104
RC57-03-49719	11/18/02	depth 18"-24"	tuff	8.84	
RC57-03-49720	11/18/02	surface 0"-6"	crusher fines	254	0.130
RC57-03-49721	11/18/02	depth 18"-24"	tuff	26.6	
RC57-03-49722	11/18/02	surface 0"-6"	crusher fines	204	
RC57-03-49723	11/18/02	depth 18"-24"	tuff	8.85	
Samples Collected From Above the Pond's Overflow Pipe					
FH#1	11/24/02	surface 0"-6"	crusher fines	232	
FH#2	11/24/02	surface 0"-6"	crusher fines	332	
Samples Collected Outside of the Pond					
FH#3	11/24/02	surface 0"-6"	tuff	2.57	

[1]Analysis by the Laboratory's EES analytical laboratory.
[2]Analysis by General Engineering Laboratories, Charleston, SC.
[3]Per 40CRF 261.24, the TCLP concentration limit for arsenic is 5.0 mg/L.

The elevated concentrations of total arsenic (232 ppm and 332 ppm) in the two surface samples collected above the 1-MG service pond's overflow suggest that the arsenic in the crusher fines is naturally occurring and not due to contamination from leaking geothermal fluids. Further, the TCLP concentration of arsenic in the crusher fines (0.120 mg/L, 0.104 mg/L, 0.130 mg/L) is well below the regulatory level (5.0 mg/L) to be a characteristic hazardous waste (40CFR 261.24).

Visual inspection of the soils beneath the liners by Laboratory personnel did not show any evidence of leakage. The crusher fines lining the pond did not display any staining, discoloration, or areas of saturation (see photographs in Attachment 4). The low moisture content of the core samples collected from the bottom of the pond support the visual record; the moisture content of the ten samples collected ranged from 5.6% to 12.48% with an average moisture content of 6.9% (see Attachment 8).

7. Sampling and Analysis Plan for Underliner Soils

In response to the Forest Service's request, a Sampling and Analysis Plan (SAP) was prepared by the Laboratory to characterize the soils beneath the 1-MG service pond liners prior to backfilling. Attachment 7 contains a copy of the SAP. This SAP should be considered an addendum to the August 2002 Closure Plan.

The objectives of the SAP were to collect a sufficient number of samples to (1) perform a human health screening assessment, and (2) define the nature and extent of any potential contamination encountered. Based upon prior sampling activities conducted at the site, the minimum number of samples required to meet these objectives was determined to be five sets of inorganic and one set of organic samples. Each set consist of two samples collected from two depths.

8. and 9. Underliner Soil Sampling Analytical Results

In accordance with the Sampling and Analysis Plan referenced above, on November 18, 2002, the Laboratory collected ten inorganic samples from five locations in the bottom of the 1-MG service pond using a Simco coring rig. Attachment 4 contains photographs of the sampling activities. The core barrel was drilled to a depth of approximately two feet at each location; a surface sample (0"-6") and a depth sample (18"-24") were prepared at each of the locations. Samples were submitted to the Laboratory's Earth and Environmental Sciences (EES) analytical laboratory for total metals analysis. The surface samples (0"-6") consisted of crusher fines that were imported from a crusher pit near Jemez Pueblo, NM, during the construction of the pond to "bed" the liner. The depth samples (18"-24") consisted of native tuff. In one location (RC57-03-49717), due to the hardness of the tuff the core was unable to penetrate to the target depth of 24". As a result, the depth sample at this location was collected from the 10"-16" interval.

Analytical results from the November 18th sampling are presented in Attachment 8. All results were below the Environmental Protection Agency's Preliminary Remediation Goals (PRGs) for soil with the exception of arsenic (As). Table 1.0 below presents a summary of the arsenic results.

Total arsenic concentrations in the crusher fines (surface samples) ranged from 204 ppm to 272 ppm with an average concentration of 232 ppm. In contrast, total arsenic concentrations in the tuff (depth samples) ranged from 8.8 ppm to 52.5 ppm with an average concentration of 24 ppm. On average, the data shows a ten-fold reduction (232 ppm to 24 ppm) in the concentration of total arsenic from the surface (0"-6") to depth (10"-24").

In addition to the ten inorganic samples collected, two organic samples were submitted to General Engineering Laboratories, Charleston, SC, for semi-volatile organics analysis (SVOA). Sample results are presented in Attachment 8. No target compounds were detected in either of the samples at concentrations greater than the analytical laboratory's reporting limit.

In response to the elevated concentrations of total arsenic in the crusher fines, the Laboratory initiated the following:

1. Three surface samples (RC57-03-49714, RC57-03-49718, and RC57-03-49720) were submitted to General Engineering Laboratories, Charleston, SC, for TCLP metals analysis. Attachment 9 contains a copy of General Engineering Laboratories' analytical report;

2. Two new surface samples of the crusher fines (FH#1 and FH#2) were collected from the 1-MG service pond at locations above the pond's overflow and submitted to the EES analytical laboratory for total arsenic analysis; and

3. A tuff sample from outside of the 1-MG service pond was collected and submitted to the EES analytical laboratory for total arsenic analysis.

Analytical results from the above sampling are presented in Table 1.0 below.

Table 1.0. Underliner Soil Sampling Results for Fenton Hill 1-MG Service Pond

Sample ID#	Sample Date	Location (Depth)	Sample Type	Total Arsenic[1] (ppm)	TCLP Arsenic[2,3] (mg/L)
Samples Collected From The Bottom of the Pond					
RC57-03-49714	11/18/02	surface 0"-6"	crusher fines	272	0.120
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RC57-03-49717	11/18/02	depth 10"-16"	tuff	52.5	
RC57-03-49718	11/18/02	surface 0"-6"	crusher fines	232	0.104
RC57-03-49719	11/18/02	depth 18"-24"	tuff	8.84	
RC57-03-49720	11/18/02	surface 0"-6"	crusher fines	254	0.130
RC57-03-49721	11/18/02	depth 18"-24"	tuff	26.6	
RC57-03-49722	11/18/02	surface 0"-6"	crusher fines	204	
RC57-03-49723	11/18/02	depth 18"-24"	tuff	8.85	
Samples Collected From Above the Pond's Overflow Pipe					
FH#1	11/24/02	surface 0"-6"	crusher fines	232	
FH#2	11/24/02	surface 0"-6"	crusher fines	332	
Samples Collected Outside of the Pond					
FH#3	11/24/02	surface 0"-6"	tuff	2.57	

[1]Analysis by the Laboratory's EES analytical laboratory.
[2]Analysis by General Engineering Laboratories, Charleston, SC.
[3]Per 40CRF 261.24, the TCLP concentration limit for arsenic is 5.0 mg/L.

The elevated concentrations of total arsenic (232 ppm and 332 ppm) in the two surface samples collected above the 1-MG service pond's overflow suggest that the arsenic in the crusher fines is naturally occurring and not due to contamination from leaking geothermal fluids. Further, the TCLP concentration of arsenic in the crusher fines (0.120 mg/L, 0.104 mg/L, 0.130 mg/L) is well below the regulatory level (5.0 mg/L) to be a characteristic hazardous waste (40CFR 261.24).

In summary, the data strongly suggest that the crusher fines imported to construct the 1-MG service pond contain elevated concentrations of naturally occurring arsenic. Further, the data suggest that the arsenic in the crusher fines is tightly bound and not highly mobile under the extraction conditions of the TCLP method (EPA Method 1311). And finally, the data confirms that the arsenic in the crusher fines is below the regulatory level to be a characteristic hazardous waste.

10. Geodetic Survey of the 1-MG Service Pond

In accordance with Section 6.2 of the Closure Plan, the Laboratory conducted a geodetic survey of the 1-MG service pond and associated structures. Attachment 10 contains a copy of the survey results.

11. LANL Response to the Forest Service's Request for Additional Information

On January 16, 2003, the Laboratory submitted a Progress Report and Proposed Backfill Plan (essentially a mirror of this report) to Mr. John Peterson, Jemez District Ranger. On January 27, 2003, the Forest Service verbally requested additional information on the Laboratory's Progress Report and Proposed Backfill Plan. Attachment 11 contains a copy of the Laboratory's February 3, 2003, response to the Forest Service's request.

12. Forest Service Letter Approving the Laboratory's Proposed Backfill Plan

Attachment 12 contains a fax copy of a February 3, 2003, letter from Mr. John Peterson, Jemez District Ranger, approving the Laboratory's proposed plan to bury the crusher fines in the bottom of the 1-MG service pond.

Section II-Proposed Backfill Plan

The information collected under the Closure Plan and presented above indicate the following:

- The data suggest that the crusher fines in the 1-MG service pond contain elevated concentrations of naturally occurring arsenic.
- The data confirms that the arsenic in the crusher fines is below the regulatory level to be a characteristic hazardous waste.
- The data suggest that the arsenic in the crusher fines does not pose a significant threat to ground water. This is supported by the low mobility of the arsenic, as demonstrated by the TCLP results, and the depth to ground water at the site. Depth to ground water beneath the 1-MG service pond is approximately 380 feet.

Based upon the above, the Laboratory proposes to consolidate the crusher fines into the bottom of the 1-MG service pond and backfill over them. Backfill material will come from the earthen berm that forms the southern boundary of the 1-MG service pond. This berm will provide approximately 1000 yd^3 of backfill material. Additional material will be imported, if necessary. A minimum of 6 feet of cover will be maintained over the buried crusher fines. As specified in Section 8.0 of the Closure Plan, all disturbed areas will be re-seeded according to Laboratory and Forest Service requirements.

Please contact me at (505) 667-7969 should you have any questions regarding this progress report and proposed plan for completing closure of the 1-MG service pond.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

BB/yg

Attachments: a/s

Cy: M. Kieling, NM OCD, Santa Fe, New Mexico, w/att.
J. Peterson, Forest Service, Jemez Ranger District, Jemez Springs, New Mexico, w/o att.
A. Ferrell, Forest Service, Jemez Ranger District, Jemez Springs, New Mexico, w/o att.
C. Linn, Forest Service, Santa Fe National Forest, Santa Fe, New Mexico, w/o att.
J. Vozella, DOE/OLASO, w/o att., MS A316
G. Turner, DOE/OLASO, w/att., MS A316
J. Holt, ADO, w/o att., MS A104
C. Webster, ADSR, w/o att., MS A127
P. Weber, EES-DO, w/o att., MS D446
J. Hansen, EES-DO, w/ att., MS D446
J. Thomson, EES-11, w/ att., MS D443
S. Archuleta, P-FM, w/o att., MS D410
B. Ramsey, RRES-DO w/o att., MS J591
K. Hargis, RRES-DO, w/o att., MS J591
D. Stavert, RRES-EP, w/o att., MS J591
S. Rae, RRES-WQH, w/att., MS K497
D. Rogers, RRES-WQH, w/o att., MS K497
D. McInroy, RRES-R, w/o att., MS M992
T. Rust, RRES-R, w/att., MS M992
T. Grieggs, RRES-SWRC, w/o att., MS K490
B. Kopp, RRES-SWRC, w/o att., MS M992
H. Wheeler-Benson, RRES-SWRC, w/att., MS K490
E. Louderbough, LC-ESH, w/att., MS A187
RRES-WQH File, w/att., MS K497
IM-5, w/att., MS A150

ATTACHMENT 1

Analytical Results

1-MG Service Pond Sludge

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0210FHSLDG

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 69376

Matrix: (soil/water) WATER Lab Sample ID: 69376001

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: 2H421

Level: (low/med) LOW Date Received: 10/24/02

% Moisture: not dec. _____ Date Analyzed: 10/31/02

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/L	Q
75-01-4	Vinyl chloride	0.010	U
75-35-4	1,1-Dichloroethylene	0.010	U
78-93-3	2-Butanone	0.050	U
67-66-3	Chloroform	0.010	U
56-23-5	Carbon tetrachloride	0.010	U
107-06-2	1,2-Dichloroethane	0.010	U
71-43-2	Benzene	0.010	U
79-01-6	Trichloroethylene	0.010	U
127-18-4	Tetrachloroethylene	0.010	U
108-90-7	Chlorobenzene	0.010	U
106-46-7	1,4-Dichlorobenzene	0.010	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0210FHSLDG

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 69376

Matrix: (soil/water) WATER Lab Sample ID: 69376001

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: S5K0610

Level: (low/med) LOW Date Received: 10/24/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:11/01/02

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 11/06/02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/L	Q
110-86-1	Pyridine	0.050	U
106-46-7	1,4-Dichlorobenzene	0.050	U
95-48-7	o-Cresol	0.0038	J
106-44-5	m,p-Cresols	0.0059	J
67-72-1	Hexachloroethane	0.050	U
98-95-3	Nitrobenzene	0.050	U
87-68-3	Hexachlorobutadiene	0.050	U
88-06-2	2,4,6-Trichlorophenol	0.050	U
95-95-4	2,4,5-Trichlorophenol	0.050	U
121-14-2	2,4-Dinitrotoluene	0.050	U
118-74-1	Hexachlorobenzene	0.050	U
87-86-5	Pentachlorophenol	0.050	U

TOTAL METALS
- 1 -
INORGANIC ANALYSIS DATA PACKAGE

SDG No.: 69376 **Method Type:** SW846

Sample ID: 69376001 **Client ID:** 0210FHsldg

Contract: ESHL00501 **Lab Code:** GEL **Case No.:** GEL **SAS No.:**

Matrix: TCLP **Date Received:** 10/24/2002 **Level:** LOW **% Solids:** 0.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7440-38-2	Arsenic	6.270	mg/L			P	0.024	TJA61 Trace ICP2	110102
7440-39-3	Barium	0.685	mg/L			P	0.004	TJA61 Trace ICP2	110102
7440-43-9	Cadmium	0.004	mg/L	U		P	0.004	TJA61 Trace ICP2	110102
7440-47-3	Chromium	0.019	mg/L	B		P	0.007	TJA61 Trace ICP2	110102
7439-92-1	Lead	0.027	mg/L	U		P	0.027	TJA61 Trace ICP2	110102
7782-49-2	Selenium	0.034	mg/L	U		P	0.034	TJA61 Trace ICP2	110102
7440-22-4	Silver	0.012	mg/L	U		P	0.012	TJA61 Trace ICP2	110102

Color Before: **Clarity Before:** **Texture:**

Color After: **Clarity After:** **Artifacts:**

Comments:

TOTAL METALS
- 1 -
INORGANIC ANALYSIS DATA PACKAGE

SDG No.: 69376-1 **Method Type:** SW846

Sample ID: 69377001 **Client ID:** 0210FHsldg

Contract: ESHL00501 **Lab Code:** GEL **Case No.:** GEL **SAS No.:**

Matrix: SOIL **Date Received:** 10/24/2002 **Level:** LOW **% Solids:** 11.70

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7429-90-5	Aluminum	11110000	µg/kg		E	P	6280	TJA61 Trace ICP2	102802
7440-36-0	Antimony	15900	µg/kg		*	MS	421	PE ICPMS3	021026
7440-38-2	Arsenic	2940000	µg/kg		E	P	1630	TJA61 Trace ICP2	102802
7440-39-3	Barium	634000	µg/kg		E	P	528	TJA61 Trace ICP2	102802
7440-41-7	Beryllium	1290	µg/kg	B		P	396	TJA61 Trace ICP2	102802
7440-42-8	Boron	2670000	µg/kg		E	P	3790	TJA61 Trace ICP2	102802
7440-43-9	Cadmium	1140	µg/kg	B		P	378	TJA61 Trace ICP2	102802
7440-47-3	Chromium	208000	µg/kg		E	P	1270	TJA61 Trace ICP2	102802
7440-48-4	Cobalt	2690	µg/kg	B		P	632	TJA61 Trace ICP2	102802
7440-50-8	Copper	81100	µg/kg			P	1610	TJA61 Trace ICP2	102802
7439-89-6	Iron	43970000	µg/kg		E	P	12400	TJA61 Trace ICP2	102802
7439-92-1	Lead	69000	µg/kg			P	2250	TJA61 Trace ICP2	102802
7439-96-5	Manganese	612000	µg/kg		EN	P	1040	TJA61 Trace ICP2	102802
7439-97-6	Mercury	8210	ug/kg			AV	82.9	PE CVAA	103002S2Hg
7439-98-7	Molybdenum	320000	µg/kg		EN	P	1000	TJA61 Trace ICP2	102802
7440-02-0	Nickel	25500	µg/kg			P	676	TJA61 Trace ICP2	102802
7782-49-2	Selenium	3900	µg/kg	B		P	1280	TJA61 Trace ICP2	102802
7440-22-4	Silver	1500	µg/kg	B		P	714	TJA61 Trace ICP2	102802
7440-28-0	Thallium	2090	µg/kg			MS	168	PE ICPMS3	021026
7440-61-1	Uranium	18700	µg/kg	U		P	18700	TJA61 Trace ICP2	102802
7440-62-2	Vanadium	59700	µg/kg		N	MS	6280	PE ICPMS3	021026
7440-66-6	Zinc	658000	µg/kg			MS	1030	PE ICPMS3	021026

Color Before: **Clarity Before:** **Texture:**

Color After: **Clarity After:** **Artifacts:**

Comments:

TOTAL METALS
- 1 -
INORGANIC ANALYSIS DATA PACKAGE

SDG No.: 69376-2 **Method Type:** SW-846

Sample ID: 70833001 **Client ID:** 0210FHsldg

Contract: ESHL00501 **Lab Code:** GEL **Case No.:** GEL **SAS No.:**

Matrix: TCLP **Date Received:** 10/24/2002 **Level:** LOW **% Solids:** 0.00

CAS No.	Analyte	Concentration	Units	C	Qual	M	DL	Instrument ID	Analytical Run
7439-97-6	Mercury	0.0005	mg/L	U		AV	0.0005	PE CVAA2	120302W1Hg

Color Before: **Clarity Before:** **Texture:**

Color After: **Clarity After:** **Artifacts:**

Comments:

AM E 12/5/03

Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497 ESH-18
Water Quality & Hydrology
Los Alamos, New Mexico 87545
Contact: Billy Turney
Project: Sediments/Soils

Report Date: December 5, 2002

Client Sample ID:	0210FHsldg	Project:	ESHL00501
Sample ID:	70833001	Client ID:	ESHL001
Matrix:	Sludge		
Collect Date:	21-OCT-02 16:00		
Receive Date:	24-OCT-02		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Mercury Analysis Federal										
TCLP Hg in Solid										
Mercury	HU	ND	0.000472	0.002	mg/L	1	NOR1 12/03/02	1928	218985	1

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep TCLP Liquid	KHN	11/21/02	1400	217447
SW846 7470A Prep	EPA 7470A Mercury Prep TCLP Liquid	KHN	12/02/02	1230	218983
SW846 1311	SW846 1311 TCLP Leaching -FEDERAL	COB1	11/19/02	1737	217101
SW846 1311	SW846 1311 TCLP Leaching -FEDERAL	COB1	11/26/02	2010	218190

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 7470A	

Notes:
The Qualifiers in this report are defined as follows :

< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration exceeds instrument calibration range
H Holding time exceeded
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
P The response between the confirmation column and the primary column is >40%D
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package
Y QC Samples were not spiked with this compound.

The above sample is reported on an "as received" basis.

Certificate of Analysis

Company : Los Alamos National Labs
Address : MS K497 ESH-18
Water Quality & Hydrology
Los Alamos, New Mexico 87545
Contact: Billy Turney
Project: Sediments/Soils

Report Date: December 5, 2002

Client Sample ID: 0210FHsldg
Sample ID: 70833001

Project: ESHL00501
Client ID: ESHL001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Stacy Griffin.

Reviewed by

ATTACHMENT 2

Disposal Records

1-MG Service Pond
Geothermal Fluids and Sludge

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1211

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10-23-02 CUSTOMER Los Alamos National Lab.

WELL NAME & NUMBER Geo Thermo Res. pit

TRUCKING CO. Key Energy UNIT NO X50

DRIVER MC ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE

Reprographics 0499267

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1180

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10/23/02 CUSTOMER Los Alamos National Laboratory

WELL NAME & NUMBER Geo Thermo Well site

TRUCKING CO. KEY UNIT NO 840

DRIVER S Gallegos ARRIVAL TIME

ORDERED BY Jeffrey DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				

☐ 60 BARREL ☐ 100 BARREL 80.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc. 1179

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10/23/02 CUSTOMER Los Alamos National Laboratory

WELL NAME & NUMBER GEO Thermo Well Site

TRUCKING CO. Key UNIT NO 841

DRIVER Scott ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				Scott
80				Scott

☐ 60 BARREL ☐ 100 BARREL 160.00 ~~140.~~

ATTENDANT'S SIGNATURE T.O.

Reprographics 049928T

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc. 1200

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10/2/02 CUSTOMER Los Alamos National Lab

WELL NAME & NUMBER GEO Thermo Pit

TRUCKING CO. Key UNIT NO 841

DRIVER Scott ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				Scott

☐ 60 BARREL ☐ 100 BARREL 80.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

1199

DATE 10-24-02 CUSTOMER Los Alamos National Laboratory

WELL NAME & NUMBER GEO thermo pit

TRUCKING CO. Key Energy UNIT NO 930

DRIVER MC ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE

Reprographics 049926T

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

1194

DATE 10/24/02 CUSTOMER LOS ALAMO NAT LABS

WELL NAME & NUMBER GEO THERMO PIT

TRUCKING CO. KEY UNIT NO 840

DRIVER J BOLEGOS ARRIVAL TIME

ORDERED BY JEFFRY DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				

☐ 60 BARREL ☐ 100 BARREL 80.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc. 1192

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10-24-02 CUSTOMER Los Alamos Nat. Lab.

WELL NAME & NUMBER Geo Thermo Pit

TRUCKING CO. KEY ENERGY UNIT NO 826

DRIVER R. Saenz ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Rudolfo Saenz

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE Z.A.

Reprographics 0499267

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc. 1193

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10-24-02 CUSTOMER Los Alamos National Labs

WELL NAME & NUMBER Geo Thermo Res. Pit

TRUCKING CO. Key Energy UNIT NO 842

DRIVER R. Toledo ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	R. Toledo

☐ 60 BARREL ☐ 100 BARREL 80.00

11

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

1240

DATE 10/27/02 CUSTOMER Los Alamos

WELL NAME & NUMBER GEO Thermo

TRUCKING CO. Key UNIT NO 841

DRIVER C Scott ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	C Scott

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE T.C.

Reprographics 049926

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

1218

DATE 10/25/02 CUSTOMER Los Alamos National Lab

WELL NAME & NUMBER GEO Thermo Site

TRUCKING CO. Key UNIT NO 841

DRIVER C Scott ARRIVAL TIME

ORDERED BY Jeff DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	C Scott
80	—	—	—	C Scott

160.00 80 5

☐ 60 BARREL ☐ 100 BARREL

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1241

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10-28-02 CUSTOMER Los Alamos Nat. Labs

WELL NAME & NUMBER Geo Thermo Site

TRUCKING CO. Key Energy UNIT NO 842

DRIVER R. Toledo ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	R. Toledo

☐ 60 BARREL ☐ 100 BARREL 50.00

ATTENDANT'S SIGNATURE J. C

Reprographics 0499261

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1219

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10-25-02 CUSTOMER Los Alamos Labs

WELL NAME & NUMBER Geo Thermo Res. Pit

TRUCKING CO. Key Energy UNIT NO 842

DRIVER R. Toledo ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	R. Toledo

☐ 60 BARREL ☐ 100 BARREL 50.00

6

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc. 1216

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6604

DATE 10-25-02 CUSTOMER Los Alamos Nat. Lab.

WELL NAME & NUMBER Geo Thermo Pit

TRUCKING CO. KEY ENERGY UNIT NO 826

DRIVER R. Schmidt ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	R. Schmidt

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE T. A

Reprographics 049920

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc. 1230

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10/25/02 CUSTOMER LOS ALAMOS NAT LAB

WELL NAME & NUMBER Geo THERMO WELL SITE

TRUCKING CO. Key UNIT NO 840

DRIVER J Gonzales ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—			Jim Gallegos

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE T. A

Reprographics 049926

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1231

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10/25/02 CUSTOMER Los Alamos NAT LAB

WELL NAME & NUMBER Geo THERMO WELL SITE

TRUCKING CO. Key Energy UNIT NO 840

DRIVER J Gallegos ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—			Jon Gallegos

☐ 60 BARREL ☐ 100 BARREL 80. bbl

ATTENDANT'S SIGNATURE J. G.

Reprographics 0499267

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1258

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10-28-02 CUSTOMER Los Alamos Nat. Lab.

WELL NAME & NUMBER Geo Thermo pit

TRUCKING CO. KEY ENERGY UNIT NO 826

DRIVER R. Conrad ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Rudolph Conrad

☐ 60 BARREL ☐ 100 BARREL 80. bbl

~~COMMERCIAL EVAPORATION PIT~~

1251

T-N-T Environmental, Inc.

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE _____ CUSTOMER Los Alamos National Labs

WELL NAME & NUMBER Geo Thermo Site

TRUCKING CO. Key UNIT NO 841

DRIVER Scott ARRIVAL TIME _____

ORDERED BY Jeff DEL. TICKET NO. _____

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Scott

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE T. O.

Reprographics 049925

"COMMERCIAL EVAPORATION PIT"

1250

T-N-T Environmental, Inc.

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10-28-02 CUSTOMER Los Alamos National Labs

WELL NAME & NUMBER Geo Thermo Site

TRUCKING CO. Key Energy UNIT NO 842

DRIVER R. Toledo ARRIVAL TIME _____

ORDERED BY Jeffery DEL. TICKET NO. _____

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	R. Toledo

☐ 60 BARREL ☐ 100 BARREL 80.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

1249

DATE 10-28-02 CUSTOMER Los Alamos Nat. Labs

WELL NAME & NUMBER Geo Thermo Rese pit

TRUCKING CO. Key Energy UNIT NO XJO

DRIVER MC ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				MC

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE T. C.

Reprographics 0499267

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

1242

DATE 10-28-02 CUSTOMER Los Alamos Nat. Labs

WELL NAME & NUMBER Geo Thermo site

TRUCKING CO. Key Energy UNIT NO XJO

DRIVER MC ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				MC

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE T. C.

Reprographics 0499267

"COMMERCIAL EVAPORATION PIT"

1255

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10-28-02 CUSTOMER Los Alamos Nat. Lab.

WELL NAME & NUMBER Geo Thermo pit

TRUCKING CO. Key Energy UNIT NO 826

DRIVER R Salazar ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	R Salazar

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE T. A.

Reprographics 049926T

"COMMERCIAL EVAPORATION PIT"

1259

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10/29/02 CUSTOMER Los Alamos National Labs

WELL NAME & NUMBER Geo Thermo Site

TRUCKING CO. Key UNIT NO 841

DRIVER Cameron Scott ARRIVAL TIME

ORDERED BY DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Cameron Scott
80	—	—	—	Cameron Scott

☐ 60 BARREL ☐ 100 BARREL 160.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1272

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10/30/02 CUSTOMER Los Alamos National Labs

WELL NAME & NUMBER Geo Thermo Site

TRUCKING CO. Key UNIT NO 841

DRIVER Scott ARRIVAL TIME

ORDERED BY Jeff DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Scott
80	—	—	—	Scott

☐ 60 BARREL ☐ 100 BARREL 160.00

ATTENDANT'S SIGNATURE T. C.

Reprographics 049926

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1281

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10-30-02 CUSTOMER Los Alamos National LABS

WELL NAME & NUMBER Geo Thermo Site

TRUCKING CO. Key Energy UNIT NO 842

DRIVER R. Toledo ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	R. Toledo

☐ 60 BARREL ☐ 100 BARREL 80.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1282

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10/30/02 CUSTOMER LOS ALAMOS NAT LAB

WELL NAME & NUMBER Geo THERMO WELL SITE

TRUCKING CO. KEY UNIT NO 840

DRIVER J COLLAGOS ARRIVAL TIME

ORDERED BY JEFFERY DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				
80				

☐ 60 BARREL ☐ 100 BARREL 160.00

ATTENDANT'S SIGNATURE T.A.

Reprographics 049926

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1288

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10-30-02 CUSTOMER Los Alamos Nat. Lab.

WELL NAME & NUMBER Geo Thermo Site

TRUCKING CO. Key Energy UNIT NO 630

DRIVER MC ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				

☐ 60 BARREL ☐ 100 BARREL 80. Key

"COMMERCIAL EVAPORATION PIT"

1289

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10/31/02 CUSTOMER Los Alamos Labs

WELL NAME & NUMBER Geo Thermo Site

TRUCKING CO. Key UNIT NO 841

DRIVER Scott ARRIVAL TIME

ORDERED BY JEFF DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Scott
80	—	—	—	Scott

☐ 60 BARREL ☐ 100 BARREL 160.00

ATTENDANT'S SIGNATURE T. A.

Reprographics 0499261

"COMMERCIAL EVAI ORATION PIT"

1290

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 10-31-02 CUSTOMER Los Alamos Nat. Lab.

WELL NAME & NUMBER Geo Thermo pit

TRUCKING CO. Key Energy UNIT NO 1540

DRIVER R. Salvail ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	R. Salvail

☐ 60 BARREL ☐ 100 BARREL 80.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

1313

DATE 11-1-02 CUSTOMER Los Alamos Nat. Labs.

WELL NAME & NUMBER Geo Thermo Site

TRUCKING CO. Key Energy UNIT NO 820

DRIVER MC ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	M. Gallo

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE T. A.

Reprographics 0499261

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

1312

DATE 11/1/02 CUSTOMER Los Alamos Labs

WELL NAME & NUMBER Geo Therm Site

TRUCKING CO. Key UNIT NO 841

DRIVER C Scott ARRIVAL TIME

ORDERED BY Jeff DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	C Scott

☐ 60 BARREL ☐ 100 BARREL 80.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

1311

DATE 11-1-02 CUSTOMER Los Alamos Nat. Lab.

WELL NAME & NUMBER Geo Thermo pit

TRUCKING CO. Key Energy UNIT NO 1540

DRIVER R. Eaton ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Rudolph Eaton
80	—	—	—	Rudolph Eaton

☐ 60 BARREL ☐ 100 BARREL 160.00

ATTENDANT'S SIGNATURE T. A.

Reprographics 0499261

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

1310

DATE CUSTOMER LOS ALAMOS NAT LABS

WELL NAME & NUMBER Geo Thermo Well Site

TRUCKING CO. Key Energy UNIT NO 8477

DRIVER J Gallegos ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	J Gallegos
80	—	—	—	J Gallegos

☐ 60 BARREL ☐ 100 BARREL 160.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1346

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11-4-02 CUSTOMER Los Alamos Nat. LABS

WELL NAME & NUMBER Geo Thermo Site

TRUCKING CO. Key UNIT NO 842

DRIVER R. Toledo ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Ricky Toledo

☐ 60 BARREL ☐ 100 BARREL 80. Ev

ATTENDANT'S SIGNATURE T. C.

Reprographics 0499267

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1343

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11/4/02 CUSTOMER LOS ALAMOS NAT LAB

WELL NAME & NUMBER GEO THERMA WELL SITE

TRUCKING CO. KEY ENERGY UNIT NO 340

DRIVER J GONZALES ARRIVAL TIME

ORDERED BY Ke Frey DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Jose Gallegos

☐ 60 BARREL ☐ 100 BARREL 80. AV

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1337

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11/4/02 CUSTOMER LOS ALAMOS NAT LAB

WELL NAME & NUMBER GEO THERMO WELL SITE

TRUCKING CO. KEY ENERGY UNIT NO 840

DRIVER J COLLEGOS ARRIVAL TIME

ORDERED BY JEFFREY DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				Jose Gallegos

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE J. G.

Reprographics 049926

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1344

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11/4/02 CUSTOMER LOS ALAMOS NAT LAB

WELL NAME & NUMBER GEO THERMO WELL SITE

TRUCKING CO. KEY UNIT NO 840

DRIVER J COLLEGOS ARRIVAL TIME

ORDERED BY JEFFREY DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				Jose Gallegos

☐ 60 BARREL ☐ 100 BARREL 80.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc. 1345

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11-4-02 CUSTOMER Los Alamos Nat. lab

WELL NAME & NUMBER Geo Thermo pit

TRUCKING CO. Key Energy UNIT NO 1540

DRIVER R. Schuff ARRIVAL TIME

ORDERED BY Jeff Perry DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Rudolph Schuff
80	—	—	—	Rudolph Schuff

☐ 60 BARREL ☐ 100 BARREL 160 BBL

ATTENDANT'S SIGNATURE T. A.

Reprographics 0499267

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc. 1354

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11/5/02 CUSTOMER LOS ALAMOS NAT LAB

WELL NAME & NUMBER GEO THERMO WELL SITE

TRUCKING CO. K&K UNIT NO 826

DRIVER Scott ARRIVAL TIME

ORDERED BY JEFF PERRY DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Scott
80	—	—	—	Scott

☐ 60 BARREL ☐ 100 BARREL 160 BBL

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1374

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11-6-02 CUSTOMER Los Alamos National LABS

WELL NAME & NUMBER Geo Thermo Site

TRUCKING CO. Key Energy UNIT NO 842

DRIVER R. Toledo ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	R. Tolch

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE J. O.

Reprographics 049926T

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1410

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11/7/02 CUSTOMER LOS ALAMOS NAT LAB

WELL NAME & NUMBER GEO THERMO WELL SITE

TRUCKING CO. KEY ENERGY UNIT NO 840

DRIVER T CHARLES ARRIVAL TIME

ORDERED BY JEFFREY DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—			

☐ 60 BARREL ☐ 100 BARREL 80.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1391

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11-7-02 CUSTOMER Los Alamos Nat. Lab.

WELL NAME & NUMBER Geo Thermo pit

TRUCKING CO. Key Energy UNIT NO 1540

DRIVER R. S. Loral ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	R. Lobo Loral

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE J. A.

Reprographics 0499267

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1411

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11/8/02 CUSTOMER LOS ALAMOS NAT LAB

WELL NAME & NUMBER GEO THERMO WELL SITE

TRUCKING CO. KEY ENERGY UNIT NO 540

DRIVER JAMES COLLEGOS ARRIVAL TIME

ORDERED BY JEFFREY DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	James Collegos

☐ 60 BARREL ☐ 100 BARREL 80.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

1458

DATE 11/12/02 CUSTOMER Los Alamos NAT LAB

WELL NAME & NUMBER GEO THERMO WELL SITE

TRUCKING CO. KEY ENERGY UNIT NO 840

DRIVER J GALLEGOS ARRIVAL TIME

ORDERED BY JEFFREY DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—		—	J Gallegos

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE J. G.

Reprographics 0499267

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.
HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

1461

DATE 11/12/02 CUSTOMER Los Alamos Labs

WELL NAME & NUMBER GEO Thermo Site

TRUCKING CO. KEY UNIT NO 841

DRIVER SCOTT ARRIVAL TIME

ORDERED BY JEFF DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Scott

☐ 60 BARREL ☐ 100 BARREL 80.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1446

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11/12/02 CUSTOMER Los Alamos Nat Lab

WELL NAME & NUMBER Geo Thermo Well Site

TRUCKING CO. K&K UNIT NO 840

DRIVER Gonzales ARRIVAL TIME

ORDERED BY Jeff DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE J. A.

Reprographics 049928

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1467

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11/13/02 CUSTOMER Los Alamos Labs

WELL NAME & NUMBER Geo Site

TRUCKING CO. K&K UNIT NO 841

DRIVER Scott ARRIVAL TIME

ORDERED BY Jeff DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Scott

☐ 60 BARREL ☐ 100 BARREL 80.00

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1464

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11-13-02 CUSTOMER Los Alamos Nat Lab.

WELL NAME & NUMBER Geo Thermo site pit

TRUCKING CO. Key Energy UNIT NO 530

DRIVER N/C ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	[signature]

☐ 60 BARREL ☐ 100 BARREL 80.00

ATTENDANT'S SIGNATURE T. A.

Reprographics 049926T

"COMMERCIAL EVAPORATION PIT"

T-N-T Environmental, Inc.

1482

HCR 74 BOX 113
LINDRITH, NEW MEXICO 87029
PHONE: (505) 774-6504

DATE 11-14-02 CUSTOMER LOS ALAMOS NAT. LAB.

WELL NAME & NUMBER Geo Thermo pit

TRUCKING CO. Key ENERGY UNIT NO 1540

DRIVER R. Ebel ARRIVAL TIME

ORDERED BY Jeffery DEL. TICKET NO.

WATER	P.H.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80	—	—	—	Rudolph Ebel
80	—	—	—	Rudolph Ebel

☐ 60 BARREL ☐ 100 BARREL 160.00

"COMMERCIA . EVAPOR.TIO N PIT"

T-N-T Enviro ıment al, Inc. 1543

HCR 74 BOX 113
LINDRITH, NEW MEXICO 07029
PHONE: (505) 774-6504

DATE 11/20/02 CUSTOMER Los Alamos NAT LAB

WELL NAME & NUMBER GCU Thomas Well Site

TRUCKING CO. Key Energy UNIT NO 840

DRIVER J Gonzales ARRIVAL TIME

ORDERED BY Jeffrey DEL. TICKET NO.

WATER	PH.	H2S	TREAT FOR H2S	DRIVER'S SIGNATURE
80				

☐ 60 BARREL ☐ 100 BARREL 80 bbl

ATTENDANT'S SIGNATURE

Reprographics 040038T

COMMERCIAL LANDFARM TICKET

T-N-T Environmental, Inc.

HCR 74 - Box 113
Lindrith, NM 87029
(505) 774-3504

Ticket No. 2387

ORIGIN:

Operator Los Alamos Labs (Key) Date: 11/19/02

Address Phone

City State Zip

Well Name & No. GCU Thomas Site

Location (Sec., T. & R.)

ANALYSIS:

Chemical Analysis by T-N-T: Yes / No Analysis Attached: Yes / No

Laboratory

Analysis

TRANSPORTER:

Trucking Co. Key Unit No. 841

Delivery Ticket No. [illegible]

Driver [illegible]

Yards	Weight	Drivers Signature	Cell
80	BBLS	[signature]	3
X 7.5			
600 yds			

CORES: White - Landfarm, Yellow - Transporter, Pink & Gold - Operator/Customer

11-19-02

Date

TNT Attendant

COMMERCIAL LANDFARM TICKET

T-N-T Environmental, Inc.

HCR 74 - Box 113
Lindrith, NM 87029
(505) 774-6504

Ticket No. 2386

ORIGIN: Date: 11-14-02

Operator ~~Nelson R George~~ Los Alamos National Lab/ Key

Address _____ Phone _____

City _____ State _____ Zip _____

Well Name & No. Geo Thema well site

Location (Sec., T. & R.) _____

ANALYSIS:

Chemical Analysis by T-N-T: **Yes / No** Analysis Attached: **Yes / No**

Laboratory _____

Analysis _____

TRANSPORTER:

Trucking Co. Key Energy Unit No. 826

Delivery Ticket No. _____

Driver Nelson R. George

Yards	Weight	Drivers Signature	Cell
80 bbls		Nelson R.	2
X7.00			
560.00			

COPIES: White - Landfarm, Yellow - Transporter, Pink & Gold - Operator/Customer

11-14-02 Date — TNT Attendant

COMMERCIAL LANDFARM TICKET

T-N-T Environmental, Inc.

HCR 74 - Box 113
Lindrith, NM 87029
(505) 774-6504

Ticket No 238

ORIGIN: Date: 11/13/0

Operator Labs / Key

Address _____ Phone _____

City _____ State _____ Zip _____

Well Name & No. Geo Thema Well

Location (Sec., T. & R.) _____

ANALYSIS:

Chemical Analysis by T-N-T: **Yes / No** Analysis Attached: **Yes /**

Laboratory _____

Analysis _____

TRANSPORTER:

Trucking Co. Key Energy Unit No. 840

Delivery Ticket No. _____

Driver J Gallegos

Yards	Weight	Drivers Signature	Ce
80	BBLS	James Gallegos	
X $7.00			
560.00			

COPIES: White - Landfarm, Yellow - Transporter, Pink & Gold - Operator/Customer

11-13-02 Date — Vicente Enriquez TNT Attendant

COMMERCIAL LANDFARM TICKET

T-N-T Environmental, Inc.

HCR 74 - Box 113
Lindrith, NM 87029
(505) 774-6504

Ticket No. 2384

ORIGIN: Date: 11/12/02

Operator Labs/Key

Address _____ Phone _____

City Los Alamos State NM Zip _____

Well Name & No. Geo Thermo Site

Location (Sec., T. & R.) _____

ANALYSIS:

Chemical Analysis by T-N-T: **Yes / No** Analysis Attached: **Yes / No**

Laboratory _____

Analysis _____

TRANSPORTER:

Trucking Co. Key Unit No. 841

Delivery Ticket No. _____

Driver Scott

Yards	Weight	Drivers Signature	Cell
80 X 7.00	BBLs	C. Scott	2
560.00			

COPIES: White - Landfarm, Yellow -Transporter, Pink & Gold - Operator/Customer

11-12-02 Vicente Enriquez

Date TNT Attendant

COMMERCIAL LANDFARM TICKET

T-N-T Environmental, Inc.

HCR 74 - Box 113
Lindrith, NM 87029
(505) 774-6504

Ticket I 238

ORIGIN: Date: 11/11/02

Operator Labs/Key

Address _____ Phone _____

City Los Alamos State NM Zip _____

Well Name & No. Geo Thermo Site

Location (Sec., T. & R.) _____

ANALYSIS:

Chemical Analysis by T-N-T: **Yes / No** Analysis Attached: **Yes**

Laboratory _____

Analysis _____

TRANSPORTER:

Trucking Co. Key Unit No. 841

Delivery Ticket No. _____

Driver Scott

Yards	Weight	Drivers Signature	C
	80 BBLs	Scott	
	X 7.00		
560.00			

COPIES: White - Landfarm, Yellow -Transporter, Pink & Gold - Operator/Customer

11-11-02 Vicente Enriquez

Date TNT Attendant

COMMERCIAL LANDFARM TICKET

T-N-T Environmental, Inc.

HCR 74 - Box 113
Lindrith, NM 87029
(505) 774-6504

Ticket No. 2375

IGIN: Date: 11-8-02

erator Labs / key

dress _____ Phone _____

y Los Alamos National Labs State N.M Zip _____

ll Name & No. Geo Thermo Site

cation (Sec., T. & R.) N/A

IALYSIS:

emical Analysis by T-N-T: **Yes / No** Analysis Attached: **Yes / No**

oratory _____

alysis _____

ANSPORTER:

ucking Co. Key Energy Unit No. 842

livery Ticket No. _____

iver Ricky Toledo

Yards	Weight	Drivers Signature	Cell
80	BBLS	R. Toledo	2
-4.00			
560.0			

PIES: White - Landfarm, Yellow -Transporter, Pink & Gold - Operator/Customer

11-8-02 Vicente Enriquez
Date TNT Attendant

COMMERCIAL LANDFARM TICKET

T-N-T Environmental, Inc.

HCR 74 - Box 113
Lindrith, NM 87029
(505) 774-6504

Ticket No. 2383

ORIGIN: Date: 11/11/02

Operator Labs / key

Address _____ Phone _____

City _____ State NM Zip _____

Well Name & No. Geo Thermo Well Site

Location (Sec., T. & R.) _____

ANALYSIS:

Chemical Analysis by T-N-T: **Yes / No** Analysis Attached: **Yes / No**

Laboratory _____

Analysis _____

TRANSPORTER:

Trucking Co. Key Unit No. 840

Delivery Ticket No. _____

Driver Jon Gerding

Yards	Weight	Drivers Signature	Cell
80	BBLS	Jon Gerding	2
x7.0			
560.0			

COPIES: White - Landfarm, Yellow -Transporter, Pink & Gold - Operator/Customer

11-11-02 Vicente Enriquez
Date TNT Attendant

COMMERCIAL LANDFARM TICKET

T-N-T Environmental, Inc.

HCR 74 - Box 113
Lindrith, NM 87029
(505) 774-6504

Ticket No. 2374

GIN:

Date: 11/8/02

rator Labs / Key

ress _____ Phone _____

Los Alamos State NM Zip _____

l Name & No. Geo Thermo Site

ation (Sec., T. & R.) _____

ALYSIS:

mical Analysis by T-N-T: **Yes / No** Analysis Attached: **Yes / No**

oratory _____

lysis _____

_____

ANSPORTER:

cking Co. Key Unit No. 840

ivery Ticket No. _____

/er J Gonzales

ards	Weight	Drivers Signature	Cell
80 BBLs		Tom Gallegos	2
@ 7.00			
560.00			

PIES: White - Landfarm, Yellow -Transporter, Pink & Gold - Operator/Customer

11/8/02 Vicente Enriquez

Date TNT Attendant

COMMERCIAL LANDFARM TICKET

T-N-T Environmental, Inc.

HCR 74 - Box 113
Lindrith, NM 87029
(505) 774-6504

Ticket No. 2373

ORIGIN:

Date: 11/8/02

Operator Labs / Key

Address _____ Phone _____

City Los Alamos State NM Zip _____

Well Name & No. Geo Thermo Site

Location (Sec., T. & R.) _____

ANALYSIS:

Chemical Analysis by T-N-T: **Yes / No** Analysis Attached: **Yes / No**

Laboratory _____

Analysis _____

_____

TRANSPORTER:

Trucking Co. Key Unit No. 840

Delivery Ticket No. _____

Driver Scott

Yards	Weight	Drivers Signature	Cell
80 BBLs		Scott	2
x @ 7.00			
560.00			

COPIES: White - Landfarm, Yellow -Transporter, Pink & Gold - Operator/Customer

11-8-02 Vicente Enriquez

Date TNT Attendant

COMMERCIAL LANDFARM TICKET

T-N-T Environmental, Inc.

HCR 74 - Box 113
Lindrith, NM 87029
(505) 774-6504

Ticket No. 2388

ORIGIN:

Date: 11/15/02

Operator Los Alamos Nat Lab

Address _____ Phone _____

City _____ State NM Zip _____

Well Name & No. Geo Thermo Well Site

Location (Sec., T. & R.) _____

ANALYSIS:

Chemical Analysis by T-N-T: **Yes / No** Analysis Attached: **Yes / No**

Laboratory _____

Analysis _____

TRANSPORTER:

Trucking Co. Key Energy Unit No. 840

Delivery Ticket No. _____

Driver Jim Colleges

Yards	Weight	Drivers Signature	Cell
10	BBLS	James Gallegos	2
MUD	WATER		
9	BBLS	James Gallegos	2
MUD	WATER		
10	BBLS	James Gallegos	2
MUD	WATER		

COPIES: White - Landfarm, Yellow - Transporter, Pink & Gold - Operator/Customer

7.00

11.80.00

11/18/02 Date

James Gallegos TNT Attendant

COMMERCIAL LANDFARM TICKET

T-N-T Environmental, Inc.

HCR 74 - Box 113
Lindrith, NM 87029
(505) 774-6504

Ticket No. 2372

ORIGIN:

Date: 11/7/02

Operator Labs / Key

Address _____ Phone _____

City _____ State NM Zip _____

Well Name & No. Geo Thermo Well Site

Location (Sec., T. & R.) _____

ANALYSIS:

Chemical Analysis by T-N-T: **Yes / No** Analysis Attached: **Yes / No**

Laboratory _____

Analysis _____

TRANSPORTER:

Trucking Co. Key Unit No. 840

Delivery Ticket No. 2372

Driver J Gallegos

Yards	Weight	Drivers Signature	Cell
8.5	BBLS	James Gallegos	2
X $7.00			
560.00			

COPIES: White - Landfarm, Yellow - Transporter, Pink & Gold - Operator/Customer

11-7-02 Date

Vicente Enriquez TNT Attendant

ATTACHMENT 3

Disposal Records

1-MG Service Pond Liners, Geofiber Matting, and Leak Collection Gravel

DRIVER: PLEASE SIGN HERE

TICKET NBR
59803

RIO RANCHO SANITARY LANDFILL

PO BOX 15709
RIO RANCHO, NM 87174

Check 117

HAULER NAME	TRUCK #	OPERATOR	TIME IN	TIME OUT	DATE
OUTCASH / OUTSIDE TR CASH ACCOUNT	OUTCASH2	IN: c1 OUT: C1	16:16	16:16	11/19/2002

ORIGIN: RIO / ALBUQUERQUE
LICENSE: COMMERCIAL
ROUTE: NM / Non Spp
MANIFEST:
COMMENT:
P.O.:

Fentm Cash

SOURCES | OTHER INFORMATION

Weight
Truck # OUTCASH2 0 GROSS: 0 LBS
Box ID 0 TARE: 0 LBS
Calc Tare NET: 0 LBS

WM MANAGEMENT

MATERIAL CODE/DESCRIPTION	QUANTITY	MEASURE	RATE	AMOUNT
WASTE	QUANTITY UNIT	RATE	TAX	AMOUNT
RIO / COMMERCIAL TARP BY YARDS	7.00 Y	$ 4.24	$ 1.84	$ 29.68
CASH IN: 31.52 CHANGE: $ 0.00			$ R: RDLE	31.52

Envirotech, Inc.
5796 Hwy 64
Farmington, NM 87401

505-632-0615 Phone Number
505-632-1865 Fax Number

Invoice Number: 7589
November 30, 2002

Invoice

To: Key Energy
PO Box 900
Farmington, NM 87499-0900

Job: 98065-008

Acceptance of sludge/water from LANL's geothermal project

Job Manager: Harlan Brown

OPSD 1/6/03

Professional Services for the Period: 11/01/02 to 11/30/02

Billing Group: 001 Cost Plus

November 30, 2002
Invoice: 7589

Attn: Randy Blackman

Landfarm Services

Expense Code	Date	Bill Units	Unit Bill Rate	BillUnitCharge
Contaminated Soil Acceptance	11/18/02	25.00 CY	$18.00	$450.00
BOL # 20262 ~ Pond sediment ~ via L&R Oil Services				

Landfarm Services Totals: $450.00

Billing Group Subtotal:	$450.00
Billing Group Fees	0.00
New Mexico Gross Receipts Tax:	$25.88
Billing Group Total:	$475.88

Project Totals:

Project Subtotal:	$450.00
NM Gross Receipts Tax:	$25.88
Billing Total:	$475.88

ATTACHMENT 4

Photographs

1-MG Service Pond Closure Activites


4X4


E-24424

ATTACHMENT 5

NORM Survey Results

1-MG Service Pond Leak Collection Piping

Los Alamos
National Laboratory

Radioactivity Screening Results
1-MG Pond Leak Collection Piping

12/19/2002

Survey Location	Log Date	Probe S/N	Log Mode	Channel Type	Reading	Gross/Net	Units	E-600 S/N	uR/h
1	11/20/2002	13085	Ratemeter	Gamma	1.03E-05	Gross	R/hr	12066	1.03E+01
2	11/20/2002	13085	Ratemeter	Gamma	1.12E-05	Gross	R/hr	12066	1.12E+01
3	11/20/2002	13085	Ratemeter	Gamma	1.18E-05	Gross	R/hr	12066	1.18E+01
4	11/20/2002	13085	Ratemeter	Gamma	1.48E-05	Gross	R/hr	12066	1.48E+01
5	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
6	11/20/2002	13085	Ratemeter	Gamma	1.24E-05	Gross	R/hr	12066	1.24E+01
7	11/20/2002	13085	Ratemeter	Gamma	1.22E-05	Gross	R/hr	12066	1.22E+01
8	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
9	11/20/2002	13085	Ratemeter	Gamma	1.17E-05	Gross	R/hr	12066	1.17E+01
10	11/20/2002	13085	Ratemeter	Gamma	1.17E-05	Gross	R/hr	12066	1.17E+01
11	11/20/2002	13085	Ratemeter	Gamma	1.17E-05	Gross	R/hr	12066	1.17E+01
12	11/20/2002	13085	Ratemeter	Gamma	1.23E-05	Gross	R/hr	12066	1.23E+01
13	11/20/2002	13085	Ratemeter	Gamma	1.26E-05	Gross	R/hr	12066	1.26E+01
14	11/20/2002	13085	Ratemeter	Gamma	1.27E-05	Gross	R/hr	12066	1.27E+01
15	11/20/2002	13085	Ratemeter	Gamma	1.18E-05	Gross	R/hr	12066	1.18E+01
16	11/20/2002	13085	Ratemeter	Gamma	1.21E-05	Gross	R/hr	12066	1.21E+01
17	11/20/2002	13085	Ratemeter	Gamma	1.18E-05	Gross	R/hr	12066	1.18E+01
18	11/20/2002	13085	Ratemeter	Gamma	1.16E-05	Gross	R/hr	12066	1.16E+01
19	11/20/2002	13085	Ratemeter	Gamma	1.15E-05	Gross	R/hr	12066	1.15E+01
20	11/20/2002	13085	Ratemeter	Gamma	1.15E-05	Gross	R/hr	12066	1.15E+01
21	11/20/2002	13085	Ratemeter	Gamma	1.15E-05	Gross	R/hr	12066	1.15E+01
22	11/20/2002	13085	Ratemeter	Gamma	1.14E-05	Gross	R/hr	12066	1.14E+01
23	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
24	11/20/2002	13085	Ratemeter	Gamma	1.22E-05	Gross	R/hr	12066	1.22E+01
25	11/20/2002	13085	Ratemeter	Gamma	1.23E-05	Gross	R/hr	12066	1.23E+01
26	11/20/2002	13085	Ratemeter	Gamma	1.24E-05	Gross	R/hr	12066	1.24E+01
27	11/20/2002	13085	Ratemeter	Gamma	1.26E-05	Gross	R/hr	12066	1.26E+01
28	11/20/2002	13085	Ratemeter	Gamma	1.24E-05	Gross	R/hr	12066	1.24E+01
29	11/20/2002	13085	Ratemeter	Gamma	1.21E-05	Gross	R/hr	12066	1.21E+01
30	11/20/2002	13085	Ratemeter	Gamma	1.17E-05	Gross	R/hr	12066	1.17E+01
31	11/20/2002	13085	Ratemeter	Gamma	1.15E-05	Gross	R/hr	12066	1.15E+01
32	11/20/2002	13085	Ratemeter	Gamma	1.15E-05	Gross	R/hr	12066	1.15E+01
33	11/20/2002	13085	Ratemeter	Gamma	1.12E-05	Gross	R/hr	12066	1.12E+01
34	11/20/2002	13085	Ratemeter	Gamma	1.38E-05	Gross	R/hr	12066	1.38E+01
35	11/20/2002	13085	Ratemeter	Gamma	1.10E-05	Gross	R/hr	12066	1.10E+01
36	11/20/2002	13085	Ratemeter	Gamma	1.11E-05	Gross	R/hr	12066	1.11E+01
37	11/20/2002	13085	Ratemeter	Gamma	1.11E-05	Gross	R/hr	12066	1.11E+01
38	11/20/2002	13085	Ratemeter	Gamma	1.14E-05	Gross	R/hr	12066	1.14E+01
39	11/20/2002	13085	Ratemeter	Gamma	1.13E-05	Gross	R/hr	12066	1.13E+01
40	11/20/2002	13085	Ratemeter	Gamma	1.12E-05	Gross	R/hr	12066	1.12E+01
41	11/20/2002	13085	Ratemeter	Gamma	1.15E-05	Gross	R/hr	12066	1.15E+01
42	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
43	11/20/2002	13085	Ratemeter	Gamma	1.54E-05	Gross	R/hr	12066	1.54E+01
44	11/20/2002	13085	Ratemeter	Gamma	1.46E-05	Gross	R/hr	12066	1.46E+01
45	11/20/2002	13085	Ratemeter	Gamma	1.21E-05	Gross	R/hr	12066	1.21E+01
46	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
47	11/20/2002	13085	Ratemeter	Gamma	1.18E-05	Gross	R/hr	12066	1.18E+01
48	11/20/2002	13085	Ratemeter	Gamma	1.17E-05	Gross	R/hr	12066	1.17E+01
49	11/20/2002	13085	Ratemeter	Gamma	1.15E-05	Gross	R/hr	12066	1.15E+01
50	11/20/2002	13085	Ratemeter	Gamma	1.15E-05	Gross	R/hr	12066	1.15E+01

Los Alamos
National Laboratory

Radioactivity Screening Results
1-MG Pond Leak Collection Piping

12/19/2002

Survey Location	Log Date	Probe S/N	Log Mode	Channel Type	Reading	Gross/Net	Units	E-600 S/N	uR/h
51	11/20/2002	13085	Ratemeter	Gamma	1.14E-05	Gross	R/hr	12066	1.14E+01
52	11/20/2002	13085	Ratemeter	Gamma	1.17E-05	Gross	R/hr	12066	1.17E+01
53	11/20/2002	13085	Ratemeter	Gamma	1.16E-05	Gross	R/hr	12066	1.16E+01
54	11/20/2002	13085	Ratemeter	Gamma	1.13E-05	Gross	R/hr	12066	1.13E+01
55	11/20/2002	13085	Ratemeter	Gamma	1.13E-05	Gross	R/hr	12066	1.13E+01
56	11/20/2002	13085	Ratemeter	Gamma	1.13E-05	Gross	R/hr	12066	1.13E+01
57	11/20/2002	13085	Ratemeter	Gamma	1.14E-05	Gross	R/hr	12066	1.14E+01
58	11/20/2002	13085	Ratemeter	Gamma	1.16E-05	Gross	R/hr	12066	1.16E+01
59	11/20/2002	13085	Ratemeter	Gamma	1.41E-05	Gross	R/hr	12066	1.41E+01
60	11/20/2002	13085	Ratemeter	Gamma	1.29E-05	Gross	R/hr	12066	1.29E+01
61	11/20/2002	13085	Ratemeter	Gamma	1.26E-05	Gross	R/hr	12066	1.26E+01
62	11/20/2002	13085	Ratemeter	Gamma	1.23E-05	Gross	R/hr	12066	1.23E+01
63	11/20/2002	13085	Ratemeter	Gamma	1.21E-05	Gross	R/hr	12066	1.21E+01
64	11/20/2002	13085	Ratemeter	Gamma	1.16E-05	Gross	R/hr	12066	1.16E+01
65	11/20/2002	13085	Ratemeter	Gamma	1.14E-05	Gross	R/hr	12066	1.14E+01
66	11/20/2002	13085	Ratemeter	Gamma	1.15E-05	Gross	R/hr	12066	1.15E+01
67	11/20/2002	13085	Ratemeter	Gamma	1.17E-05	Gross	R/hr	12066	1.17E+01
68	11/20/2002	13085	Ratemeter	Gamma	1.16E-05	Gross	R/hr	12066	1.16E+01
69	11/20/2002	13085	Ratemeter	Gamma	1.16E-05	Gross	R/hr	12066	1.16E+01
70	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
71	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
72	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
73	11/20/2002	13085	Ratemeter	Gamma	1.14E-05	Gross	R/hr	12066	1.14E+01
74	11/20/2002	13085	Ratemeter	Gamma	1.14E-05	Gross	R/hr	12066	1.14E+01
75	11/20/2002	13085	Ratemeter	Gamma	1.17E-05	Gross	R/hr	12066	1.17E+01
76	11/20/2002	13085	Ratemeter	Gamma	1.17E-05	Gross	R/hr	12066	1.17E+01
77	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
78	11/20/2002	13085	Ratemeter	Gamma	1.20E-05	Gross	R/hr	12066	1.20E+01
79	11/20/2002	13085	Ratemeter	Gamma	1.26E-05	Gross	R/hr	12066	1.26E+01
80	11/20/2002	13085	Ratemeter	Gamma	1.26E-05	Gross	R/hr	12066	1.26E+01
81	11/20/2002	13085	Ratemeter	Gamma	1.26E-05	Gross	R/hr	12066	1.26E+01
82	11/20/2002	13085	Ratemeter	Gamma	1.27E-05	Gross	R/hr	12066	1.27E+01
83	11/20/2002	13085	Ratemeter	Gamma	1.28E-05	Gross	R/hr	12066	1.28E+01
84	11/20/2002	13085	Ratemeter	Gamma	1.27E-05	Gross	R/hr	12066	1.27E+01
85	11/20/2002	13085	Ratemeter	Gamma	1.27E-05	Gross	R/hr	12066	1.27E+01
86	11/20/2002	13085	Ratemeter	Gamma	1.25E-05	Gross	R/hr	12066	1.25E+01
87	11/20/2002	13085	Ratemeter	Gamma	1.26E-05	Gross	R/hr	12066	1.26E+01
88	11/20/2002	13085	Ratemeter	Gamma	1.24E-05	Gross	R/hr	12066	1.24E+01
89	11/20/2002	13085	Ratemeter	Gamma	1.22E-05	Gross	R/hr	12066	1.22E+01
90	11/20/2002	13085	Ratemeter	Gamma	1.22E-05	Gross	R/hr	12066	1.22E+01
91	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
92	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
93	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
94	11/20/2002	13085	Ratemeter	Gamma	1.18E-05	Gross	R/hr	12066	1.18E+01
95	11/20/2002	13085	Ratemeter	Gamma	1.19E-05	Gross	R/hr	12066	1.19E+01
96	11/20/2002	13085	Ratemeter	Gamma	1.22E-05	Gross	R/hr	12066	1.22E+01
97	11/20/2002	13085	Ratemeter	Gamma	1.25E-05	Gross	R/hr	12066	1.25E+01
98	11/20/2002	13085	Ratemeter	Gamma	1.27E-05	Gross	R/hr	12066	1.27E+01
99	11/20/2002	13085	Ratemeter	Gamma	1.26E-05	Gross	R/hr	12066	1.26E+01
100	11/20/2002	13085	Ratemeter	Gamma	1.12E-05	Gross	R/hr	12066	1.12E+01
								Avg	1.20E+01
								Max	1.54E+01

ATTACHMENT 6

U.S. Forest Service Letter

Request for Soil Sampling

United States Department of Agriculture | Forest Service | Santa Fe National Forest | 1474 Rodeo Road
P.O. Box 1689
Santa Fe, New Mexico 87504-1689
505-438-7840 FAX 505-438-7834

File Code: 6740
Date: September 27, 2002

Bob Beers
Water Quality & Hydrology Group
Los Alamos National Laboratory
P.O. Box 1663
Los Alamos, NM 87545

Dear Mr. Beers,

Thank you for forwarding us the *Closure Plan for the Fenton Hill Geothermal 1-mg Service Pond and the EE-2A Production Well,* document LA-UR-02-5009 of August 2002, for our review. We would like to comment on sections 9.0, 5.1, 5.2, 5.3.2 and 6.1.

The Santa Fe National Forest requests copies of the manifests associated with the disposal of the service pond waste water and sludge. The DOT manifests, signed by the disposal facility upon receipt of the transport, should be submitted to Carol Linn, Forest Hazardous Materials Coordinator.

The Forest Service requests that confirmation samples be taken to assure that contamination has not occurred in the gravel material that serves as the leak detection system and the soils beneath the secondary liner. A minimum of two samples shall be taken of each layer. If there is any visual evidence of leakage, as stated in Section 6.1, the suspect material shall also be sampled.

The analysis shall be for those contaminates identified in 40 CFR Chapter 1, Section 261.24, as tested in March 2002.

The Santa Fe National Forest staff would like to be present when the actual excavation, grading and re-contouring of the area is performed. Any areas that will remain at the existing ground elevations shall be scarified to enhance germination of the seed, prior to the top soiling operations. Please contact Anne Ferrell (505-829-3535) of the Jemez Ranger District with your schedule of operations.

Thank you for your cooperation.

Sincerely,

LEONARD ATENCIO
Forest Supervisor

cc: Anne Ferrell, Marcia Miolano, Carol Linn, John F Peterson, Patrick Leyba

ATTACHMENT 7

Sampling and Analysis Plan
for
Soil Sampling Beneath the Pond's Liners

Sampling and Analysis Plan

for Closure of the 1.0 Million Gallon Service Pond,

AOC 57-004(a),

at the Fenton Hill Geothermal Site

1.0 Introduction

Los Alamos National Laboratory intends to close the 1-million gallon (1-MG) service pond and the EE-2A geothermal production well associated with the Hot Dry Pock (HDR) Geothermal Project at the Technical Area (TA) –57 Fenton Hill Site. ` A requisite part of this closure is sampling the soils beneath the 1-MG pond to confirm that any potential contamination that may have leaked through the pond liners was removed, and that the remaining soil poses no significant threat to human health or the environment.

2.0 Background

2.1 Sample Collection and Analyses

On August 15-16, 1994, surface and shallow subsurface soil samples were collected from the Fenton Hill geothermal site. Specifically, two subsurface samples were collected from depths of 5.25-6.0 ft and 6.0-7.0 ft approximately 40 ft east of the eastern berm of the 1MG pond. (Historically, this location was part of the 1 MG Pond.) These samples were field screened for radioactivity using an ESP-1beta/gamma meter with an HP 260 pancake probe and for volatile organics using an Hnu photo-ionization detector. In addition, gross alpha and gross beta activities of these samples were determined by gas proportional counting on a Berthold Counter at the LANL ESH-19 Counting Facility. Additionally, these two samples were analyzed for inorganics (using EPA-SW 846 Method 3010) and semi-volatile organic chemicals..

2.2 Analytical Results

All radioactivity counts yielded results at background levels. No volatile organics were detected during field screening. Inorganic analyses yielded metals concentrations above background; however, all concentrations were bounded vertically, ie diminishing with depth, and no metals were detected above background at the 7.0 ft depth.

No organic chemicals were detected in the two samples. Organic content of the two samples was high. The samples were collected from a soil horizon obviously contaminated with dark gray drilling muds and fluid. Because of high organic content in these samples, it was necessary to dilute the samples before analysis, resulting in elevated detection limits. A similar service pond, GTP-2 was sampled and no organic chemicals were detected.

2.3 Regulatory Framework

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). For this reason, the 1MG Pond is not listed in the Laboratory Hazardous and Solid Waste Amendments (HSWA) Permit. The investigation conducted in 1994 followed the requirements of HSWA Module VIII of the RCRA Permit to ensure that all environmental problems are investigated in a consistent manner. It should be emphasized that no RCRA hazardous constituents were found at levels above screening action levels in samples collected from the 1MG Pond and that the site was recommended for No Further Action (NFA) at that time.

The geothermal exploration and development activities at Fenton Hill are regulated by the Oil Conservation Division of the Energy, Minerals, and Natural Resources Department of the State of New Mexico.

3.0 Approach and Implementation

A sufficient number of samples will be collected 1) to perform a human health screening assessment, and 2) to define the nature and extent of any potential contamination encountered. Based on the previous characterization and sampling activities at the 1MG Pond, a minimum of five sets of inorganic and one set of organic chemical samples will be analyzed.

Samples will be collected for two purposes; 1) screening and 2) confirmation.

A combination of biased and random sampling will be performed. After the primary liner, leak detection system, and secondary pond liners are removed, a visual inspection of the berms and bottom of the pond will be made, with emphasis on those locations where influent and effluent lines penetrated the secondary liner and along those lines where the pond liner was lapped and seams in the liner were welded. If indications of leakage are observed, ie staining, odors, erosion from flowing fluids, etc, the location will be marked with pin flags for subsequent sampling. A "biased" set of samples will be collected from each flagged location, up to six locations.

If no evidence of leakage is observed, five sets of samples will be collected from the pond, one set at the center of the pond, 2 sets taken 10 ft from the center on either side of the center point along a N-S transect of the pond, and 2 sets taken 90 ft from the center on either side of the center along an E-W transect of the pond. A diagram showing the approximate location of

sample points is attached (See Figure 1). If fewer than six "stained" areas are identified, a mix of biased and random samples will be collected totaling six samples.

A set of two samples will be collected from each location selected for sampling. The set will consist of samples taken at two depths, to enable determining a trend of increasing or decreasing contamination with depth. One soil sample will be taken from the surface and a second sample will be taken 2 ft beneath the surface sample. Surface samples will be collected using a stainless-steel scoop and digging the soil to a depth of 0 to six inches. The soil will be placed in a clean stainless-steel bowl, homogenized, and the two sample aliquots will be prepared. Subsurface samples will be collected using the Simco trailer mounted sampling rig. The core barrel will be drilled to a depth of two feet below-ground-surface and the core will be collected. The sampling team will open the core barrel, place the core collected from 18 to 24 inch depth in a clean stainless-steel bowl, homogenize the sample and prepare two sample aliquots for analysis.

3.1 Samples for Inorganic Chemical Analysis

As each location is sampled, a sufficient volume (approximately 0.5 liters) of soil will be collected and homogenized in a clean stainless steel bowl to permit splitting and filling two 125 ml Nalgene sample bottles for inorganic chemical analysis. One of the sample bottles will be analyzed for screening purposes by the EES-6, Hydrology, Geochemistry and Geology Laboratory, and will be used to direct cleanup of the 1 MG Pond; the split will be submitted to the ER Project Sample Management Office for storage up to a six-month period, when it may be shipped to a contract laboratory for analyses.

3.2 Samples for Organic Chemical Analysis

One set of samples for organic chemical analysis will be collected. If an indication of leakage is noted, the organic samples will be collected from that location. In the absence of evidence of leakage, the area sampled for organic chemical analysis will be randomly selected from the five locations in Figure 1. The set will consist of samples taken at two depths, to enable determining a trend of increasing or decreasing contamination with depth. One soil sample will be taken from the surface and a second sample will be taken 2 ft beneath the surface sample. Surface samples will be collected using a stainless-steel scoop and digging the soil to a depth of 0 to six inches. The soil will be placed in a clean stainless-steel bowl, homogenized, and the two 125 ml sample aliquots will be placed in clean, clear glass sample bottles.. Subsurface samples will be collected using the Simco trailer mounted sampling rig. The core barrel will be drilled to a depth of two feet below-ground-surface and the

core will be collected. The sampling team will open the core barrel, place the core collected from 18 to 24 inch depth in a clean stainless-steel bowl, homogenize the sample and prepare two 125 ml sample aliquots in clean, clear glass bottles for analysis.

4.0 Interpretation of Analytical Results

The data collected from this campaign will be used by EES Division for purposes of site characterization and assessment of any additional cleanup activities at the 1.0 MG Pond.

ATTACHMENT 8

Analytical Screening Results

Total Metals Analysis
Semi-Volatile Organics Analysis

Los Alamos
National Laboratory

Fenton Hill
1-MG Pond
Underliner Soil Sampling Results

1/7/2003

SOIL SAMPLES														
SAMPLE #	DESCRIPTION	H2O %	Ag ppm	Al ppm	As ppm	Ba ppm	Be ppm	B ppm	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe ppm	Hg ppm	K ppm
RC57-03-49714	surface 0'-6"	6.07	0.20	38626	272	583	2.36	36.4	0.29	9.13	8.05	12.3	15008	1.78	21408
RC57-03-49715	depth 18"-24"	6.05	0.38	57121	23.7	118	2.77	61.1	0.19	1.62	7.07	3.63	10796	1.06	33697
RC57-03-49716	surface 0'-6"	6.25	0.19	34288	197	359	2.14	43.8	0.29	6.72	4.96	9.34	11779	1.08	19357
RC57-03-49717	depth 10"-16"	5.60	0.63	51471	52.5	223	2.50	28.1	0.36	3.75	8.94	6.26	10294	1.97	28617
RC57-03-49718	surface 0'-6"	6.44	0.20	29470	232	354	2.32	33.6	0.30	10.1	8.26	14.1	11392	0.28	20723
RC57-03-49719	depth 18"-24"	5.78	0.20	63868	8.84	91.5	2.51	26.3	0.30	1.71	2.81	3.12	12296	0.29	31064
RC57-03-49720	surface 0'-6"	5.74	0.19	25457	254	287	2.24	67.0	0.19	9.33	7.46	12.1	8462	0.08	20247
RC57-03-49721	depth 18"-24"	6.38	0.40	56837	26.6	492	2.49	52.0	0.00	1.69	4.27	6.16	11759	2.00	27449
RC57-03-49722	surface 0'-6"	8.29	0.20	38856	204	588	2.10	45.7	0.40	7.89	6.39	11.0	12505	0.71	19291
RC57-03-49723	depth 18"-24"	12.48	0.21	60919	8.85	1209	2.19	66.7	0.00	2.19	5.62	16.7	14753	3.45	27925
Soil PRGs		--	380	74000	0.39	5200	150	--	70	4500	210	2800	--	6.5	--

Notes:
Method of Preparation:
EPA 3052, 9mL HNO3 + 3mL HF
NaKCO3 fusion @ 850°C

Los Alamos
National Laboratory

Fenton Hill
1-MG Pond
Underliner Soil Sampling Results

1/7/2003

SAMPLE #	DESCRIPTION	Li ppm	Mg ppm	Mn ppm	Mo ppm	Na ppm	Ni ppm	Pb ppm	Sb ppm	Se ppm	Sn ppm	Th ppm	Tl ppm	U ppm	V ppm	Zn ppm
RC57-03-49714	surface 0'-6"	40.4	5760	2254	6.09	12567	7.86	19.6	15.1	<0.1	1.67	3.14	2.36	1.87	44.2	52.1
RC57-03-49715	depth 18"-24"	38.2	434	503	4.11	22799	2.87	21.0	0.57	<0.1	2.58	2.10	0.48	3.15	8.7	64.0
RC57-03-49716	surface 0'-6"	32.4	4456	1226	4.38	11743	6.52	17.5	0.88	<0.1	1.95	1.27	2.04	1.75	33.1	63.3
RC57-03-49717	depth 10"-16"	29.8	1574	616	5.27	18942	5.54	22.3	0.80	<0.1	2.41	1.34	0.71	2.59	10.7	63.4
RC57-03-49718	surface 0'-6"	34.7	4729	1108	5.85	11740	8.87	19.1	0.81	<0.1	1.71	3.33	2.52	1.71	40.3	53.4
RC57-03-49719	depth 18"-24"	32.4	367	561	3.62	18996	3.32	18.1	0.40	<0.1	2.71	1.71	0.20	2.71	6.4	51.3
RC57-03-49720	surface 0'-6"	36.0	3520	783	5.41	11920	8.49	18.7	0.56	<0.1	1.59	3.17	2.24	1.77	40.1	54.1
RC57-03-49721	depth 18"-24"	28.2	925	587	3.78	15463	4.57	23.9	0.40	<0.1	2.58	1.49	0.50	2.49	11.9	60.6
RC57-03-49722	surface 0'-6"	27.2	3568	1204	4.49	12342	7.29	17.0	0.50	<0.1	1.50	1.50	1.50	1.70	31.0	47.9
RC57-03-49723	depth 18"-24"	36.7	1822	402	3.75	22230	4.48	38.5	1.04	<0.1	2.60	1.25	0.31	2.71	15.6	106
				7800			1500	400	30	380			6.1	23	530	23000

1B
SVOA ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

RC57-03-49726

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 1387S

Matrix: (soil/water) SOIL Lab Sample ID: 70947001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S8L0228

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 9 decanted: (Y/N) N Date Extracted:11/27/02

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
62-75-9	N-Methyl-N-nitrosomethylamin	366	U
110-86-1	Pyridine	366	U
62-53-3	Aniline	366	U
108-95-2	Phenol	366	U
111-44-4	bis(2-Chloroethyl) ether	366	U
95-57-8	2-Chlorophenol	366	U
541-73-1	1,3-Dichlorobenzene	366	U
106-46-7	1,4-Dichlorobenzene	366	U
100-51-6	Benzyl alcohol	366	U
95-50-1	1,2-Dichlorobenzene	366	U
108-60-1	bis(2-Chloroisopropyl)ether	366	U
95-48-7	o-Cresol	366	U
621-64-7	N-Nitrosodipropylamine	366	U
106-44-5	m,p-Cresols	366	U
67-72-1	Hexachloroethane	366	U
78-59-1	Isophorone	366	U
88-75-5	2-Nitrophenol	366	U
105-67-9	2,4-Dimethylphenol	366	U
111-91-1	bis(2-Chloroethoxy)methane	366	U
120-83-2	2,4-Dichlorophenol	366	U
65-85-0	Benzoic acid	733	U
120-82-1	1,2,4-Trichlorobenzene	366	U
91-20-3	Naphthalene	36.6	U
106-47-8	4-Chloroaniline	366	U
87-68-3	Hexachlorobutadiene	366	U
59-50-7	4-Chloro-3-methylphenol	366	U
91-57-6	2-Methylnaphthalene	36.6	U
77-47-4	Hexachlorocyclopentadiene	366	U
88-06-2	2,4,6-Trichlorophenol	366	U
95-95-4	2,4,5-Trichlorophenol	366	U
91-58-7	2-Chloronaphthalene	36.6	U
88-74-4	o-Nitroaniline	366	U
99-09-2	m-Nitroaniline	366	U

1C

SVOA ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

RC57-03-49726

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 1387S

Matrix: (soil/water) SOIL Lab Sample ID: 70947001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S8L0228

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 9 decanted: (Y/N) N Date Extracted:11/27/02

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
131-11-3	Dimethylphthalate	366	U
606-20-2	2,6-Dinitrotoluene	366	U
208-96-8	Acenaphthylene	36.6	U
83-32-9	Acenaphthene	36.6	U
51-28-5	2,4-Dinitrophenol	733	U
132-64-9	Dibenzofuran	366	U
121-14-2	2,4-Dinitrotoluene	366	U
84-66-2	Diethylphthalate	366	U
100-02-7	4-Nitrophenol	366	U
86-73-7	Fluorene	36.6	U
7005-72-3	4-Chlorophenylphenylether	366	U
534-52-1	2-Methyl-4,6-dinitrophenol	366	U
100-01-6	p-Nitroaniline	366	U
122-39-4	Diphenylamine	366	U
122-66-7	Azobenzene	366	U
101-55-3	4-Bromophenylphenylether	366	U
118-74-1	Hexachlorobenzene	366	U
87-86-5	Pentachlorophenol	366	U
85-01-8	Phenanthrene	36.6	U
120-12-7	Anthracene	36.6	U
84-74-2	Di-n-butylphthalate	366	U
206-44-0	Fluoranthene	36.6	U
129-00-0	Pyrene	36.6	U
85-68-7	Butylbenzylphthalate	366	U
56-55-3	Benzo(a)anthracene	36.6	U
91-94-1	3,3'-Dichlorobenzidine	366	U
218-01-9	Chrysene	36.6	U
117-81-7	bis(2-Ethylhexyl)phthalate	189	J
117-84-0	Di-n-octylphthalate	202	J
205-99-2	Benzo(b)fluoranthene	36.6	U
207-08-9	Benzo(k)fluoranthene	36.6	U
50-32-8	Benzo(a)pyrene	36.6	U
193-39-5	Indeno(1,2,3-cd)pyrene	36.6	U

1C

SVOA ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

RC57-03-49726

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 1387S

Matrix: (soil/water) SOIL Lab Sample ID: 70947001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S8L0228

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 9 decanted: (Y/N) N Date Extracted:11/27/02

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
53-70-3	Dibenzo(a,h)anthracene	36.6	U
191-24-2	Benzo(ghi)perylene	36.6	U

1F

EPA SAMPLE NO.

SVOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

RC57-03-49726

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 1387S

Matrix: (soil/water) SOIL Lab Sample ID: 70947001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S8L0228

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 9 decanted: (Y/N) N Date Extracted:11/27/02

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

Number TICs found: 24

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	1.71	622	JB
2.	110-82-7	CYCLOHEXANE	1.99	1200	NJB
3.		UNKNOWN	2.78	365	JB
4.		UNKNOWN ALDOL CONDENSATE	2.92	3650	JBA
5.		UNKNOWN	3.32	173	JB
6.	1921-70-6	PENTADECANE, 2,6,10,14-TETRA	6.58	434	NJ
7.	593-45-3	OCTADECANE	6.85	256	NJ
8.	629-92-5	NONADECANE	7.11	228	NJ
9.	112-95-8	EICOSANE	7.35	158	NJ
10.		UNKNOWN	7.98	306	J
11.		UNKNOWN	7.99	286	J
12.		UNKNOWN	8.02	404	J
13.		UNKNOWN	8.03	301	J
14.		UNKNOWN	8.06	496	J
15.		UNKNOWN	8.11	222	J
16.		UNKNOWN	8.13	280	J
17.		UNKNOWN	8.15	316	J
18.		UNKNOWN	8.19	758	J
19.		UNKNOWN	8.24	232	J
20.		UNKNOWN	8.28	338	J
21.		UNKNOWN	8.30	360	J
22.		UNKNOWN	8.36	310	J
23.		UNKNOWN	8.43	391	J
24.		UNKNOWN	8.49	295	J
25.					
26.					
27.					
28.					
29.					
30.					

1B

SVOA ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

RC57-03-49727

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 1387S

Matrix: (soil/water) SOIL Lab Sample ID: 70947002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S8L0229

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 11 decanted: (Y/N) N Date Extracted:11/27/02

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
62-75-9	N-Methyl-N-nitrosomethylamin	373	U
110-86-1	Pyridine	373	U
62-53-3	Aniline	373	U
108-95-2	Phenol	373	U
111-44-4	bis(2-Chloroethyl) ether	373	U
95-57-8	2-Chlorophenol	373	U
541-73-1	1,3-Dichlorobenzene	373	U
106-46-7	1,4-Dichlorobenzene	373	U
100-51-6	Benzyl alcohol	373	U
95-50-1	1,2-Dichlorobenzene	373	U
108-60-1	bis(2-Chloroisopropyl)ether	373	U
95-48-7	o-Cresol	373	U
621-64-7	N-Nitrosodipropylamine	373	U
106-44-5	m,p-Cresols	373	U
67-72-1	Hexachloroethane	373	U
78-59-1	Isophorone	373	U
88-75-5	2-Nitrophenol	373	U
105-67-9	2,4-Dimethylphenol	373	U
111-91-1	bis(2-Chloroethoxy)methane	373	U
120-83-2	2,4-Dichlorophenol	373	U
65-85-0	Benzoic acid	747	U
120-82-1	1,2,4-Trichlorobenzene	373	U
91-20-3	Naphthalene	37.3	U
106-47-8	4-Chloroaniline	373	U
87-68-3	Hexachlorobutadiene	373	U
59-50-7	4-Chloro-3-methylphenol	373	U
91-57-6	2-Methylnaphthalene	37.3	U
77-47-4	Hexachlorocyclopentadiene	373	U
88-06-2	2,4,6-Trichlorophenol	373	U
95-95-4	2,4,5-Trichlorophenol	373	U
91-58-7	2-Chloronaphthalene	37.3	U
88-74-4	o-Nitroaniline	373	U
99-09-2	m-Nitroaniline	373	U

1C

SVOA ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

RC57-03-49727

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 1387S

Matrix: (soil/water) SOIL Lab Sample ID: 70947002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S8L0229

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 11 decanted: (Y/N) N Date Extracted:11/27/02

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
131-11-3	Dimethylphthalate	373	U
606-20-2	2,6-Dinitrotoluene	373	U
208-96-8	Acenaphthylene	37.3	U
83-32-9	Acenaphthene	37.3	U
51-28-5	2,4-Dinitrophenol	747	U
132-64-9	Dibenzofuran	373	U
121-14-2	2,4-Dinitrotoluene	373	U
84-66-2	Diethylphthalate	373	U
100-02-7	4-Nitrophenol	373	U
86-73-7	Fluorene	37.3	U
7005-72-3	4-Chlorophenylphenylether	373	U
534-52-1	2-Methyl-4,6-dinitrophenol	373	U
100-01-6	p-Nitroaniline	373	U
122-39-4	Diphenylamine	373	U
122-66-7	Azobenzene	373	U
101-55-3	4-Bromophenylphenylether	373	U
118-74-1	Hexachlorobenzene	373	U
87-86-5	Pentachlorophenol	373	U
85-01-8	Phenanthrene	37.3	U
120-12-7	Anthracene	37.3	U
84-74-2	Di-n-butylphthalate	373	U
206-44-0	Fluoranthene	37.3	U
129-00-0	Pyrene	37.3	U
85-68-7	Butylbenzylphthalate	373	U
56-55-3	Benzo(a)anthracene	37.3	U
91-94-1	3,3'-Dichlorobenzidine	373	U
218-01-9	Chrysene	37.3	U
117-81-7	bis(2-Ethylhexyl)phthalate	250	J
117-84-0	Di-n-octylphthalate	373	U
205-99-2	Benzo(b)fluoranthene	37.3	U
207-08-9	Benzo(k)fluoranthene	37.3	U
50-32-8	Benzo(a)pyrene	37.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	37.3	U

1C

SVOA ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

RC57-03-49727

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 1387S

Matrix: (soil/water) SOIL Lab Sample ID: 70947002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S8L0229

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 11 decanted: (Y/N) N Date Extracted:11/27/02

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
53-70-3	Dibenzo(a,h)anthracene	37.3	U
191-24-2	Benzo(ghi)perylene	37.3	U

1F

SVOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

RC57-03-49727

Lab Name: GENERAL ENGINEERING LABOR Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: 1387S

Matrix: (soil/water) SOIL Lab Sample ID: 70947002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S8L0229

Level: (low/med) LOW Date Received: 11/20/02

% Moisture: 11 decanted: (Y/N) N Date Extracted:11/27/02

Concentrated Extract Volume: 1.00(mL) Date Analyzed: 12/02/02

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

Number TICs found: 30

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN ALDOL CONDENSATE	2.92	4380	JBA
2.	544-76-3	HEXADECANE	6.26	1320	NJ
3.	593-45-3	OCTADECANE	6.86	1190	NJ
4.		UNKNOWN	6.96	831	J
5.	6418-44-6	HEPTADECANE, 3-METHYL-	7.04	706	NJ
6.		UNKNOWN ALKANE	7.08	969	J
7.	629-92-5	NONADECANE	7.11	1270	NJ
8.	1786-12-5	CYCLOTETRADECANE, 1,7,11-TRI	7.18	659	NJ
9.		UNKNOWN ALKANE	7.21	935	J
10.		UNKNOWN ALKANE	7.31	667	J
11.		UNKNOWN	7.34	657	J
12.	112-95-8	EICOSANE	7.35	982	NJ
13.		UNKNOWN	7.39	718	J
14.		UNKNOWN ALKANE	7.44	1050	J
15.		UNKNOWN ALKANE	7.50	754	J
16.		UNKNOWN ALKANE	7.51	685	J
17.	629-94-7	HENEICOSANE	7.58	1060	NJ
18.		UNKNOWN ALKANE	7.60	669	J
19.		UNKNOWN ALKANE	7.64	717	J
20.		UNKNOWN	7.71	827	J
21.	629-97-0	DOCOSANE	7.79	808	NJ
22.	638-36-8	HEXADECANE, 2,6,10,14-TETRAM	7.85	1460	NJ
23.	3386-33-2	OCTADECANE, 1-CHLORO-	8.02	898	NJ
24.		UNKNOWN ALKANE	8.07	1300	J
25.		UNKNOWN ALKANE	8.15	905	J
26.		UNKNOWN	8.28	1150	J
27.	20175-84-2	[1,2'-BINAPHTHALENE]-5,5',8,	8.34	1500	NJ
28.		UNKNOWN	8.42	1300	J
29.		UNKNOWN	8.51	1070	J
30.		UNKNOWN ALKANE	8.81	1020	J

ATTACHMENT 9

Analytical Results

TCLP Metals Analysis

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow

Certificate of Analysis

Company: Los Alamos National Lab
Address: PO Box 1663
TA-3, Bldg. 271, Drop Pt. 01U
Los Alamos, New Mexico 87545
Contact: Keith Greene
Project: LANL ER Contract

Report Date: December 13, 2002
Page 1 of 2

Client Sample ID: RC57.03.49714
Sample ID: 717640(01)
Matrix: Soil
Collect Date: 18-NOV-02 00:00
Receive Date: 06-DEC-02
Collector: Client

Project: LANL00101
Client ID: LANL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis Federal											
TCLP Hg in Solid											
Metals Analysis-ICPMS Federal											
TCLP ICP-MS Metals for Soil											
Arsenic		0.120	0.0183	0.030	mg/L	10	PRB	12/11/02	1255	220737	2
Barium		0.824	0.0018	0.020	mg/L	10					
Cadmium	U	ND	0.0009	0.010	mg/L	10					
Chromium	U	ND	0.0103	0.030	mg/L	10					
Lead	U	ND	0.0007	0.020	mg/L	10					
Selenium	J	0.0393	0.010	0.050	mg/L	10					
Silver	U	ND	0.0008	0.010	mg/L	10					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep TCLP Liquid	KHN	12/11/02	1230	220759
SW846 1311	SW846 1311 TCLP Leaching FEDERAL	ETL	12/09/02	1527	219956
SW846 1311	SW846 1311 TCLP Leaching -FEDERAL	ETL	12/09/02	1527	219957
SW846 3010A	TCLP SW 846 3010 Acid Digestion	CWS1	12/10/02	1510	220736

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3010/6020	

Notes:
The Qualifiers in this report are defined as follows:

< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration exceeds instrument calibration range
H Holding time exceeded
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
P The response between the confirmation column and the primary column is >40%D
U Indicates the compound was analyzed for but not detected above the detection limit

GENERAL ENGINEERING LABORATORIES

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Certificate of Analysis

Company: Los Alamos National Lab
Address: PO Box 1663
TA-3, Bldg. 271, Drop Pt. 011
Los Alamos, New Mexico 87545
Contact: Keith Greene
Project: LANL ER Contract

Report Date: December 13, 2002

Client Sample ID: RC57-03-49714
Sample ID: 1176401

Project: LANL00101
Client ID: LANL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

UI Uncertain identification for gamma spectroscopy.
X Lab-specific qualifier - must be fully described in case narrative and data summary package
Y QC Samples were not spiked with this compound.

The above sample is reported on an "as received" basis.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Stacy Griffin.

Reviewed by

GENERAL ENGINEERING LABORATORIES

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Certificate of Analysis

Company : Los Alamos National Lab
Address : PO Box 1663
TA-3, Bldg. 271, Drop Pt. 01U
Los Alamos, New Mexico 87545
Contact: Keith Greene
Project: LANL ER Contract

Report Date: December 13, 2002
Page 1 of 2

Client Sample ID: RC57-03-49720
Sample ID: 71764003
Matrix: Soil
Collect Date: 18-NOV-02 00:00
Receive Date: 06-DEC-02
Collector: Client

Project: LANL00101
Client ID: LANL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis Federal											
TCLP Hg in Solid											
Metals Analysis-ICPMS Federal											
TCLP ICP-MS Metals for Soil											
Arsenic		0.130	0.0183	0.030	mg/L	10	PRB	12/11/02	1325	220737	2
Barium		0.749	0.0016	0.020	mg/L	10					
Cadmium	U	ND	0.0009	0.010	mg/L	10					
Chromium	U	ND	0.0103	0.030	mg/L	10					
Lead	U	ND	0.0007	0.020	mg/L	10					
Selenium	J	0.0475	0.010	0.050	mg/L	10					
Silver	U	ND	0.0008	0.010	mg/L	10					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep TCLP Liquid	KHN	12/11/02	1330	220759
SW846 1311	SW846 1311 TCLP Leaching -FEDERAL	ETL	12/09/02	1527	219956
SW846 1311	SW846 1311 TCLP Leaching -FEDERAL	ETL	12/09/02	1527	219957
SW846 3010A	TCLP SW 846 3010 Acid Digestion	CWS1	12/10/02	1510	220736

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3010/6020	

Notes:
The Qualifiers in this report are defined as follows :

< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration exceeds instrument calibration range
H Holding time exceeded
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
P The response between the confirmation column and the primary column is >40%D
U Indicates the compound was analyzed for but not detected above the detection limit
UI Uncertain identification for gamma spectroscopy.

GENERAL ENGINEERING LABORATORIES

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Certificate of Analysis

Company : Los Alamos National Lab
Address : PO Box 1663
TA-3, Bldg. 271, Drop Pt. 01U
Los Alamos, New Mexico 87545
Contact: Keith Greene
Project: LANL ER Contract

Report Date: December 13, 2002
Page 2 of 2

Client Sample ID: RC57-03-49720
Sample ID. 71764003

Project: LANL00101
Client ID: LANL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst/Date	Time	Batch	Method

X Lab-specific qualifier - must be fully described in case narrative and data summary package
Y QC Samples were not spiked with this compound.

The above sample is reported on an "as received" basis.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Stacy Griffin.

Reviewed by

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Certificate of Analysis

Company: Los Alamos National Lab
Address: PO Box 1663
TA-3, Bldg. 271, Drop Pt. 0111
Los Alamos, New Mexico 87545
Contact: Keith Greene
Project: LANL HR Contract

Report Date: December 13, 2002

Client Sample ID: RCS7-03-49718
Sample ID: 71764002
Matrix: Soil
Collect Date: 18-NOV-02 00:00
Receive Date: 06-DEC-02
Collector: Client

Project: LANL00101
Client ID: LANL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis Federal											
TCLP Hg in Solid											
Metals Analysis-ICPMS Federal											
TCLP ICP-MS Metals for Soil											
Arsenic		0.104	0.0183	0.030	mg/L	10	PRB	12/11/02	1319	220737	2
Barium		0.667	0.0018	0.020	mg/L	10					
Cadmium	U	ND	0.0009	0.010	mg/L	10					
Chromium	U	ND	0.0103	0.030	mg/L	10					
Lead	U	ND	0.0007	0.020	mg/L	10					
Selenium	J	0.0401	0.010	0.050	mg/L	10					
Silver	U	ND	0.0008	0.010	mg/L	10					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep TCLP Liquid	KHN	12/11/02	1230	220759
SW846 1311	SW846 1311 TCLP Leaching -FEDERAL	BTL	12/09/02	1527	219956
SW846 1311	SW846 1311 TCLP Leaching -FEDERAL	BTL	12/09/02	1527	219957
SW846 3010A	TCLP SW 846 3010 Acid Digestion	CWS1	12/10/02	1519	220736

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 7470A	
3	SW846 3010/6020	

Notes:
The Qualifiers in this report are defined as follows :

< Actual result is less than amount reported
> Actual result is greater than amount reported
B Analyte found in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration exceeds instrument calibration range
H Holding time exceeded
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
P The response between the confirmation column and the primary column is >40%D
U Indicates the compound was analyzed for but not detected above the detection limit
UJ Uncertain identification for gamma spectroscopy.

GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow

Certificate of Analysis

Company : Los Alamos National Lab
Address : PO Box 1663
TA-3, Bldg. 271, Drop Pt. 01U
Los Alamos, New Mexico 87545
Contact: Keith Greene
Project: LANL ER Contract

Report Date: December 13, 2002
Page 2 of 2

Client Sample ID: RC57-03-49718
Sample ID: 71764002

Project: LANL00101
Client ID: LANL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method

X Lab-specific qualifier - must be fully described in case narrative and data summary package
Y QC Samples were not spiked with this compound.

The above sample is reported on an "as received" basis.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, Inc. standard operating procedures. Please direct any questions to your Project Manager, Stacy Griffin.

Reviewed by

QC Summary

Report Date: December 13, 2002
Page 1 of 2

Client: Los Alamos National Lab
PO Box 1663
TA-3, Bldg. 271, Drop Pt. 01U
Los Alamos, New Mexico
Contact: Keith Greene

Workorder: 71764

Parameter	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS Federal											
Batch 220737											
QC1200348856 71764001 DUP											
Arsenic			0.120		0.117	mg/L	3 ^		(+/-0.030)	PRB	12/11/02 13:01
Barium			0.824		0.809	mg/L	2		(0%-20%)		
Cadmium		U	ND	U	ND	mg/L	N/A		(+/-0.010)		
Chromium		U	ND	U	ND	mg/L	N/A		(+/-0.030)		
Lead		U	ND	U	ND	mg/L	N/A		(+/-0.020)		
Selenium		J	0.0393	J	0.0444	mg/L	N/A ^		(+/-0.050)		
Silver		U	ND	U	ND	mg/L	N/A		(+/-0.010)		
QC1200348855 LCS											
Arsenic	5.00				5.21	mg/L		104	(80%-120%)		12/11/02 12:49
Barium	10.0				10.5	mg/L		105	(80%-120%)		
Cadmium	1.00				1.04	mg/L		104	(80%-120%)		
Chromium	5.00				5.03	mg/L		101	(80%-120%)		
Lead	5.00				5.52	mg/L		110	(80%-120%)		
Selenium	1.00				1.15	mg/L		115	(80%-120%)		
Silver	0.500				0.560	mg/L		112	(80%-120%)		
QC1200348854 MB											
Arsenic				U	0.030	mg/L					12/11/02 12:43
Barium				U	0.020	mg/L					
Cadmium				U	0.010	mg/L					
Chromium				U	0.030	mg/L					
Lead				U	0.020	mg/L					
Selenium				J	0.0352	mg/L					
Silver				U	0.010	mg/L					
QC1200346781 71764001 MS											
Arsenic	5.26		0.120		5.25	mg/L		98	(75%-125%)		12/11/02 13:07
Barium	10.5		0.824		10.5	mg/L		92	(75%-125%)		
Cadmium	1.05	U	ND		1.00	mg/L		95	(75%-125%)		
Chromium	5.26	U	ND		4.75	mg/L		90	(75%-125%)		
Lead	5.26	U	ND		5.15	mg/L		98	(75%-125%)		
Selenium	1.05	J	0.0393		1.11	mg/L		101	(75%-125%)		
Silver	0.526	U	ND		0.513	mg/L		97	(75% 125%)		
QC1200348858 71764001 SDILT											
Arsenic			12.0	J	2.80	ug/L	16.1				12/11/02 13:13
Barium			82.4		16.9	ug/L	2.54				
Cadmium		U	ND	U	ND	ug/L	N/A				
Chromium		U	ND	U	ND	ug/L	N/A				
Lead		U	ND	U	ND	ug/L	N/A				
Selenium		J	3.93	J	1.40	ug/L	77.5				
Silver		U	ND	U	ND	ug/L	N/A				
QC1200346783 TB											
Arsenic					0.0123	mg/L					12/11/02 12:37
Barium					0.0163	mg/L					

QC Summary

Workorder: 71764

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlyt	Date	Time
Metals Analysis - ICPMS Federal											
Batch 220737											
Cadmium				-0.00149	mg/L						
Chromium				0.00555	mg/L						
Lead				0.0005	mg/L						
Selenium				0.0432	mg/L						
Silver				0.00005	mg/L						

Notes:
RER is calculated at the 95% confidence level (2-sigma).
The Qualifiers in this report are defined as follows:

- < Actual result is less than amount reported
- > Actual result is greater than amount reported
- B Analyte found in the sample as well as the associated blank.
- BD Flag for results below the MDC or a flag for low tracer recovery.
- E Concentration exceeds instrument calibration range
- H Holding time exceeded
- J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.
- P The response between the confirmation column and the primary column is >40%D
- U Indicates the compound was analyzed for but not detected above the detection limit
- UI Uncertain identification for gamma spectroscopy.
- X Lab-specific qualifier - must be fully described in case narrative and data summary package
- Y QC Samples were not spiked with this compound.

N/A Indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

ATTACHMENT 10

Geodetic Survey Results

1-MG Service Pond

Points

Project : Fenton Hill

User name	102698	**Date & Time**	11:16:41 AM 1/16/2003
Coordinate System	Projection from data collector	**Zone**	Zone from data collector
Project Datum	(WGS 84)		
Vertical Datum		**Geoid Model**	GEOID99 (Conus)
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

Point listing

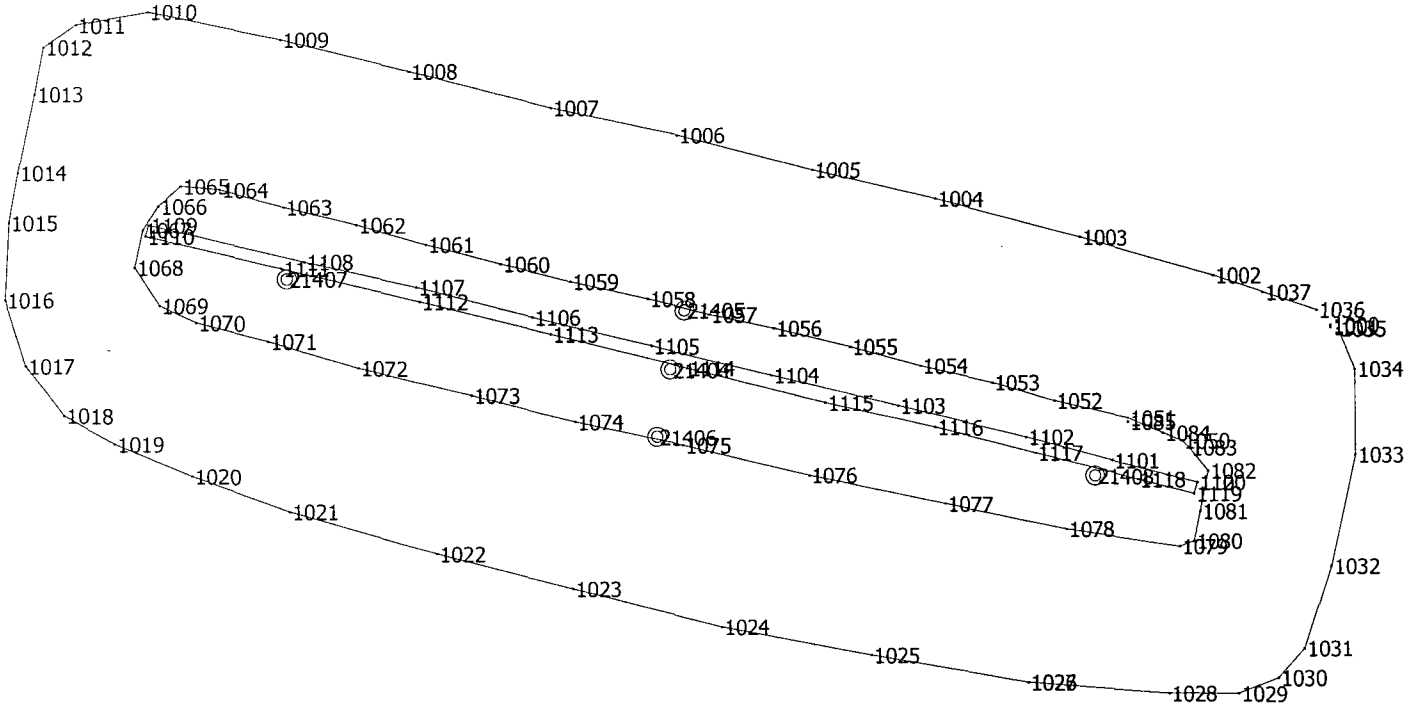
Name	Northing	Easting	Elevation	Feature Code
COT8	1776177.546	1514774.746	8691.918	
1000	1776202.125	1514654.711	8690.722	POND
1001	1776201.750	1514654.705	8690.693	POND
1002	1776211.568	1514631.861	8690.134	POND
1003	1776218.838	1514605.921	8690.255	POND
1004	1776226.215	1514577.909	8690.278	POND
1005	1776231.850	1514553.892	8690.272	POND
1006	1776238.588	1514527.357	8690.345	POND
1007	1776243.944	1514503.033	8690.322	POND
1008	1776250.966	1514475.737	8690.530	POND
1009	1776257.156	1514451.173	8690.713	POND
1010	1776262.606	1514425.698	8690.992	POND
1011	1776260.052	1514412.217	8688.685	POND
1012	1776255.768	1514405.916	8690.777	POND
1013	1776246.684	1514404.255	8690.855	POND
1014	1776231.565	1514401.013	8690.697	POND
1015	1776221.955	1514399.148	8690.638	POND
1016	1776207.119	1514398.319	8690.151	POND
1017	1776194.551	1514402.395	8689.830	POND
1018	1776184.990	1514409.681	8689.983	POND
1019	1776179.550	1514419.194	8689.943	POND
1020	1776173.274	1514433.936	8689.904	POND
1021	1776166.417	1514452.654	8690.085	POND
1022	1776158.286	1514480.842	8690.011	POND
1023	1776151.573	1514507.001	8689.828	TOP
1024	1776144.270	1514535.911	8690.379	TOP
1025	1776138.773	1514565.049	8690.429	TOP
1026	1776133.679	1514595.627	8690.365	POND
1027	1776133.636	1514595.593	8690.314	POND
1028	1776131.623	1514623.102	8690.230	POND
1029	1776131.539	1514636.720	8690.187	POND
1030	1776134.613	1514644.368	8690.218	POND
1031	1776140.227	1514649.474	8689.926	POND
1032	1776155.987	1514654.669	8689.991	POND
1033	1776177.464	1514659.395	8690.415	POND
1034	1776193.765	1514659.424	8690.709	POND
1035	1776201.435	1514656.166	8690.371	POND

1036	1776205.011	1514651.930	8690.499	POND
1037	1776208.398	1514641.522	8690.217	POND
1050	1776180.079	1514625.728	8678.649	POND
1051	1776184.483	1514615.240	8679.021	POND
1052	1776187.697	1514600.904	8679.066	POND
1053	1776191.174	1514588.755	8679.193	POND
1054	1776194.369	1514574.821	8679.122	POND
1055	1776198.048	1514561.034	8679.107	POND
1056	1776201.550	1514546.286	8679.179	POND
1057	1776204.181	1514533.638	8679.065	POND
1058	1776207.150	1514521.563	8679.187	POND
1059	1776210.522	1514506.662	8679.157	POND
1060	1776213.847	1514493.334	8679.246	POND
1061	1776217.596	1514478.834	8679.303	POND
1062	1776221.362	1514465.731	8679.374	POND
1063	1776224.886	1514451.716	8679.593	POND
1064	1776228.220	1514439.527	8679.939	POND
1065	1776228.863	1514431.998	8680.120	POND
1066	1776225.062	1514427.694	8680.133	POND
1067	1776220.489	1514424.667	8680.203	POND
1068	1776213.284	1514423.011	8680.231	POND
1069	1776205.931	1514427.764	8680.165	POND
1070	1776202.637	1514434.869	8679.685	POND
1071	1776199.154	1514448.696	8679.315	POND
1072	1776193.963	1514466.030	8679.302	POND
1073	1776188.724	1514487.658	8679.194	POND
1074	1776183.753	1514507.565	8679.085	POND
1075	1776179.310	1514528.428	8678.881	POND
1076	1776173.436	1514552.975	8678.708	POND
1077	1776167.860	1514579.472	8678.635	POND
1078	1776163.094	1514603.097	8678.763	POND
1079	1776159.739	1514625.161	8678.600	POND
1080	1776160.811	1514628.021	8678.348	POND
1081	1776166.530	1514629.181	8677.992	POND
1082	1776174.292	1514630.811	8678.249	POND
1083	1776178.784	1514627.181	8678.553	POND
1084	1776181.602	1514622.037	8678.762	POND
1085	1776183.713	1514615.226	8678.884	POND
1100	1776172.082	1514628.705	8677.865	TRENCH
1101	1776176.307	1514612.060	8678.229	TRENCH
1102	1776180.767	1514595.324	8678.754	TRENCH
1103	1776186.770	1514570.355	8678.664	TRENCH
1104	1776192.623	1514545.750	8678.693	TRENCH
1105	1776198.206	1514522.413	8678.758	TRENCH
1106	1776203.738	1514499.404	8679.011	TRENCH
1107	1776209.468	1514476.950	8679.094	TRENCH
1108	1776214.287	1514455.662	8679.248	TRENCH
1109	1776221.398	1514425.746	8679.828	TRENCH
1110	1776219.274	1514425.144	8679.867	TRENCH
1111	1776213.049	1514451.133	8679.122	TRENCH
1112	1776206.668	1514477.631	8679.066	TRENCH
1113	1776200.537	1514502.901	8678.934	TRENCH
1114	1776194.003	1514529.283	8678.844	TRENCH
1115	1776187.284	1514556.333	8678.337	TRENCH
1116	1776182.639	1514577.615	8678.504	TRENCH
1117	1776177.749	1514597.137	8678.502	TRENCH
1118	1776172.672	1514617.098	8678.199	TRENCH
1119	1776169.921	1514628.045	8677.737	TRENCH
1120	1776172.056	1514628.687	8677.929	TRENCH
21404	1776193.687	1514526.021	8678.614	SAMPLE PT

21405	1776205.010	1514528.787	8678.948	SAMPLE PT
21406	1776180.799	1514523.394	8678.789	SAMPLE PT
21407	1776210.964	1514452.232	8679.002	SAMPLE PT
21408	1776173.280	1514608.726	8678.098	SAMPLE PT
100	1776142.544	1514601.570	8686.572	PIPE
101	1776142.222	1514602.282	8686.462	PIPE
102	1776142.236	1514601.752	8686.544	PIPE
103	1776147.949	1514601.216	8684.129	PIPE
104	1776158.522	1514669.139	8689.731	PIPE
105	1776158.402	1514669.038	8689.788	PIPE
106	1776159.717	1514669.657	8690.109	PIPE
107	1776205.148	1514632.803	8688.419	PIPE
108	1776205.149	1514632.850	8688.499	PIPE
109	1776205.386	1514631.689	8688.336	PIPE
110	1776199.683	1514630.484	8686.223	PIPE
111	1776235.770	1514519.019	8688.893	PIPE
112	1776235.780	1514519.000	8688.835	PIPE
113	1776235.998	1514517.884	8688.788	PIPE
114	1776231.499	1514517.596	8687.164	PIPE
115	1776228.345	1514396.224	8690.999	PIPE
116	1776228.346	1514396.211	8691.013	PIPE
117	1776227.715	1514396.190	8690.989	PIPE
120	1776188.298	1514415.040	8687.630	CULVERT
121	1776188.294	1514415.044	8687.661	CULVERT
122	1776188.031	1514416.850	8687.249	CULVERT
FH-1	1776175.300	1514452.100	?	
FH-2	1776241.000	1514411.600	?	
123	1776192.698	1514417.196	8685.574	CULVERT
150	1776410.397	1514462.114	8692.569	XMAS TREE
151	1776410.374	1514462.059	8692.628	XMAS TREE
160	1776314.767	1514513.477	8693.883	GOLD BIT
161	1776314.756	1514513.486	8693.887	GOLD BIT
162	1776314.744	1514513.497	8693.904	GOLD BIT
170	1776303.898	1514664.801	8694.613	XMAS TREE 2
171	1776304.003	1514664.769	8694.664	XMAS TREE 2
172	1776304.028	1514664.773	8694.605	XMAS TREE 2
200	1776281.011	1514413.175	8691.312	RAMPCUT
201	1776280.997	1514413.254	8691.346	RAMPCUT
202	1776262.873	1514419.200	8688.540	RAMPCUT
203	1776246.475	1514425.712	8684.998	RAMPCUT
204	1776232.004	1514434.057	8680.727	RAMPCUT
205	1776226.864	1514439.718	8679.655	RAMPCUT
206	1776221.734	1514427.440	8679.715	RAMPCUT
207	1776234.623	1514419.744	8683.233	RAMPCUT
208	1776248.436	1514412.862	8687.152	RAMPCUT
209	1776261.797	1514406.858	8689.395	RAMPCUT
210	1776273.427	1514401.313	8691.118	RAMPCUT
500	1776153.258	1514672.221	8689.649	SUMP
501	1776153.288	1514672.195	8689.651	SUMP
502	1776147.415	1514674.889	8689.883	SUMP
503	1776145.566	1514669.671	8690.107	SUMP
504	1776150.690	1514667.330	8689.901	SUMP

Back to top

Field surveyor:
Bill Kopp
Computer operator:
Bill Kopp
Reference:
Fenton Hill



Scale 1" to 37 ft
0 62.5 sft
US survey feet

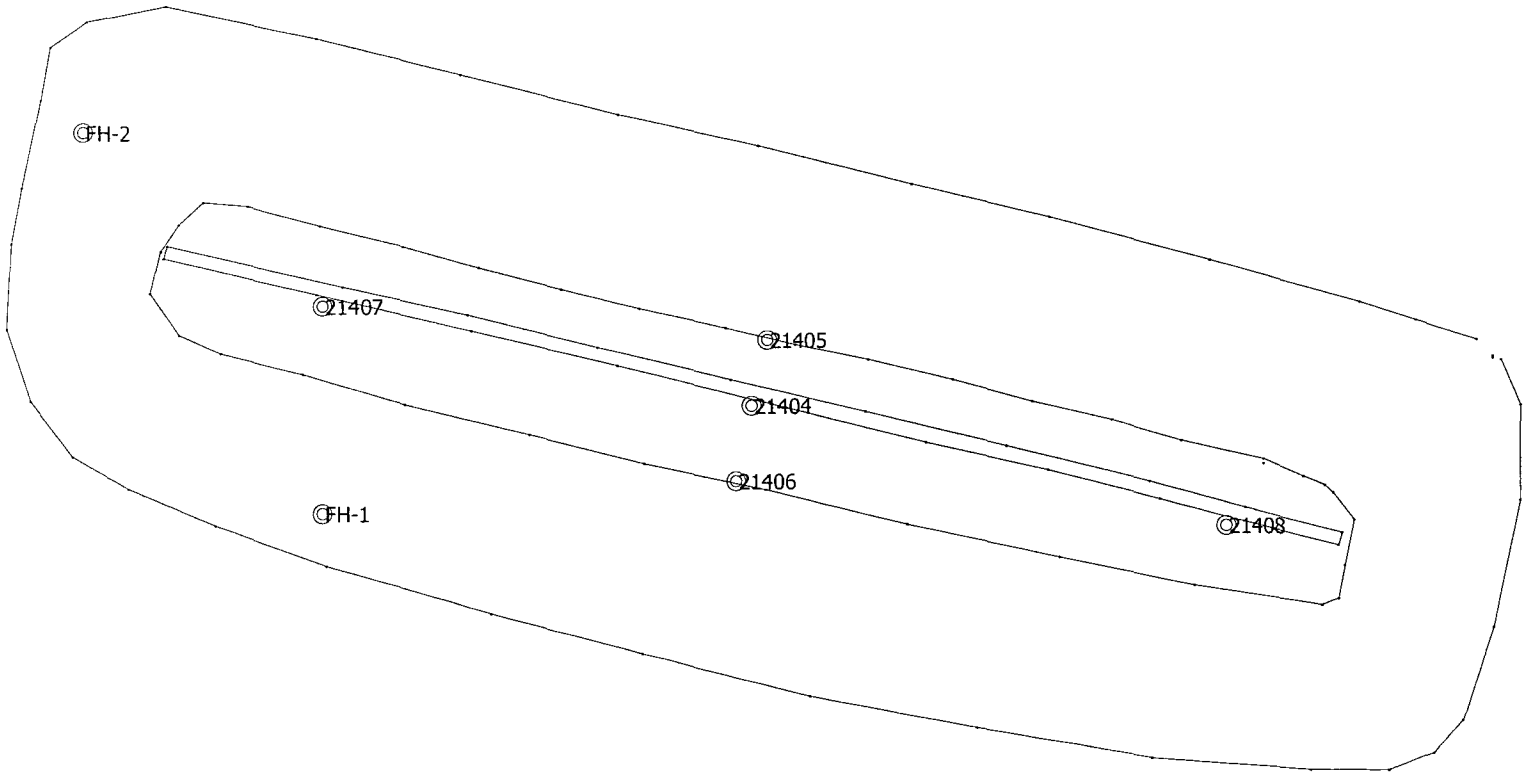
0°00'00"

Plot Scale: 1" to 37 ft
Printed on 1/6/2003, at 8:42:24 AM

Printed from Trimble Geomatics Office

Site: Not selected, System: Projection from data collector
Zone: Zone from data collector, Datum: (WGS 84)

Project: 1.0 MG Service Pond
USFeet Template



Field surveyor:
Bill Kopp
Computer operator:
Bill Kopp
Reference:
Fenton Hill

Scale 1" to 33 ft
0 50.0 sft
US survey feet

0°00'00"

Plot Scale: 1" to 33 ft
Printed on 1/15/2003, at 8:54:22 AM

Printed from Trimble Geomatics Office

Site: Not selected, System: Projection from data collector
Zone: Zone from data collector, Datum: (WGS 84)

Project: 1.0 MG Service Pond
USFeet Template

ATTACHMENT 11

LANL Letter RE:

Response to U.S. Forest Service's Request for Additional Information

Progress Report and Proposed Backfill Plan

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969/Fax: (505) 665-9344

Date: February 3, 2003
Refer to: RRES-WQH: 03-028

Mr. John F. Peterson
Jemez District Ranger
U.S. Forest Service
Jemez Ranger District
P.O. Box 150
Jemez Springs, NM 87025

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION, PROGRESS REPORT AND PROPOSED BACKFILL PLAN, 1-MG SERVICE POND, FENTON HILL GEOTHERMAL FACILITY

Dear Mr. Peterson:

On January 27, 2003, Ms. Carol Linn, Santa Fe National Forest, telephoned me to request additional information on the Progress Report and Proposed Backfill Plan submitted to you on January 16, 2003 (RRES-WQH: 03-008). Specifically, Ms. Linn requested the following:

1. Confirmation that the crusher fines located in the 1-MG service pond are not native to the Fenton Hill site;

2. Clarification of statements made by the Laboratory regarding the mobility of the arsenic in the crusher fines;

3. A drawing (cross-section) of the 1-MG service pond showing the proposed location of the buried crusher fines following backfill and final grading; and

4. The quantity of crusher fines in the 1-MG service pond.

Below are the Laboratory's responses to your agency's request:

1. The crusher fines currently lining the 1-MG service pond at Fenton Hill are not native to the site. All of the crusher fines were imported from a crusher pit located on Jemez Pueblo approximately ¼ mile northeast of the intersection of State Roads 4 and 290.

2. In the Progress Report and Proposed Backfill Plan referenced above, the Laboratory stated the following:

> *In conclusion, the data strongly indicates that the crusher fines imported from near Jemez Pueblo to construct the 1-MG service pond contained elevated concentrations of naturally occurring arsenic. Further, the data suggests that the arsenic in the crusher fines is tightly bound and not highly mobile. And finally, the data confirms that the arsenic in the crusher fines is not present at hazardous concentrations.*

The above statement regarding the mobility of arsenic in the crusher fines was based upon a comparison of total arsenic and TCLP arsenic analytical results. The Toxicity Characteristic Leaching Procedure (TCLP) is the most widely accepted leaching procedure for assessing the long-term impact of waste burial. The TCLP method (EPA Method 1311) was designed to determine the mobility of both organic and inorganic analytes present in a solid following extraction with an acetic acid buffer solution.

As presented in the Progress Report and Proposed Backfill Plan, the average TCLP arsenic concentration in three crusher fine samples is less than 0.1% of the total arsenic concentration (samples RC57-03-49714, -49718, -49720: avg. TCLP arsenic result=0.12 ppm; avg. total arsenic result=253 ppm). These results strongly suggest that the arsenic in the crusher fines is tightly bound and not highly mobile under the extraction conditions of the TCLP method (EPA Method 1311). The Laboratory has no information about the extraction conditions that the crusher fines would be exposed to if buried at the Fenton Hill site.

3. Attachment 1.0 is a cross-section of the 1-MG service pond at Fenton Hill showing the approximate location of the crusher fines following backfill and final grading. It is Laboratory's objective to position the crusher fines in the bottom of the 1-MG service pond in such a manner as to maximize the distance to the land surface. As indicated in the Progress Report and Backfill Plan, a minimum of 6 ft. of cover will be maintained over the buried crusher fines.

4. The Laboratory estimates that there are approximately 482 cubic yards of crusher fines in the 1-MG service pond. This estimate is based upon the following construction specifications obtained from the pond's original design documents (November 20, 1989):

   a. Total area of liner: 2,890 square yards
   b. Depth of crusher fines: 0.5 ft.

Please contact me at (505) 667-7969 should you have any questions regarding this response to your agency's request for additional information.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

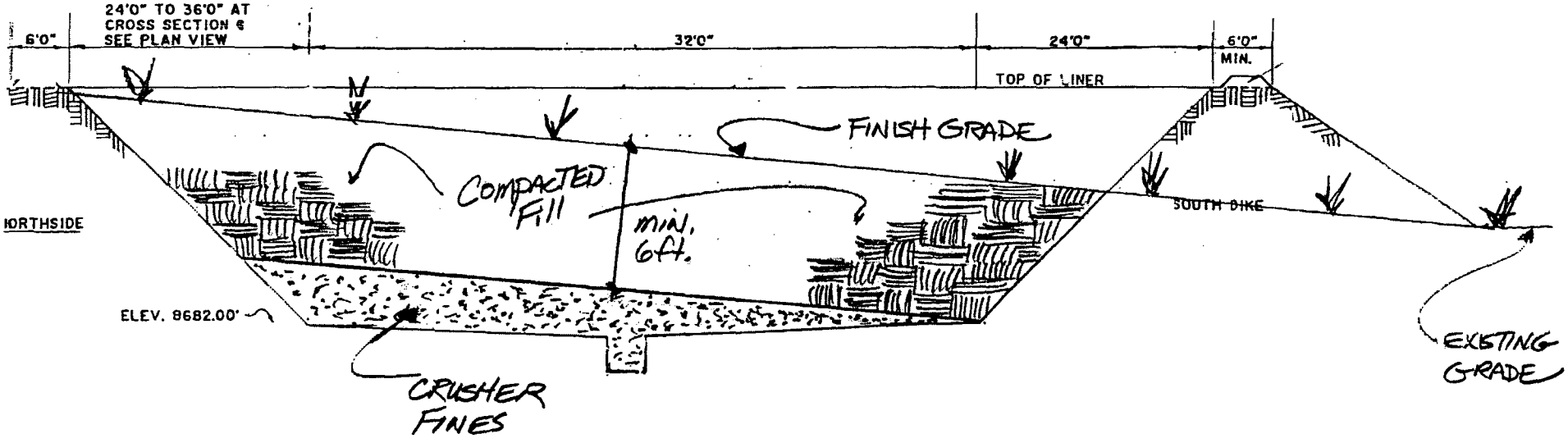
BB/tml

Attachments: a/s

Cy: A. Ferrell, Forest Service, Jemez Ranger District, Jemez Springs, NM, w/att.
C. Linn, Forest Service, Santa Fe National Forest, Santa Fe, NM, w/att.
M. Miolano, Forest Service, New Mexico National Forests, Albuquerque, NM, w/att.
J. Vozella, DOE/OLASO, w/att., MS A316
G. Turner, DOE/OLASO, w/att., MS A316
J. Holt, ADO, w/att., MS A104
C. Webster, ADSR, w/att., MS A127
P. Weber, EES-DO, w/att., MS D446
J. Hansen, EES-DO, w/att., MS D446
J. Thomson, EES-11, w/att., MS D443
S. Archuleta, P-FM, w/att., MS D410
B. Ramsey, RRES-DO w/att., MS J591
K. Hargis, RRES-DO, w/att., MS J591
D. Stavert, RRES-EP, w/att., MS J591
S. Rae, RRES-WQH, w/att., MS K497
D. Rogers, RRES-WQH, w/att., MS K497
D. McInroy, RRES-R, w/att., MS M992
T. Rust, RRES-R, w/att., MS M992
T. Grieggs, RRES-SWRC, w/att., MS K490
B. Kopp, RRES-SWRC, w/att., MS M992
E. Louderbough, LC-ESH, w/att., MS A187
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

ATTACHMENT 1.0 FENTON HILL 1-MG SERVICE POND

PROPOSED BACKFILL PLAN



CROSS SECTION B-B

NTS

- CRUSHER FINES VOLUME ≅ 482 yd^3
- CRUSHER FINES PILE ≅ 223' x 24' x 2.5'(AVG)

1/29/03

RBS-WQH

ATTACHMENT 12

U.S. Forest Service Approval Letter RE:

1-MG Service Pond
Proposed Backfill Plan

United States Department of Agriculture | Forest Service | Santa Fe National Forest (505) 438-7840 | 1474 Rodeo Road P.O. Box 1689 Santa Fe, NM 87505

File Code: 2160/1580 **Date:** February 3, 2003
Route To: Interagency Agreement # DE-A132-98AL78589
Subject: Proposed Backfill Plan – 1 MG Service Pond: Fenton Geothermal Facility (RRES-WQH: 03-008)
To: Los Alamos National Laboratory
Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
P.O. 1663, MSK497
Los Alamos, NM 87545

Dear Mr. Beers,

Thank you for your correspondence of January 16, 2003 and the additional information supplied in correspondence of January 30, 2003. The request to backfill the 1 MG service pond is approved.

Positive drainage shall be maintained and the soils shall be compacted up to one foot from the finished grade. Please include the location of the obliterated pond on your Fenton Hill (TA-57) Facility Site Plan.

We appreciate the supporting analysis and documentation for the demolition and closure of the 1 MG service pond and the information provided on the drinking water well.

Sincerely,

JOHN F. PETERSON
Jemez District Ranger
Santa Fe National Forest
USDA Forest Service

cc: Anne Ferrell, Michael Frazier, Pat Leyba, Reuben Montes, Carol J. Linn, Sarah H. Baker, Marcia Miolano, Ben Martinez

File: Interagency Agreement, Fenton Hill

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969 / Fax: (505) 665-9344

Date: January 24, 2003
Refer to: RRES-WQH: 03-020

Mr. Wayne Price
Petroleum Engineering Specialist
Oil Conservation Division
New Mexico Energy, Minerals, and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

SUBJECT: GROUND WATER DISCHARGE PLAN (GW-031) ANNUAL REPORT, FENTON HILL HOT DRY ROCK GEOTHERMAL FACILITY, 2002

Dear Mr. Price:

This letter is being submitted as Los Alamos National Laboratory's Ground Water Discharge Plan (GW-031) Annual Report for the Fenton Hill Hot Dry Rock Geothermal Facility for 2002.

The following is a summary of the relevant information for 2002:

1. No water was injected into EE-2A in 2002.

2. EE-2A was plugged and abandoned on September 13, 2002. As required by NM OCD Rule 202, Form C-103, *Sundry Notices and Reports on Wells*, was submitted to your agency on October 2, 2002, (RRES-WQH: 02-362).

3. On August 14, 2002, the Laboratory submitted a Closure Plan for removal of the 1-MG service pond and aboveground portions of geothermal well EE-2A. On August 15, 2002, your agency approved the Laboratory's Closure Plan.

4. Closure of the 1-MG service pond began on October 23, 2002. Removal and disposal of the pond's geothermal fluids, sludge, and liners was successfully completed in November 2002. Backfilling, final grading, and revegetation will be completed in accordance with the Closure Plan and in coordination with your agency and the U.S. Forest Service. A progress report on the work completed to-date will be submitted to your agency within the next 30 days.

5. No wastewater was land applied or discharged to the environment during 2002.

Please call me at (505) 667-7969 if you have any questions concerning this report.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

BB/yg

Cy: M. Khatibi, Pueblo of Jemez, Jemez Springs, New Mexico
J. Peterson, District Ranger, Jemez Ranger District, Jemez Springs, New Mexico
J. Parker, NMED-DOE/OB, Santa Fe, New Mexico
J. Garcia, CER-30, MS A117
J. Vozella, DOE/OLASO, MS A316
G. Turner, DOE/OLASO, MS A316
J. Holt, ADO MS A104
P. Weber, EES-DO, MS D446
M. Fehler, EES-11, MS D443
J. Thomson, EES-11, MS D443
B. Ramsey, RRES-DO, MS J591
K. Hargis, RRES-DO, MS J591
D. Stavert, RRES-EP, MS J591
S. Rae, RRES-WQH, MS K497
D. Rogers, RRES-WQH, MS K497
P. Wardwell, LC-ESH, MS A187
RRES-WQH File, MS K497
IM-5, MS A150

Price, Wayne

From: Price, Wayne
Sent: Friday, February 14, 2003 10:08 AM
To: 'bbeers@lanl.gov'
Subject: 1-MG Service Pond

Contacts: Bob Beers

Original in mail! Good Luck.

1-MG Service Pond.DOC

Sincerely:

Wayne Price
New Mexico Oil Conservation Division
1220 S. Saint Francis Drive
Santa Fe, NM 87505
505-476-3487
fax: 505-476-3462
E-mail: WPRICE@state.nm.us

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

February 14, 2003

CERTIFIED MAIL
RETURN RECEIPT 3929 9765

Mr. Bob Beers
Los Alamos National Laboratory
P.O. Box 1663, MS K497
Los Alamos, New Mexico 87545

Re: Discharge Plan GW-031 1-MG Service Pond Closure Plan
Fenton Hill Geothermal Facility
Sandoval County, New Mexico

Dear Mr. Beers:

The New Mexico Oil Conservation Division (OCD) is in receipt of your "Progress Report and Proposed Backfill Plan, 1-MG Service Pond at the Fenton Hill Geothermal Facility" dated February 07, 2003. The NMOCD hereby approves of your closure plan and request that a final report be submitted for our files.

Please be advised that NMOCD approval of this closure plan does not relieve Los Alamos National Laboratory of responsibility should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve Los Alamos National Laboratory of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Sincerely;

Wayne Price

Wayne Price-Pet. Engr. Spec.

cc: OCD Aztec Office

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969/Fax: (505) 665-9344

Date: November 14, 2002
Refer to: RRES-WQH: 02-425

Mr. Harlan Brown
Envirotech, Inc.
5796 US Highway 64
Farmington, New Mexico 87401

SUBJECT: CERTIFICATE OF WASTE STATUS, FENTON HILL HOT DRY ROCK GEOTHERMAL FACILITY

Dear Mr. Brown:

Per your request, enclosed is a completed and signed New Mexico Oil Conservation Division *Certificate of Waste Status* form for wastes from the 1-MG service pond at the Fenton Hill Hot Dry Rock Geothermal Facility.

Please contact me at (505) 667-7969 if you have any questions regarding this form.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

BB/tml

Enclosures: a/s

Cy: W. Price, NM/OCD, Santa Fe, NM, w/enc.
M. Kieling, NM OCD, Santa Fe, NM, w/enc.
J. Peterson, Santa Fe National Forest, Jemez Ranger District, Jemez Springs, NM, w/enc.
C. Linn, Santa Fe National Forest, Santa Fe, NM, w/enc.
J. Vozella, DOE/OLASO, w/enc., MS A316

Cy (continued):
G. Turner, DOE/OLASO, w/enc., MS A316
P. Weber, EES-DO, w/enc., MS D446
J. Hansen, EES-DO, w/enc., MS D446
J. Thomson, EES-11, w/enc., MS D443
B. Ramsey, RRES-DO, w/enc., MS J591
K. Hargis, RRES-DO, w/enc., MS J591
D. Stavert, RRES-EP, w/enc., MS J591
A. Dye, RRES-SWRC, w/enc., MS K490
S. Rae, RRES-WQH, w/enc., MS K497
D. Rogers, RRES-WQH, w/enc., MS K497
P. Wardwell, LC-ESH, w/enc., MS A187
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE
1000 RIO BRAZOS ROAD
AZTEC, NEW MEXICO 87410
(505) 334-6178 Fax (505)334-617

GARY E. JOHNSON
GOVERNOR

JENNIFER A. SALISBURY
CABINET SECRETARY

CERTIFICATE OF WASTE STATUS

1. Generator Name and Address:	2. Destination Name:
Los Alamos National Laboratory P.O. Box 1663 Los Alamos, NM 87545	Envirotech Soil Remediation Facility Landfarm #2 Hilltop, New Mexico
3. Originating Site (name): Fenton Hill Hot Dry Rock Geothermal Facility Attach list of originating sites as appropriate	**Location of the Waste (Street address &/or ULSTR):** Sandoval County, NM
4. Source and Description of Waste The Hot Dry Rock Geothermal Project utilized a 1-MG Service pond to store geothermal fluids. In 1997 the pond was drained and cleaned. Since 1997 the pond has been used to store vented geothermal fluid from geothermal well EE-2A and ion exchange back flush water from the Milagro project. The addition of non-geothermal water from the Milagro project was conducted with OCD's permission and in accordance with NMOCD's mixture policy.	

I, Paul Weber representative for:
(Print Name)
Los Alamos National Laboratory do hereby certify that, according to the Resource Conservation and Recovery Act (RCRA) and Environmental Protection Agency's July, 1988, regulatory determination, the above described waste is: (Check appropriate classification)

XX **EXEMPT** oilfield waste

___ **NON-EXEMPT** oilfield waste which is non-hazardous by characteristic analysis or by product identification

and that nothing has been added to the exempt or non-exempt non-hazardous waste defined above.

For **NON-EXEMPT** waste the following documentation is attached (check appropriate items):

___ MSDS Information
___ RCRA Hazardous Waste Analysis
___ Chain of Custody
___ Other (description):

This waste is in compliance with Regulated Levels of Naturally Occurring Radioactive Material (NORM) pursuant to 20 NMAC 3.1 subpart 1403.C and D.

Name (Original Signature): Paul Weber

Title: EES Division Director

Date: 14 Nov' 02

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969/Fax: (505) 665-9344

Date: August 14, 2002
Refer to: RRES-WQH: 02-316

Mr. John F. Peterson
District Ranger
Jemez Ranger District
Santa Fe National Forest
P.O. Box 150
Jemez Springs, New Mexico 87025

SUBJECT: CLOSURE PLAN, FENTON HILL GEOTHERMAL FACILITY, LOS ALAMOS NATIONAL LABORATORY

Dear Mr. Peterson:

Enclosed, please find Los Alamos National Laboratory's Closure Plan for the 1-million gallon (MG) service pond and EE-2A wellhead at the Fenton Hill Geothermal Facility. This Closure Plan is being submitted to your agency for review. The Closure Plan has also been submitted to the New Mexico Oil Conservation Division (NM OCD) for their review and approval; the NM OCD regulates the Fenton Hill Geothermal Facility under Discharge Plan GW-031.

As you may recall, in 1996, under the direction of the U.S. Department of Energy, the Laboratory began decommissioning the Fenton Hill Geothermal Facility; all geothermal wells were plugged and abandonment with the exception of the EE-2A production well. The two principal decommissioning activities currently remaining at the facility are (1) the plugging and abandonment of well EE-2A, and (2) closure of the 1-MG service pond. This plan covers the closure of the 1-MG service pond and the removal of the aboveground portions of well EE-2A (concrete pad, surface casing). The plugging and abandonment of well EE-2A was covered under a separate set of procedures that I provided you in my July 10, 2002, letter (RRES-WQH: 02-253). The NM OCD approved the Laboratory's plugging and abandonment procedures for well EE-2A on July 19, 2002.

On June 24, 2002, the Laboratory submitted an application to the NM OCD, with copy to you, to inject geothermal fluids from the 1-MG service pond into well EE-2A for permanent disposal. The NM OCD approved the Laboratory's application on July 10, 2002. However, after further consideration, the Laboratory has decided not to inject any geothermal fluids into well EE-2A. As presented in the Closure Plan, the Laboratory is considering two other disposal options for the geothermal fluids: (1) on-site treatment (evaporation) of the fluids with off-site disposal of the solids, or (2) off-site treatment and disposal. A final path forward for the treatment and disposal of the geothermal fluids will be selected in coordination with NM OCD.

Please contact me at (505) 667-7969 should you have any questions or comments regarding the enclosed Closure Plan.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

BB/am

Enclosures: a/s

Cy: W. Price, NM OCD, Santa Fe, New Mexico, w/o enc.
A. Ferrell, Forest Service, Jemez Ranger District, Jemez Springs, New Mexico, w/enc.
C. Linn, Forest Service, Santa Fe National Forest, Santa Fe, New Mexico, w/enc.
M. Khatibi, Pueblo of Jemez, Jemez Pueblo, New Mexico, w/o enc.
J. Garcia, CER-30, w/o enc., MS A117
J. Vozella, DOE/OLASO, w/o enc., MS A316
G. Turner, DOE/OLASO, w/o enc., MS A316
J. Holt, ADO, w/o enc., MS A104
P. Weber, EES-DO, w/o enc., MS D446
J. Hansen, EES-DO, w/o enc., MS D446
J. Thomson, EES-11, w/o enc., MS D443
S. Archuleta, P-FM, w/o enc., MS D459
B. Ramsey, RRES-DO, w/o enc., MS J591
K. Hargis, RRES-DO, w/o enc., MS J591
D. Stavert, RRES-EP, w/o enc., MS J978
S. Rae, RRES-WQH, w/o enc., MS K497
D. Rogers, RRES-WQH, w/o enc., MS K497
D. McInroy, RRES-R, w/o enc., MS M992
T. Rust, RRES-R, w/o enc., MS M992
P. Wardwell, LC, w/o enc., MS A187
RRES-WQH File, w/o enc., MS K497
IM-5, w/enc., MS A150

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969/Fax: (505) 665-9344

Date: October 2, 2002
Refer to: RRES-WQH: 02-362

Mr. Roy E. Johnson
Senior Petroleum Geologist
District IV Supervisor
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

SUBJECT: SUNDRY NOTICE FOR THE PLUGGING AND ABANDONMENT OF FENTON HILL GEOTHERMAL WELL EE-2A

Dear Mr. Johnson:

As required under New Mexico Oil Conservation Division Rule 202, Form C-103, *Sundry Notices and Reports on Wells*, must be filed within 30 days of completion of geothermal well plugging and abandonment. To fulfill your Division's requirement, enclosed are three (3) copies of Form C-103 for the recently completed plugging and abandonment of Fenton Hill geothermal well EE-2A. Included with the Sundry Notice for EE-2A are the following supporting documents: (1) Cement Job Report, (2) Cementing Laboratory Report, (3) Cement Plug No.1 Tagging Graph, and (4) Casing Schematic of EE-2A prior to abandonment.

Plugging and abandonment operations at EE-2A were conducted by BJ Services, Inc., Farmington, New Mexico, on September 10-13, 2002. A bottom cement plug was installed from 10,870 ft. to 9,300 ft. and subsequently tagged at 9,650 ft. Corrosion inhibitor and four additional deep cement plugs were installed at the specified depth intervals. A sixth and final plug was installed from 89 ft. to the surface. The only tasks remaining to complete abandonment of EE-2A are removal of the wellhead and the installation of a nameplate; this work is scheduled for October-November 2002.

Please contact me at (505) 667-7969 should you have any questions regarding this information.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

BB/am

Enclosures: a/s

Cy: W. Price, NM OCD, Santa Fe, New Mexico, w/enc.
J. Peterson, Santa Fe National Forest, Jemez Ranger District, Jemez Springs, NM, w/enc.
C. Linn, Santa Fe National Forest, Santa Fe, New Mexico, w/enc.
L. Gordon, NM OSE, Santa Fe, New Mexico, w/enc.
F. Oneyear, BLM, Santa Fe, New Mexico, w/enc.
J. Vozella, DOE/OLASO, w/enc., MS A316
G. Turner, DOE/OLASO, w/enc., MS A316
J. Holt, ADO, w/enc., MS A104
P. Weber, EES-DO, w/enc., MS D446
J. Hansen, EES-DO, w/enc., MS D446
M. Fehler, EES-11, w/enc., MS D443
J. Thomson, EES-11, w/enc., MS D443
S. Archuleta, P-FM, w/enc., MS D459
B. Ramsey, RRES-DO, w/enc., MS J591
K. Hargis, RRES-DO, w/enc., MS J591
D. Stavert, RRES-EP, w/enc., MS J978
S. Rae, RRES-WQH, w/enc., MS K497
D. Rogers, RRES-WQH, w/enc., MS K497
D. McInroy, RRES-R, w/enc., MS M992
T. Rust, RRES-R, w/enc., MS M992
P. Wardwell, LC-ESH, w/enc., MS A187
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised March 25, 1999

WELL API NO.
EE-2A (non-API)

5. Indicate Type of Lease
STATE ☐ FEE ☐

6. State Oil & Gas Lease No.
N/A

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

1. Type of Well:
Oil Well ☐ Gas Well ☐ Other – Experimental geothermal production well

7. Lease Name or Unit Agreement Name:
Fenton Hill Hot Dry Rock Geothermal Project

2. Name of Operator
Los Alamos National Laboratory

8. Well No. – EE-2A

3. Address of Operator
P.O.Box 1663, Los Alamos, NM 87545

9. Pool name or Wildcat
N/A

10. Well Location

Unit Letter_____: well is located 1609 feet from the East line and 1405 feet from the North line

Section 13 Township 19N Range 2E NMPM Sandoval County

10. Elevation (*Show whether DR, RKB, RT, GR, etc.*)
KB

11. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	PLUG AND ABANDONMENT	IXI
PULL OR ALTER CASING	☐	MULTIPLE COMPLETION	☐	CASING TEST AND CEMENT JOB	☐		
OTHER:	☐			OTHER:			☐

12. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompilation.

Set 16.5 ppg Class H cement plug at 10,870' to 9,300' and allowed it to set overnight. Tagged cement top at 9,650'. Set 2nd cement plug at 9,650' - 9,400'. Filled hole with corrosion inhibitor treated fresh water to 6,550' and set 3rd cement plug from 6,550' to 6,450'. Filled hole with corrosion inhibitor treated fresh water to 3,550' and set 4th cement plug from 3,550' to 3,450'. Filled hole with corrosion inhibitor treated fresh water to 2,693' and set 5th cement plug from 2,693' to 2,493'. Filled hole with corrosion inhibitor treated water and set 6th cement plug from 89' to surface.

Please find BJ Services treatment report, cement lab report and well diagrams attached. Work was performed 9/10 - 9/13/02.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Paul J Weber TITLE Division Leader DATE 10/8/02

Type or print name Paul Weber Telephone No. 505-667-3644

(This space for State use)

APPPROVED BY _____ TITLE _____ DATE _____

Conditions of approval, if any:

CEMENT JOB REPORT

CUSTOMER Los Alamos National Laborator	**DATE** 10-SEP-02	**F.R. #** 216425049	**SERV. SUPV.** Richard H Kovacs
LEASE & WELL NAME Fenton Hill Well EE #2a	**LOCATION** Sec13 , T19N , R2E		**COUNTY-PARISH-BLOCK** Sandoval New Mexico
DISTRICT Farmington	**DRILLING CONTRACTOR RIG #**		**TYPE OF JOB** Plug & Abandon

SIZE & TYPE OF PLUGS	LIST-CSG-HARDWARE	PHYSICAL SLURRY PROPERTIES						
	NA-P&A	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT^3	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
MATERIALS FURNISHED BY BJ								
Fresh Water			8.34				60	
Class H Cement		260	16.5	1.45	5.17	08:15	66.93	31.99
Fresh Water			8.34			23:00	60	
Class H Cement		25	16.5	1.45	5.17	06:00	6.44	3.08
Fresh Water			8.34			29400	50	
Class H Cement		25	16.5	1.06	4.17	21600	4.70	2.48
Fresh Water			8.34				38	
Available Mix Water 800 **Bbl.** **Available Displ. Fluid** 800 **Bbl.**					**TOTAL**		286.07	37.55

HOLE			TBG-CSG-D.P.					COLLAR DEPTHS		
SIZE	% EXCESS	DEPTH	SIZE	WGT.	TYPE	DEPTH	GRADE	SHOE	FLOAT	STAGE
8.5		12360	7	32	CSG	10770				

LAST CASING				PKR-CMT RET-BR PL-LINER		PERF. DEPTH		TOP CONN		WELL FLUID	
SIZE	WGT	TYPE	DEPTH	BRAND & TYPE	DEPTH	TOP	BTM	SIZE	THREAD	TYPE	WGT.
								1.75	EVE	FRESH WATER	8.34

DISPL. VOLUME		DISPL. FLUID		CAL. PSI	CAL. MAX PSI	OP. MAX	MAX TBG PSI		MAX CSG PSI		MIX WATER
VOLUME	UOM	TYPE	WGT.	BUMP PLUG	TO REV.	SQ. PSI	RATED	Operator	RATED	Operator	
35	BBLS	Fresh Water	8.34	0	0	0	5000	5000	0	0	Frac Tank
		Fresh Water	8.4								

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING:

PRESSURE/RATE DETAIL					EXPLANATION
TIME HR:MIN.	PRESSURE - PSI PIPE	PRESSURE - PSI ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	
						SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 6000 PSI
						CIRCULATING WELL - RIG [ ] BJ [X]
						9/10/02
16:20						ST RIG UP
18:00	2000				N2	ST N2 PUMP FOR PRESSURE TEST 2000 PSI
18:38	0				0	SHUT DOWN
						9/11/02 1ST PLUG 10,870' TO 9,400'
08:04	6000		1		H20	ST PRESSURE TEST 6000 PSI
08:20	480		1.5	.9	H20	ST FILL TUBING 35 BBLS
08:59	0		0	35	H20	SHUT DOWN
09:00	5000		1	0	H20	ST PRESSURE TEST ONTHE TUBING 5000PSI
09:25	2000		.6	.5	H20	ST TO CIRCULATE TUBING DOWN
12:02	4760		1.9	65	H20	PUMP WITH ACID FRAC 102 BBLS
12:50	0		0	102	0	SHUT DOWN
12:54	2300		1	0	CMT	ST 67.1BBLS CEMENT @ 16.5 ppg
01:30	1438		1.2	38	CMT	ST TUBING OUT OF THE HOLE
02:21	2600		1.2	23	H20	ST DISPLACEMENT 35 BBLS
02:51	1670		1.2	35	H20	ST TO CIRCULATE TUBING OUT OF THE HOLE
03:09	0		0	50	0	SHUT DOWN
						ST 2ND PLUG 9-12-02 9,650' TO 9,400'
07:27	70		1	0	H20	ST FILL TUBING 18 BBLS
07:50	1330		1	18	H20	ST LOAD HOLE 7 BBLS
07:57	0		0	7	0	SHUT DOWN
08:00	257		4	0	H20	ST PRESSURE TEST CASING TO 250 PSI

SUPPLEMENTAL CEMENT JOB REPORT

Field Receipt # 216425049

CUSTOMER	DATE	F.R. #	SERV. SUPV.
Los Alamos National Laboratory	10-SEP-02	216425049	Richard H Kovacs
LEASE & WELL NAME - OCSG	**LOCATION**		**COUNTY-PARISH-BLOCK**
Fenton Hill Well EE #2a	Farmington		Sandoval New Mexico
DISTRICT	**DRILLING CONTRACTOR RIG #**		**TYPE OF JOB**
Farmington			Plug & Abandon

PRESSURE/RATE DETAIL

TIME HR:MIN	PRESSURE - PSI PIPE	PRESSURE - PSI ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
08:21	1370		1	.6	H20	ST TUBING TO TAG PLUG, TAG CEMENT @ 9,650 FT.
11:04	1370		1	18	CMT	ST 7.1 BBLS CEMENT PLUG @ 16.5 ppg
11:10	1910		1	7.1	H20	ST 102 BBLS DISPLACEMENT WITH C/I
12:41	0		0	102	0	SHUT DOWN
						3RD PLUG 6,550' TO 6,450'
12:53	1350		1	0	CMT	ST 6.45 BBLS CEMENT @ 16.5 ppg
12:57	4000		1.5	6.45	H20 C/I	ST 104.6 BBLS DISPLACEMENT WITH C/ I
13:46	0		0	104	0	SHUT DOWN
						4TH PLUG 3,550' TO 3,450'
13:46	1080		1	0	CMT	ST 7 BBLS CEMENT @ 16.5 ppg
13:50	3650		1.5	7	H20 C/I	ST 27.3BBLS DISPLACEMENT C/I
14:11	2830		1.5	27.3	H20	ST 35 BBLS H20 DISPLACEMENT
14:19	0		0	35	0	SHUT DOWN
						5TH PLUG 2,693' TO 2,493'
14:23	3195		1.5	0	CMT	ST 12.8 BBLS CEMENT @16.5 ppg
14:28	4123		1.5	12.8	H20 C/I	ST 87.2 BBLS DISPLACEMENT C/I
15:37	0		0	87.2	0	SHUT DOWN
15:47	2000		0	0	N2	ST N2 CLEAR OUT OF COILTUBING UNIT
						6TH PLUG 75' TO 0' 9-13-02
08:36	65		.2	0	CMT	ST 6.2BBLS CEMENT @ 16.5
09:04	0		0	6	0	SHUT DOWN ST CLEAN UP OF B.O.P.

BUMPED PLUG	PSI TO BUMP PLUG	TEST FLOAT EQUIP.	BBL.CMT RETURNS/ REVERSED	TOTAL BBL PUMPED	PSI LEFT ON CSG	SPOT TOP OUT CEMENT	SERV. SUPV.
Y [N]		Y [N]	2	764	0	Y [N]	Richard Kovacs

CEMENTING LABORATORY REPORT
TOMBALL LAB # 02-07-0556

COMPANY :	Los Alamos National Lab	DATE:	8/20/02
WELL NAME:	HDR EE2A	LOCATION:	Sec 13/T19N/R2E,Sandoval Co.
DISTRICT:	Farmington, NM	TYPE JOB:	Coil Tubing Plug
DEPTH MD(ft):	10800	MUD WT(ppg):	
TVD(ft):	10800	BHST(°F):	430
CASING SIZE("):	1.75 CT	BHCT(°F):	
HOLE SIZE("):		BHSqT(°F):	430
TOC(md):		TOL (°F):	Static / Circ.

SLURRY DATA

#1	Southdown H + 40% Silica Flour + 1.3% R-8 + 1.3% Boric Acid (Granular) + .75% FLR-1 + .2% CD-32
#2	Southdown H + 40% Silica Flour + 1.5% R-8 + 1.5% Boric Acid (Granular) + .75% FLR-1 + .2% CD-32
#3	Southdown H + 40% Silica Flour + 1.5% R-8 + 1.5% Boric Acid (Granular) + .75% FLR-1 + .2% CD-32 (Field Blend)

SLURRY PROPERTIES			#1		#2		#3	
Density : ppg			16.5		16.5		16.5	
Yield :cu.ft./sk.			1.446		1.448		1.448	
Mixing Water: gal/sk.			5.219		5.2		5.2	
Water Type:			Tap		Tap		Location	
Testing Temperature :			430 °F	°F	430 °F	°F	430 °F	°F
Thickening Time: hrs.			8:45		11:15		8:10	
Fluid Loss:ml/30min					80		50	
Compressive Strength : psi			°F	°F	°F	°F	°F	°F
	50psi	hrs.						
	500psi	hrs.						
		hrs.						
		hrs.						
		hrs.						
Rheologies		RPM	°F	°F	rt °F	°F	rt °F	200 °F
		300			432		328	128
		200			306		216	82
		100			166		112	40
		6			12		6	2
		3			8		4	2
		600			600+		550	270
		PV	0	0	#VALUE!	0	222	142
		YP	0	0	#VALUE!	0	106	-14
Gel Strength : #/100sq.ft.		10 sec.						
		10 min.						
Free Water : mls	@45°	@90°						

REMARKS :

CEMENTING LABORATORY REPORT
TOMBALL LAB # 02-07-0556

COMPANY :	Los Alamos National Lab	DATE:	8/20/02
WELL NAME:	HDR EE2A	LOCATION:	Sec 13/T19N/R2E,Sandoval Co.
DISTRICT:	Farmington, NM	TYPE JOB:	Coil Tubing Plug
DEPTH MD(ft):	10800	MUD WT(ppg):	
TVD(ft):	10800	BHST(°F):	430
CASING SIZE("):	1.75 CT	BHCT(°F):	
HOLE SIZE("):		BHSqT(°F):	430
TOC(md):		TOL (°F):	Static / Circ.

SLURRY DATA

#1	Southdown H + 40% Silica Flour + 1.3% R-8 + 1.3% Boric Acid (Granular) + .75% FLR-1 + .2% CD-32
#2	Southdown H + 40% Silica Flour + 1.5% R-8 + 1.5% Boric Acid (Granular) + .75% FLR-1 + .2% CD-32
#3	

SLURRY PROPERTIES			#1		#2		#3	
Density : ppg			16.5		16.5			
Yield :cu.ft./sk.			1.446		1.448			
Mixing Water: gal/sk.			5.219		5.2			
Water Type:			Tap		Tap			
Testing Temperature :			430 °F	°F	430 °F	°F	°F	°F
Thickening Time: hrs.			8:45		11:15			
Fluid Loss:ml/30min								
Compressive Strength : psi			°F	°F	°F	°F	°F	°F
	50psi	hrs.						
	500psi	hrs.						
		hrs.						
		hrs.						
		hrs.						
Rheologies		RPM	°F	°F	°F	°F	°F	°F
		300						
		200						
		100						
		6						
		3						
		600						
		PV	0	0	0	0	0	0
		YP	0	0	0	0	0	0
Gel Strength : #/100sq.ft.		10 sec.						
		10 min.						
Free Water : mls	@45°	@90°						

REMARKS :

BJ Services Farmington Laboratory Report

Report #: 131900612FB

Customer/Well Information

Company:	Los Alamos Nat'l Laboratory	Depth MD:	3,450 ft	Date:	August 22, 2002
Well Name:	Fenton Hill #EE-2A	Depth TVD:	3,450 ft	Prepared for:	Customer
API #		TOC(md):		Submitted by:	Cliff Anderson
Location:	Sandoval Co, NM	Casing Size:		Prepared by:	Dave Shepherd
District:	Farmington	Tubing Size:		Water Type:	Tap
Type Job:	3 rd Plug Slurry	Hole size:			

BHST: 215 °F BHCT: 156 °F BHSqT: 178 °F

Slurry Design Data

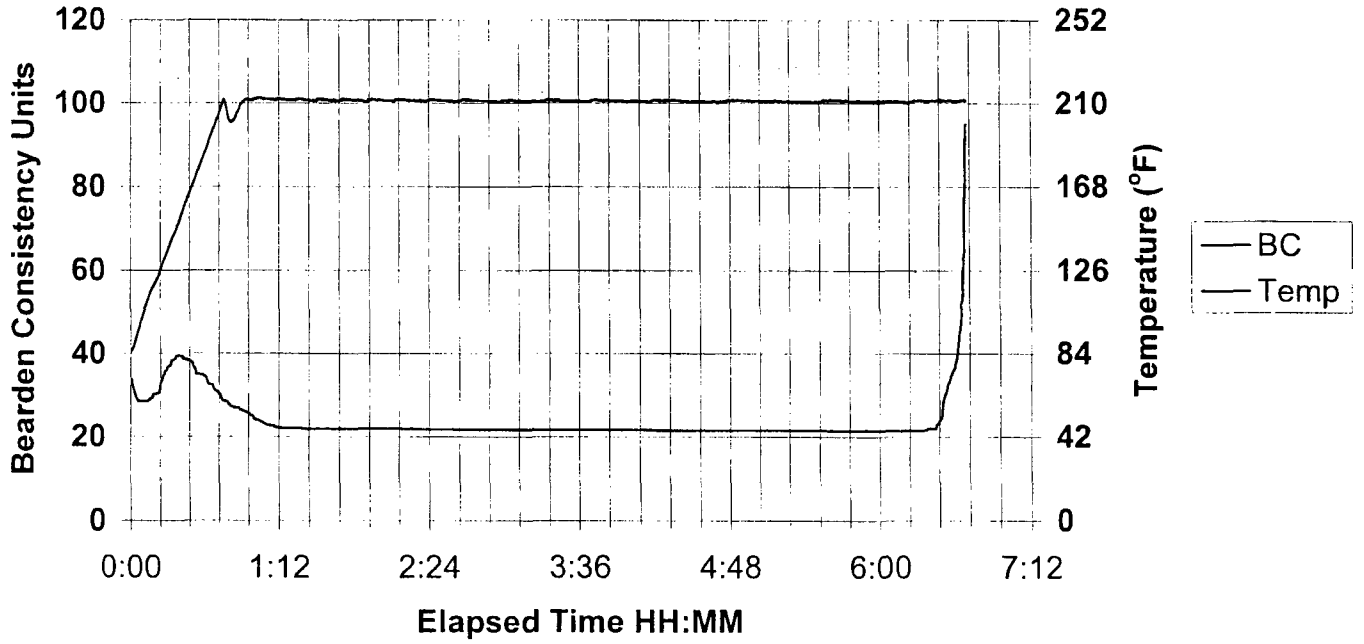
Class H + .5% FL-25 + 1.0% R-3 + .2% CD-32 (Field Blend 3rd retest)

Slurry Properties

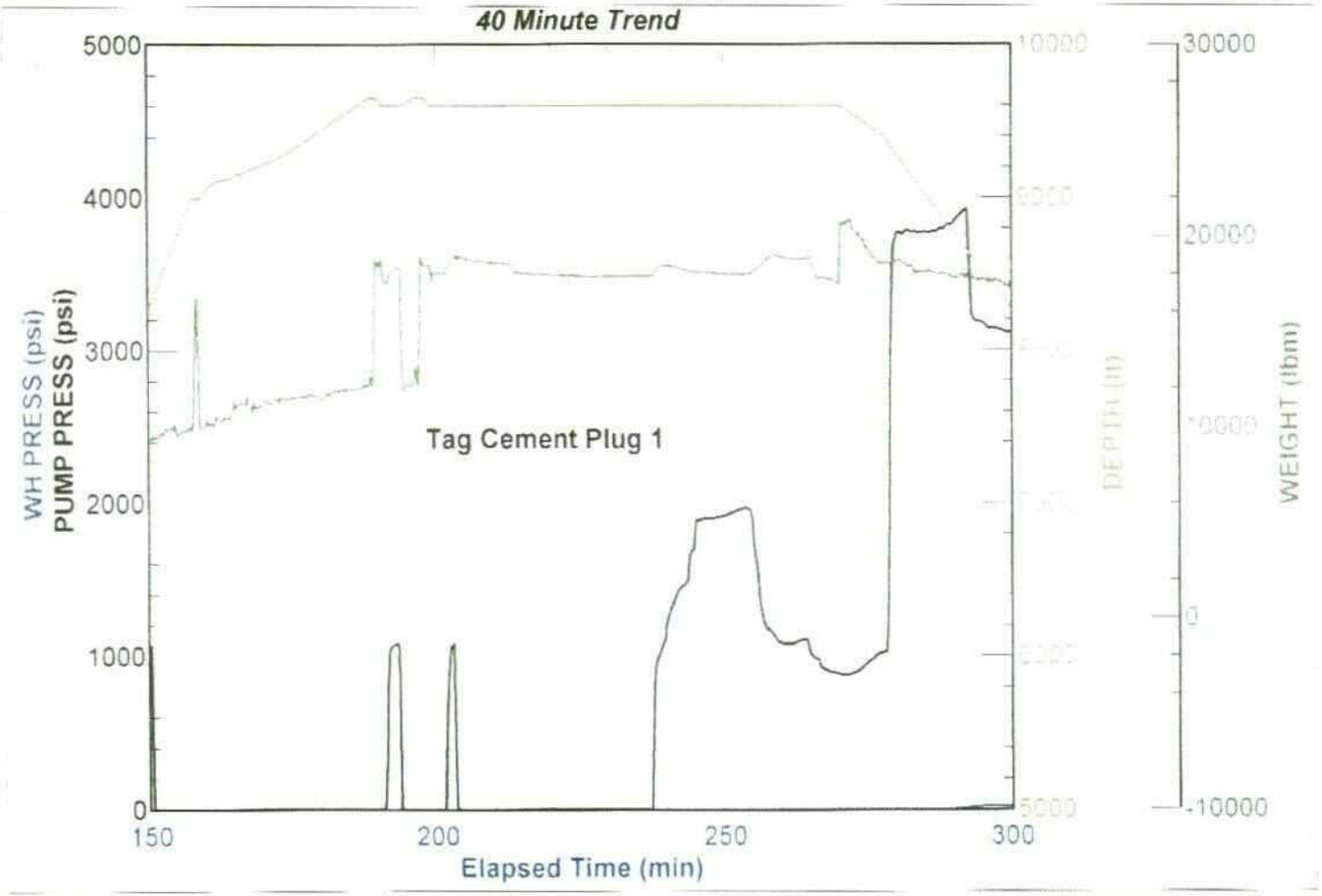
Density:	16.5 ppg	Fluid Loss:		Test Temp:	211 °F
Yield:	1.06 cf/sack	Free Water:		Time to 70bc:	6:40 hrs:min
Mix Water:	4.16 gps	Total Fluid:	4.16 gps	Time to 100 bc:	

Rheology:	600 rpm	300 rpm	200 rpm	100 rpm	6 rpm	3 rpm	PV	YP	Gel Strength	
									10 sec	10 min
@80 °F										
@200 °F										

Consistometer Recording of Bearden Consistency:

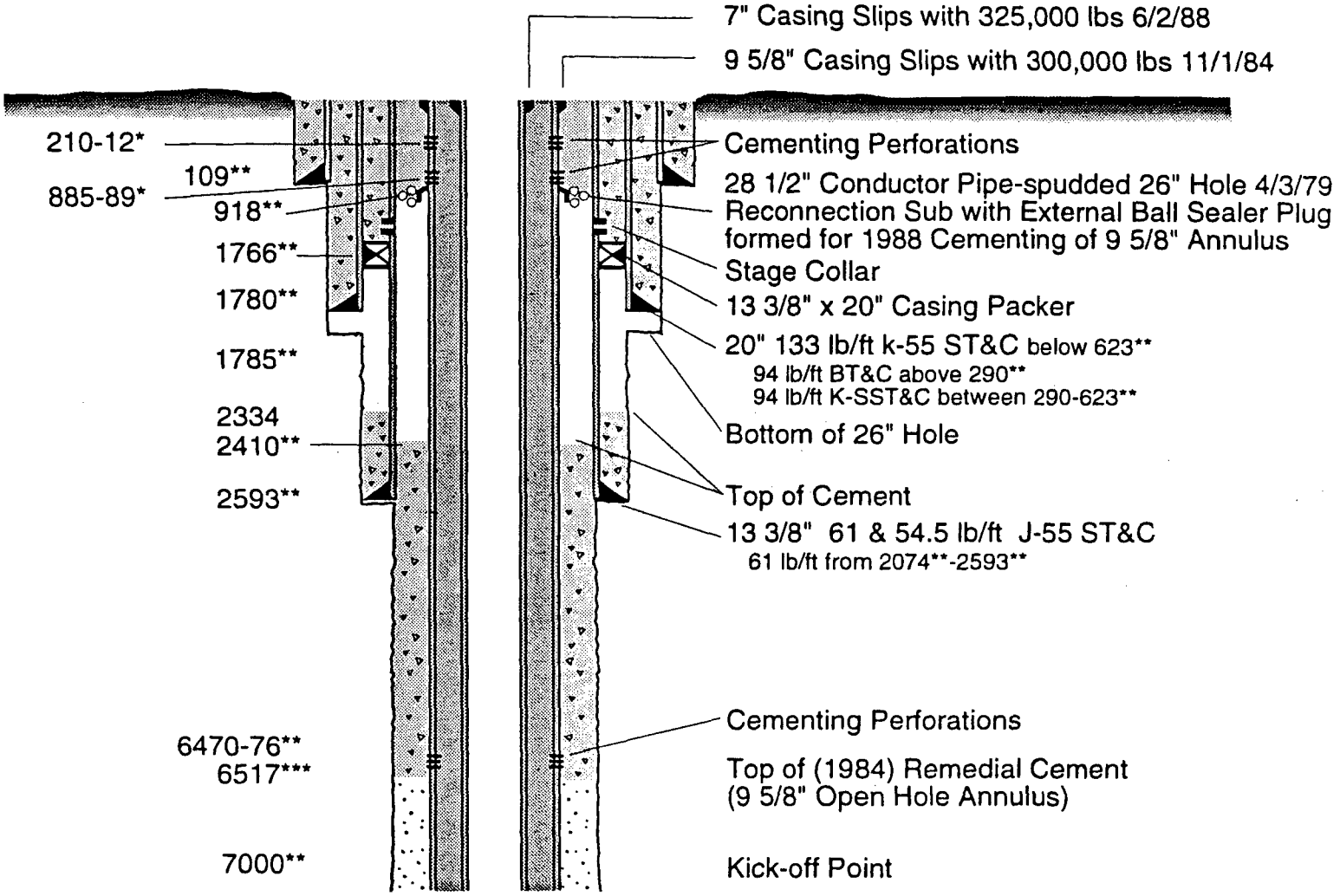


BJ Services JobMaster Program Version 2.61
Job Number: 494091002
Customer: Los Alamos National Labs
Well Name: Fenton Hill EE 2A



Present Configuration of EE 2-A

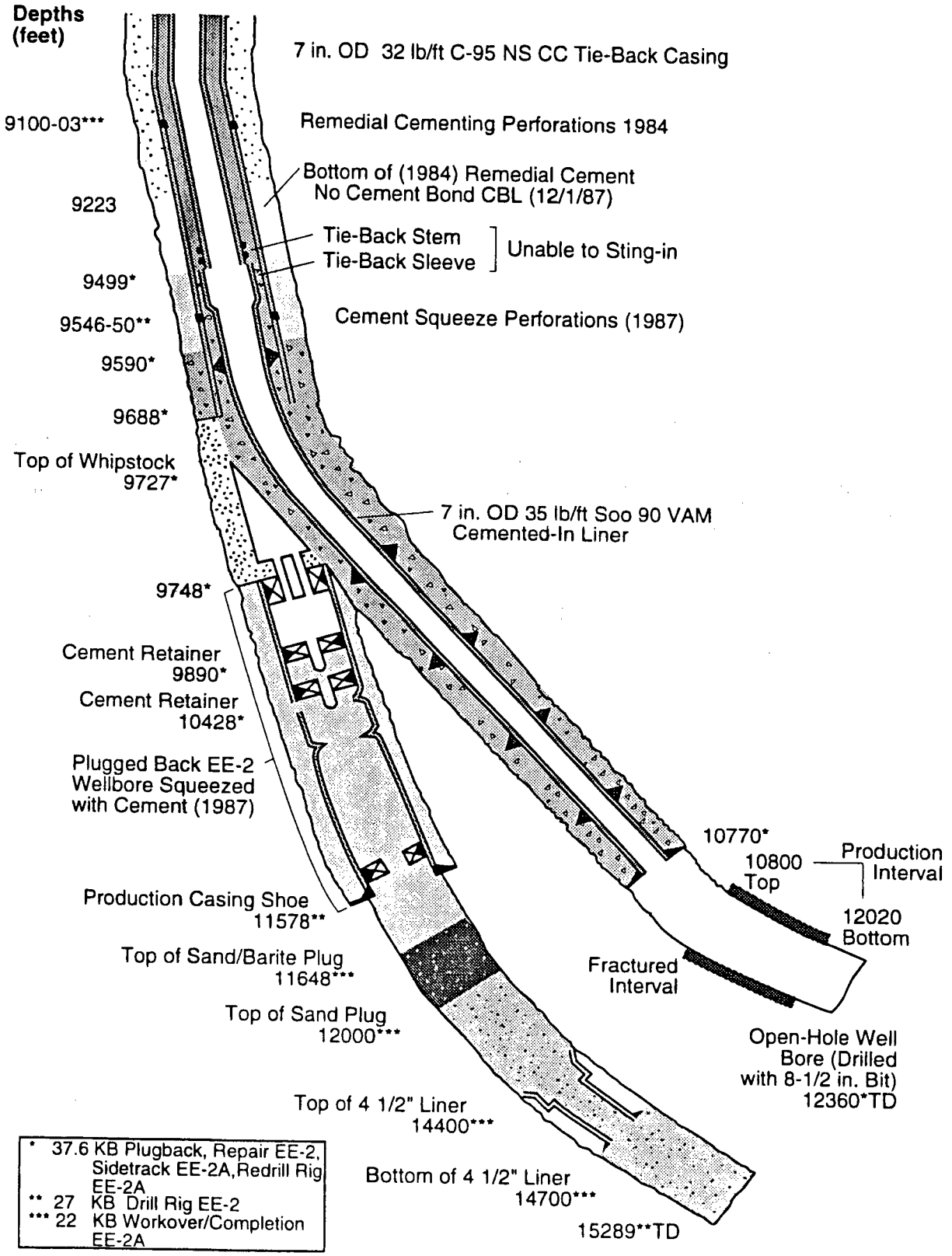
As completed June 17, 1988
(Drawing revised 7/15/91, all depths in ft)



* 37.6 KB Plugback, Repair EE-2, Sidetrack EE-2A, Redrill Rig EE-2A
** 27 KB Drill Rig EE-2
*** 22 KB Workover/Completion EE-2A

Effective 4/30/92

Present Configuration of EE-2A. Completed June 17, 1988
(Drawing revised 7/15/91, all depths in ft)



Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969/Fax: (505) 665-9344

Date: July 10, 2002
Refer to: RRES-WQH: 02-252

Mr. Fred Oneyear
Petroleum Engineer Technician
U.S. Department of the Interior
Bureau of Land Management
P.O. Box 27115
Santa Fe, New Mexico 87502-0115

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, PROCEDURES FOR THE PLUGGING AND ABANDONMENT OF FENTON HILL GEOTHERMAL WELL, EE-2A

Dear Mr. Oneyear:

Enclosed please find the plugging and abandonment procedures for Los Alamos National Laboratory's Fenton Hill geothermal well EE-2A. EE-2A, the last remaining geothermal well at the Fenton Hill Hot Dry Rock (HDR) Geothermal Facility, is being plugged and abandoned as part of the planned decommissioning of the facility. These procedures are being submitted to your agency for review and comment.

Questions about the enclosed procedures should be addressed to Jim Thomson of the Laboratory's Geophysics Group (EES-11) at (505) 667-1924. Please fax your review comments to me at (505) 665-9344 at your earliest convenience.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

BB/tml

Enclosures: a/s

Cy: R. Johnson, NM OCD, Santa Fe, New Mexico, w/enc.
W. Price, NM OCD, Santa Fe, New Mexico, w/enc.
J. Peterson, District Ranger, Jemez Ranger District, Jemez Springs, New Mexico, w/enc.
J. Vozella, DOE/OLASO, w/enc., MS A316
G. Turner, DOE/OLASO, w/enc., MS A316
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M. Fehler, EES-11, w/enc., MS D443
J. Thomson, EES-11, w/enc., MS D443
B. Ramsey, RRES-DO, w/enc., MS J591
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D. McInroy, RRES-R, w/enc., MS M992
W. Neff, RRES-R, w/enc., MS M992
T. Rust, RRES-R, w/enc., MS M992
P. Wardwell, LC, w/enc., MS A187
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

PLUGGING AND ABANDONMENT PROCEDURES FOR GEOTHERMAL WELL EE-2A

Fenton Hill Hot Dry Rock Geothermal Project
Los Alamos National Laboratory

July 1, 2002

Geophysics Group – EES-11
Earth and Environmental Sciences Division

Water Quality and Hydrology Group – RRES-WQH
Risk Reduction and Environmental Stewardship Division

REGULATORY APPROVAL:

Mr. Roy Johnson, N.M. Oil Conservation Division Date

EXTERNAL REVIEWERS:

Mr. Fred Oneyear, U.S. Bureau of Land Management
Mr. John Peterson, U.S. Forest Service, Jemez Ranger District
Ms. Linda Gordan, N.M. Office of the State Engineer

Procedures for abandonment of HDR Well EE-2A
July 1, 2002

Current well configuration: EE-2 was drilled and completed in 1979-80. The original well was damaged following a wellhead failure that ended a massive hydraulic fracturing treatment. Following an extensive well reentry, repair, and plug back procedure, the well was sidetracked and redrilled in 1987-88. The well was completed as a geothermal production well with 7" casing and the annulus cemented to surface. 7-inch OD, 35 lb./ft, S-90, NSCC premium (internal flush) joint threaded and coupled casing was installed from just above the production interval at 10,770 ft to 9,500 ft. A 7-inch OD, 32 lb./ft, C-95, NSCC T&C tie-back string was then installed from 9,500 ft to the surface and cemented-in. The production interval, 10,770' to 12,360' total depth (TD) is uncased open hole. Casing schematics can be found in Attachments 1 and 2. Attachment 3 contains a wellhead diagram. Attachment 4 is a well trajectory survey for well EE-2A.

Although the well was used for geothermal production intermittently for several years, no steam flashing has ever occurred in the wellbore and it is unlikely that any significant scale deposits are present on the inner casing wall.

P&A procedures:

The minimum acceptable coiled tubing diameter for the required operations is 1-1/2" OD.

1) A bridge plug will be set in the 7" casing at 10,700 ft
   a) A casing scraper shall be run to the bridge plug setting depth on wireline or coiled tubing prior to running the bridge plug.
   b) The plug will be capable of maintaining a positive seal against a differential pressure of at least 5,000 psi at a temperature of 430° F
   c) The bridge plug may be deployed on wireline or coiled tubing.
   d) The bridge plug shall be tagged with 1000 lb. set down force using the end of the (cementing shoe on the) coiled tubing prior to pumping the first cement plug to assure proper set and depth.
   e) The initial cement plug shall be tagged to confirm proper location prior to proceeding with mud displacement. This is the only cement plug that will be tagged.
2) A plugging mud shall be displaced into the well from the bottom plug to the surface. The plugging mud shall:
   a) Have sufficient viscosity and density to prevent movement of the cement plugs
   b) Be compatible with the cement slurries proposed.
   c) Remain in the hole between the cement plugs
   d) Contain a sufficient quantity of corrosion inhibitor to provide long-term protection from casing degradation.
3) There is a remote possibility that Hydrogen Sulfide gas may be present in the fluid displaced from the well. Standard industry precautions, ie. H2S monitoring equipment, shall be present and operational during fluid displacement.

4) Every effort shall be made by the vendor to minimize the amount of waste water, mud and materials produced by the operations.
5) Cement plugs may be placed sequentially up the hole. It will not be necessary to tag any cement plugs other than the bottom plug.
6) Required cement plug placement depths, as specified by NMOCD, shall be located in the intervals shown on Table 1. The temperature at the bottom of each interval is included. Cement formulations shall be designed accordingly.
7) After Plug #6 is placed, wash the top of the plug out to 5-ft below the bottom of the wellhead and rig down BOPE and the CTU.
8) Demobilize equipment.

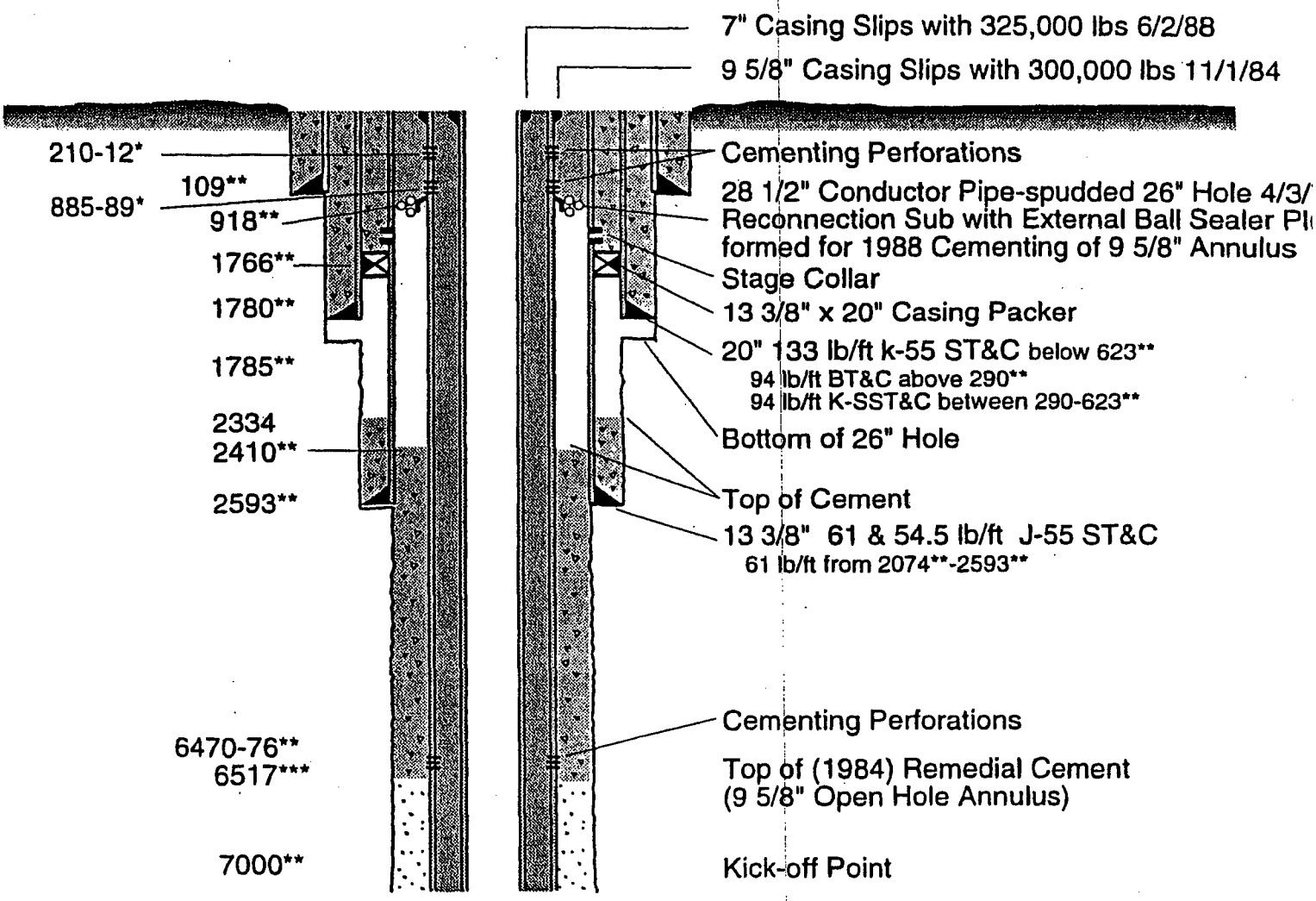
TABLE 1 – NMOCD Plugging Intervals and Estimated Temperature

Plug #	Interval (ft)	Length (linear feet)	Temp.°F *
1	10,700 – 10,500	200	423
2	9,600 – 9,400	200	386
3	6,550 – 6,450	100	285
4	3,550 – 3,450	100	212
5	2,693 – 2,493	200	169
6	75 – surface**	75	53
*	Estimated temperature of the hole prior to circulation.		
**	Circulate out cement to 5-ft below the well head after placing cement.		

ATTACHMENT 1

Present Configuration of EE 2-A

As completed June 17, 1988
(Drawing revised 7/15/91, all depths in ft)

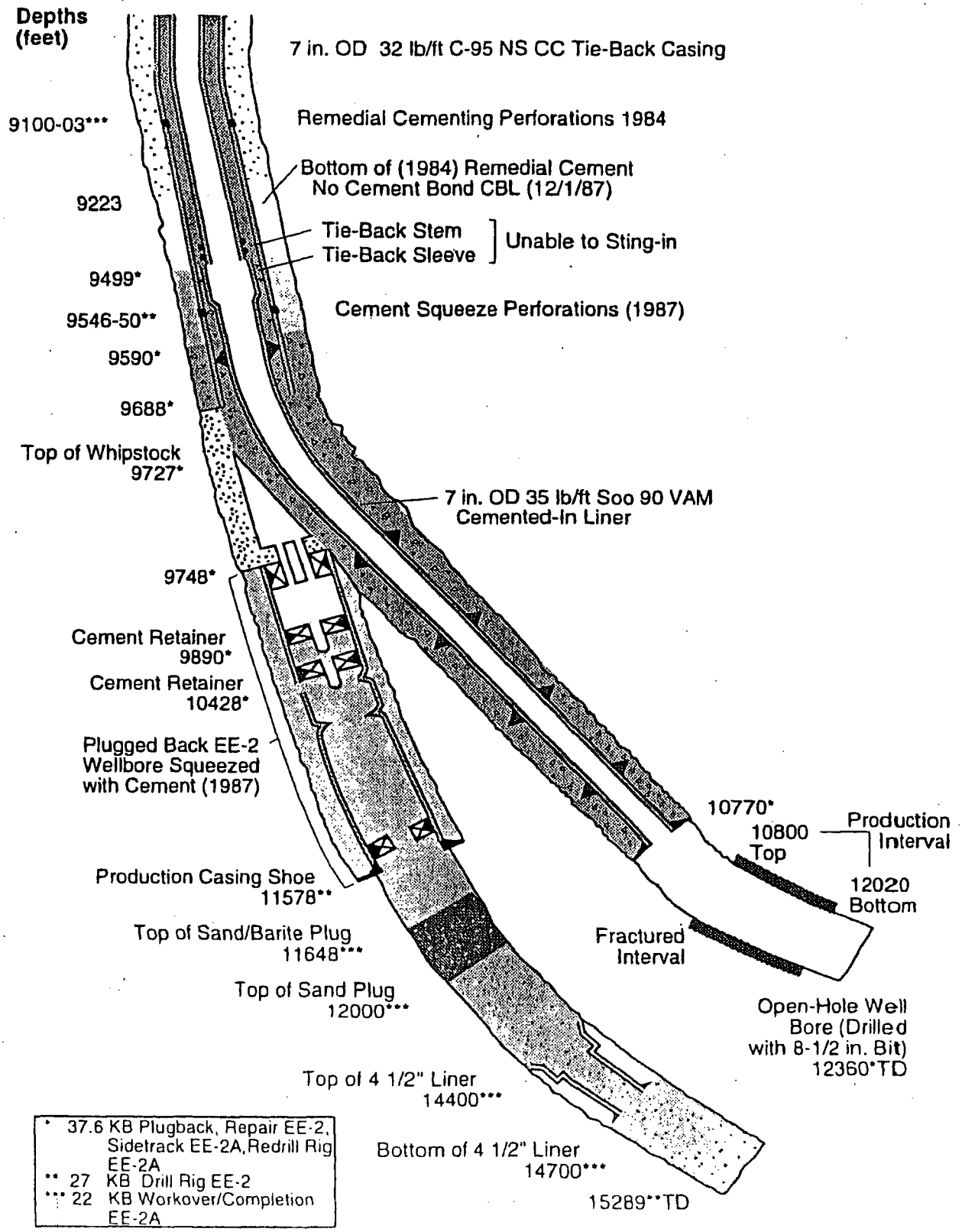


* 37.6 KB Plugback, Repair EE-2, Sidetrack EE-2A,Redrill Rig EE-2A
** 27 KB Drill Rig EE-2
*** 22 KB Workover/Completion EE-2A

ATTACHMENT 2

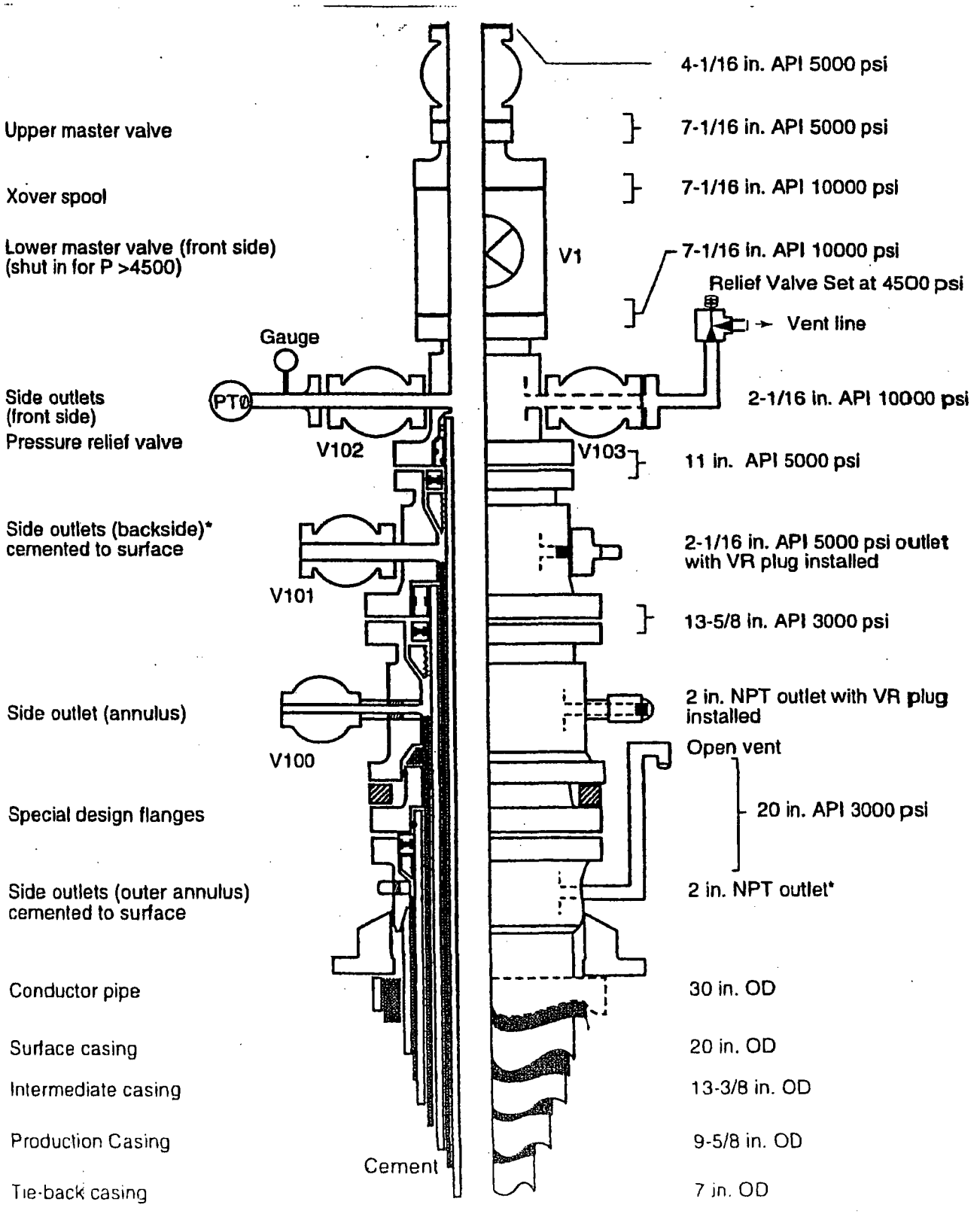
Present Configuration of EE-2A. Completed June 17, 1988

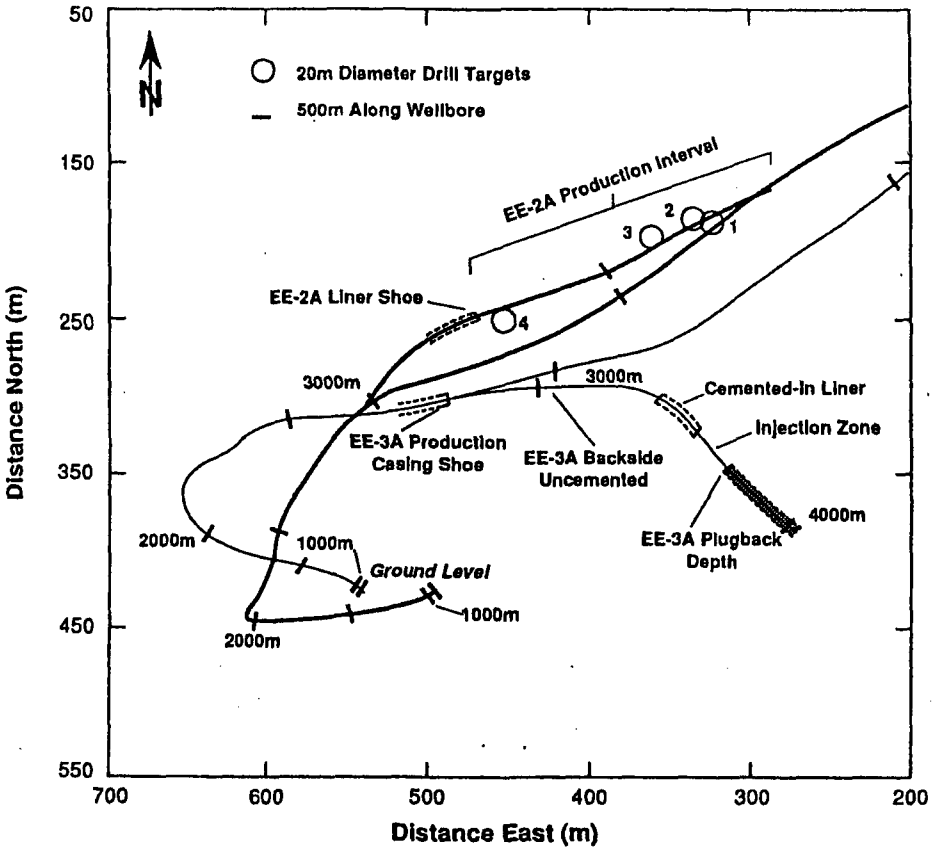
(Drawing revised 7/15/91, all depths in ft)

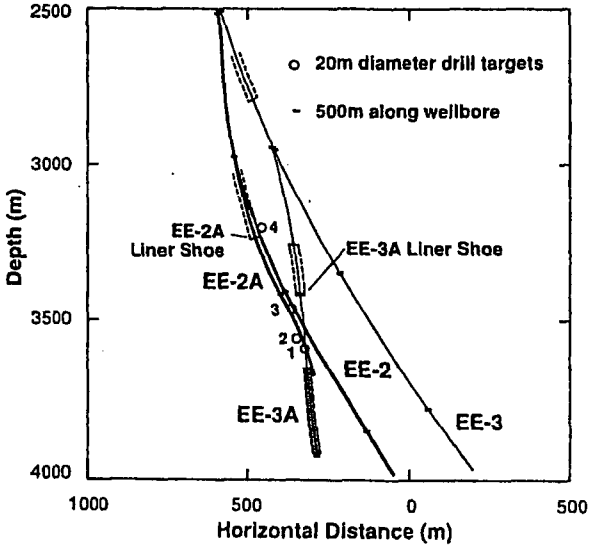


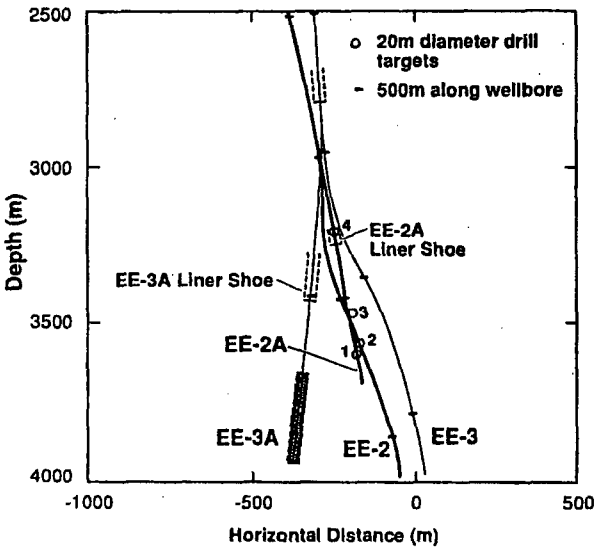
ATTACHMENT 3

EE-2A Production Wellhead









EE-2A targets and drilled trajectory.

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969/Fax: (505) 665-9344

Date: July 10, 2002
Refer to: RRES-WQH: 02-253

Mr. John F. Peterson
Jemez District Ranger
U.S Forest Service
Jemez Ranger District
P.O. Box 150
Jemez Springs, New Mexico 87025

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, PROCEDURES FOR THE PLUGGING AND ABANDONMENT OF FENTON HILL GEOTHERMAL WELL, EE-2A

Dear Mr. Peterson:

Enclosed please find the plugging and abandonment procedures for Los Alamos National Laboratory's Fenton Hill geothermal well EE-2A. EE-2A, the last remaining geothermal well at the Fenton Hill Hot Dry Rock (HDR) Geothermal Facility, is being plugged and abandoned as part of the planned decommissioning of the facility. These procedures are being submitted to your agency for review and comment.

Questions about the enclosed procedures should be addressed to Jim Thomson of the Laboratory's Geophysics Group (EES-11) at (505) 667-1924. Please fax your review comments to me at (505) 665-9344 at your earliest convenience.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

BB/am

Enclosures: a/s

Cy: R. Johnson, NM OCD, Santa Fe, New Mexico, w/enc.
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J. Vozella, DOE/OLASO, w/enc., MS A316
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P. Wardwell, LC, w/enc., MS A187
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

PLUGGING AND ABANDONMENT PROCEDURES FOR GEOTHERMAL WELL EE-2A

Fenton Hill Hot Dry Rock Geothermal Project
Los Alamos National Laboratory

July 1, 2002

Geophysics Group – EES-11
Earth and Environmental Sciences Division

Water Quality and Hydrology Group – RRES-WQH
Risk Reduction and Environmental Stewardship Division

REGULATORY APPROVAL:

Mr. Roy Johnson, N.M. Oil Conservation Division Date

EXTERNAL REVIEWERS:

Mr. Fred Oneyear, U.S. Bureau of Land Management
Mr. John Peterson, U.S. Forest Service, Jemez Ranger District
Ms. Linda Gordan, N.M. Office of the State Engineer

Procedures for abandonment of HDR Well EE-2A
July 1, 2002

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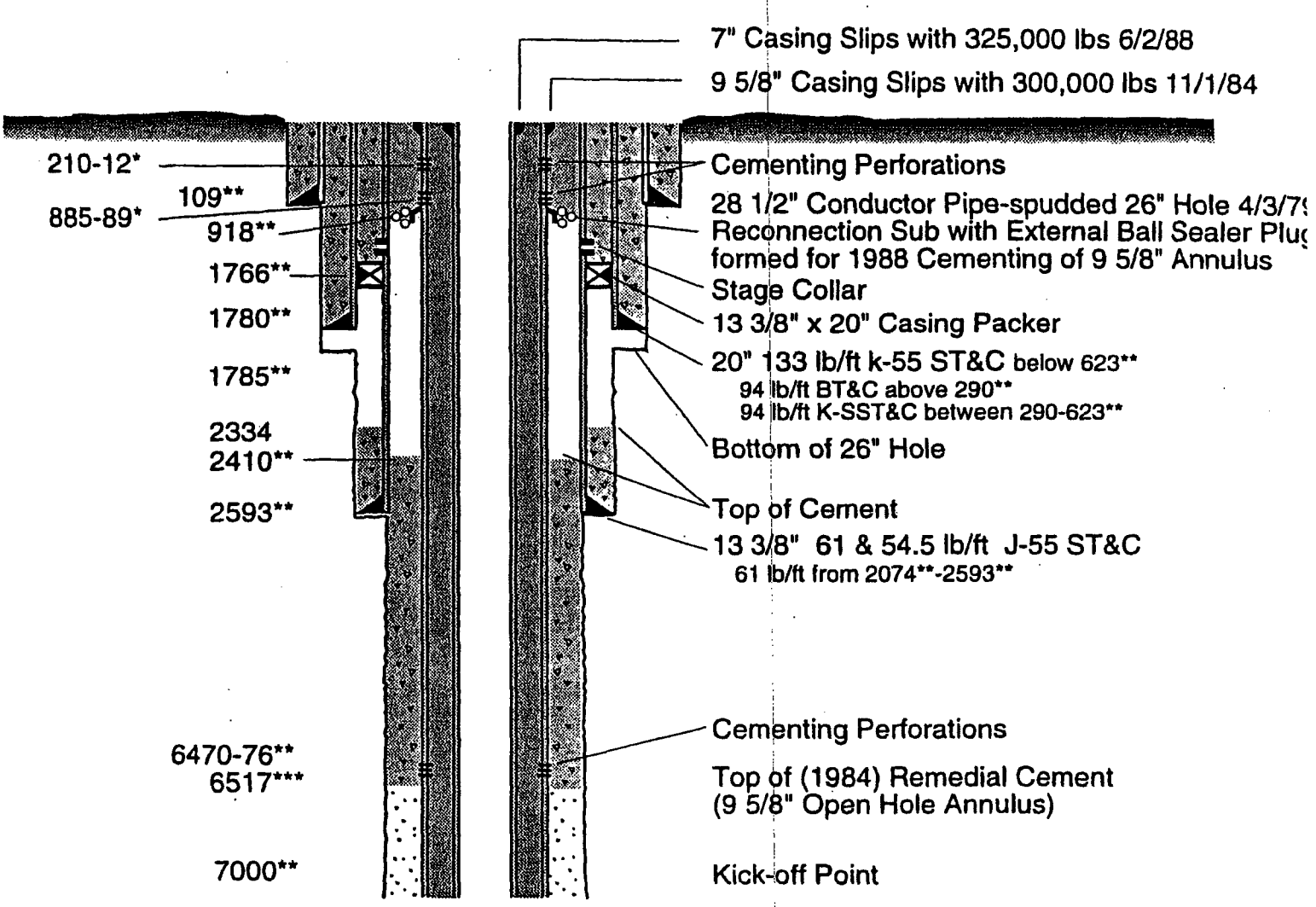
As completed June 17, 1988
(Drawing revised 7/15/91, all depths in ft)

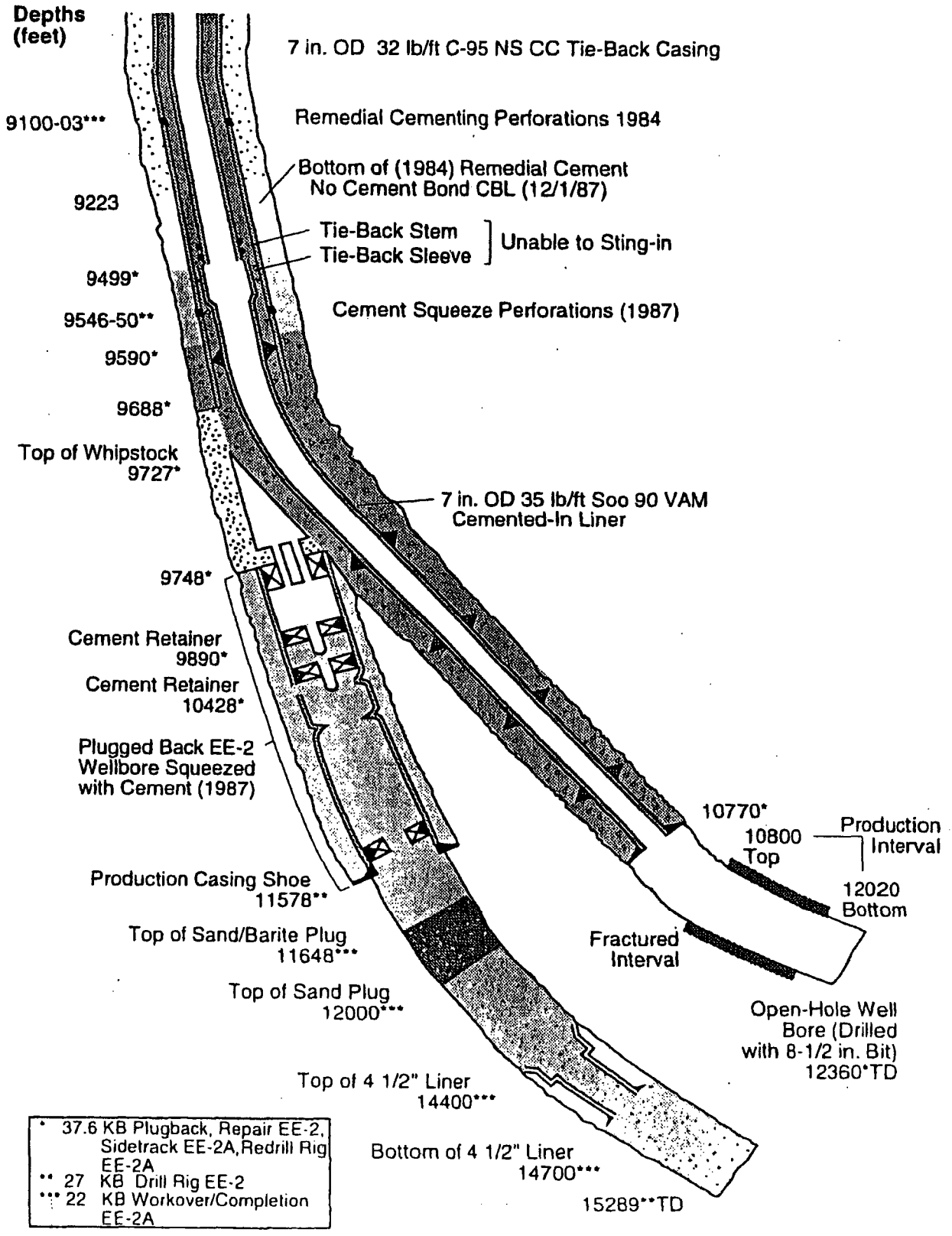


* 37.6 KB Plugback, Repair EE-2, Sidetrack EE-2A, Redrill Rig EE-2A
** 27 KB Drill Rig EE-2
*** 22 KB Workover/Completion EE-2A

ATTACHMENT 2

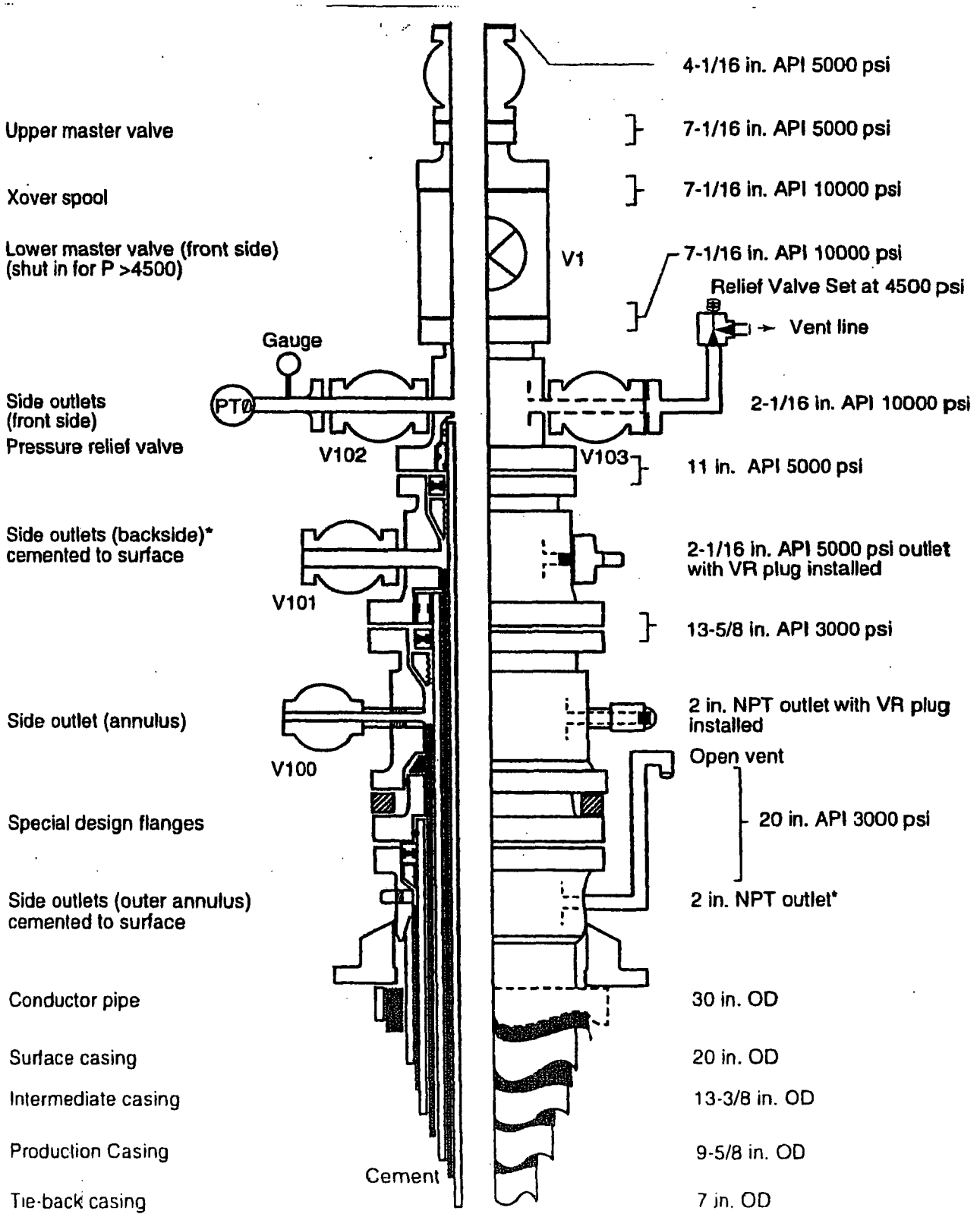
Present Configuration of EE-2A. Completed June 17, 1988

(Drawing revised 7/15/91, all depths in ft)

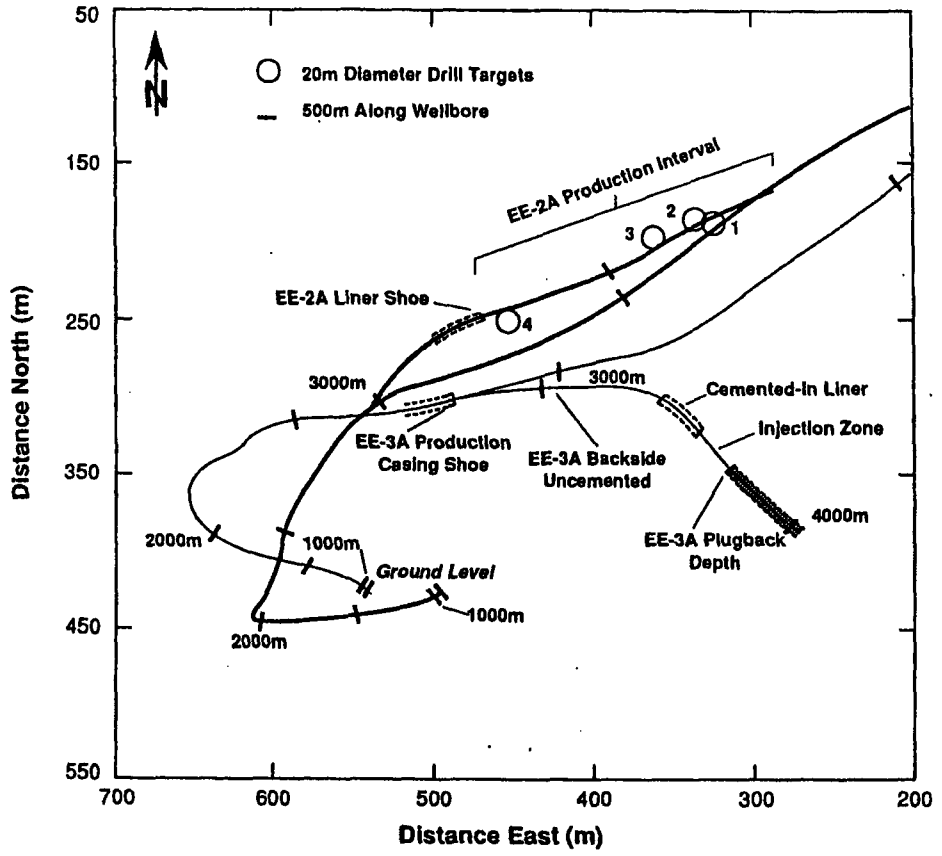


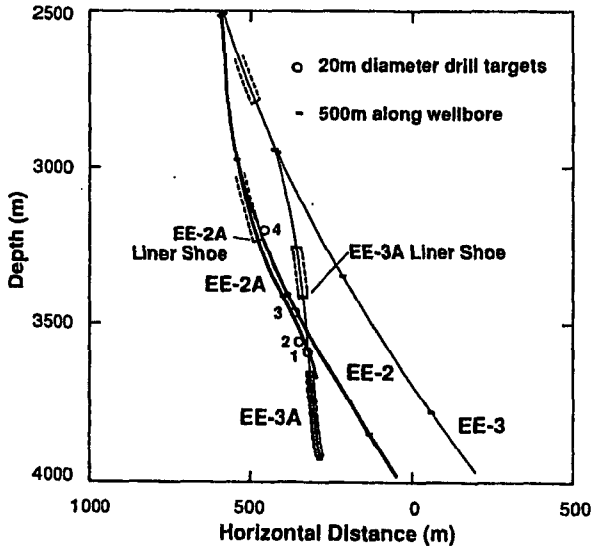
ATTACHMENT 3

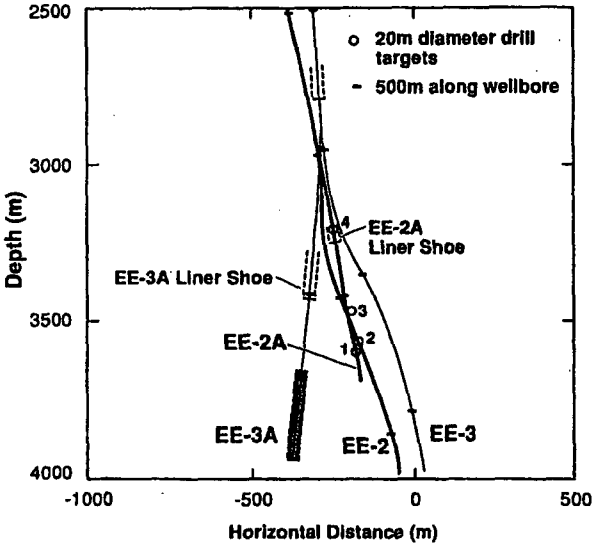
EE-2A Production Wellhead



ATTACHMENT 4







EE-2A targets and drilled trajectory.

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969/Fax: (505) 665-9344

Date: July 10, 2002
Refer to: RRES-WQH: 02-254

Ms. Linda Gordan
Water Rights Division
New Mexico Office of the State Engineer
P.O. Box 25102
Santa Fe, New Mexico 87504-5102

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, PROCEDURES FOR THE PLUGGING AND ABANDONMENT OF FENTON HILL GEOTHERMAL WELL, EE-2A

Dear Ms. Gordan:

Enclosed please find the plugging and abandonment procedures for Los Alamos National Laboratory's Fenton Hill geothermal well EE-2A. EE-2A, the last remaining geothermal well at the Fenton Hill Hot Dry Rock (HDR) Geothermal Facility, is being plugged and abandoned as part of the planned decommissioning of the facility. These procedures are being submitted to your agency for review and comment.

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Sincerely,

Bob Beers
Water Quality & Hydrology Group

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RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

PLUGGING AND ABANDONMENT PROCEDURES FOR GEOTHERMAL WELL EE-2A

Fenton Hill Hot Dry Rock Geothermal Project
Los Alamos National Laboratory

July 1, 2002

Geophysics Group – EES-11
Earth and Environmental Sciences Division

Water Quality and Hydrology Group – RRES-WQH
Risk Reduction and Environmental Stewardship Division

REGULATORY APPROVAL:

Mr. Roy Johnson, N.M. Oil Conservation Division Date

EXTERNAL REVIEWERS:

Mr. Fred Oneyear, U.S. Bureau of Land Management
Mr. John Peterson, U.S. Forest Service, Jemez Ranger District
Ms. Linda Gordan, N.M. Office of the State Engineer

Procedures for abandonment of HDR Well EE-2A
July 1, 2002

Current well configuration: EE-2 was drilled and completed in 1979-80. The original well was damaged following a wellhead failure that ended a massive hydraulic fracturing treatment. Following an extensive well reentry, repair, and plug back procedure, the well was sidetracked and redrilled in 1987-88. The well was completed as a geothermal production well with 7" casing and the annulus cemented to surface. 7-inch OD, 35 lb./ft, S-90, NSCC premium (internal flush) joint threaded and coupled casing was installed from just above the production interval at 10,770 ft to 9,500 ft. A 7-inch OD, 32 lb./ft, C-95, NSCC T&C tie-back string was then installed from 9,500 ft to the surface and cemented-in. The production interval, 10,770' to 12,360' total depth (TD) is uncased open hole. Casing schematics can be found in Attachments 1 and 2. Attachment 3 contains a wellhead diagram. Attachment 4 is a well trajectory survey for well EE-2A.

Although the well was used for geothermal production intermittently for several years, no steam flashing has ever occurred in the wellbore and it is unlikely that any significant scale deposits are present on the inner casing wall.

P&A procedures:

The minimum acceptable coiled tubing diameter for the required operations is 1-1/2" OD.

1) A bridge plug will be set in the 7" casing at 10,700 ft
   a) A casing scraper shall be run to the bridge plug setting depth on wireline or coiled tubing prior to running the bridge plug.
   b) The plug will be capable of maintaining a positive seal against a differential pressure of at least 5,000 psi at a temperature of 430° F
   c) The bridge plug may be deployed on wireline or coiled tubing.
   d) The bridge plug shall be tagged with 1000 lb. set down force using the end of the (cementing shoe on the) coiled tubing prior to pumping the first cement plug to assure proper set and depth.
   e) The initial cement plug shall be tagged to confirm proper location prior to proceeding with mud displacement. This is the only cement plug that will be tagged.
2) A plugging mud shall be displaced into the well from the bottom plug to the surface. The plugging mud shall:
   a) Have sufficient viscosity and density to prevent movement of the cement plugs
   b) Be compatible with the cement slurries proposed.
   c) Remain in the hole between the cement plugs
   d) Contain a sufficient quantity of corrosion inhibitor to provide long-term protection from casing degradation.
3) There is a remote possibility that Hydrogen Sulfide gas may be present in the fluid displaced from the well. Standard industry precautions, ie. H2S monitoring equipment, shall be present and operational during fluid displacement.

4) Every effort shall be made by the vendor to minimize the amount of waste water, mud and materials produced by the operations.
5) Cement plugs may be placed sequentially up the hole. It will not be necessary to tag any cement plugs other than the bottom plug.
6) Required cement plug placement depths, as specified by NMOCD, shall be located in the intervals shown on Table 1. The temperature at the bottom of each interval is included. Cement formulations shall be designed accordingly.
7) After Plug #6 is placed, wash the top of the plug out to 5-ft below the bottom of the wellhead and rig down BOPE and the CTU.
8) Demobilize equipment.

TABLE 1 – NMOCD Plugging Intervals and Estimated Temperature

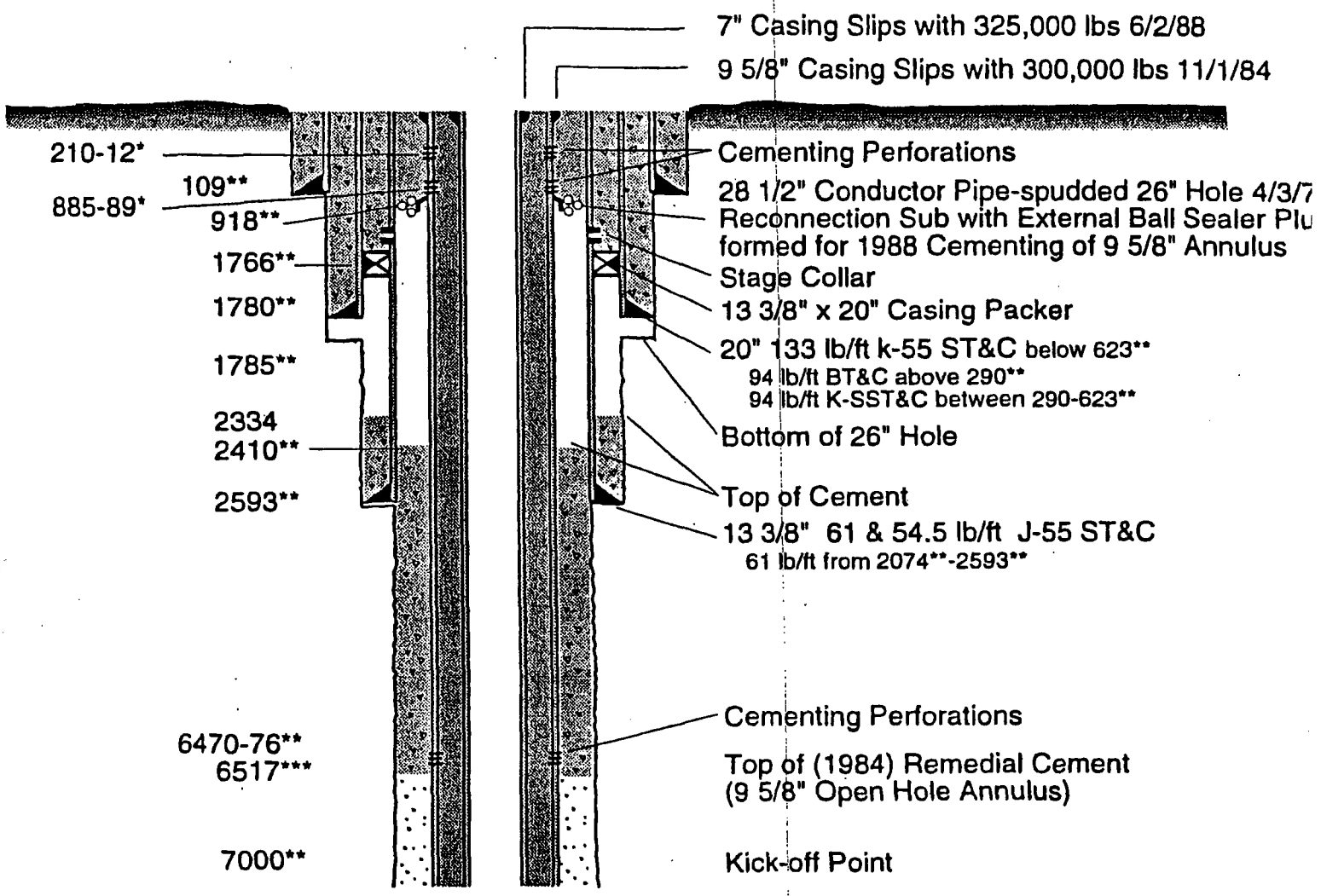
Plug #	Interval (ft)	Length (linear feet)	Temp.°F *
1	10,700 – 10,500	200	423
2	9,600 – 9,400	200	386
3	6,550 – 6,450	100	285
4	3,550 – 3,450	100	212
5	2,693 – 2,493	200	169
6	75 – surface**	75	53
*	Estimated temperature of the hole prior to circulation.		
**	Circulate out cement to 5-ft below the well head after placing cement.		

ATTACHMENT 1

Present Configuration of EE 2-A

As completed June 17, 1988

(Drawing revised 7/15/91, all depths in ft)



* 37.6 KB Plugback, Repair EE-2, Sidetrack EE-2A, Redrill Rig EE-2A

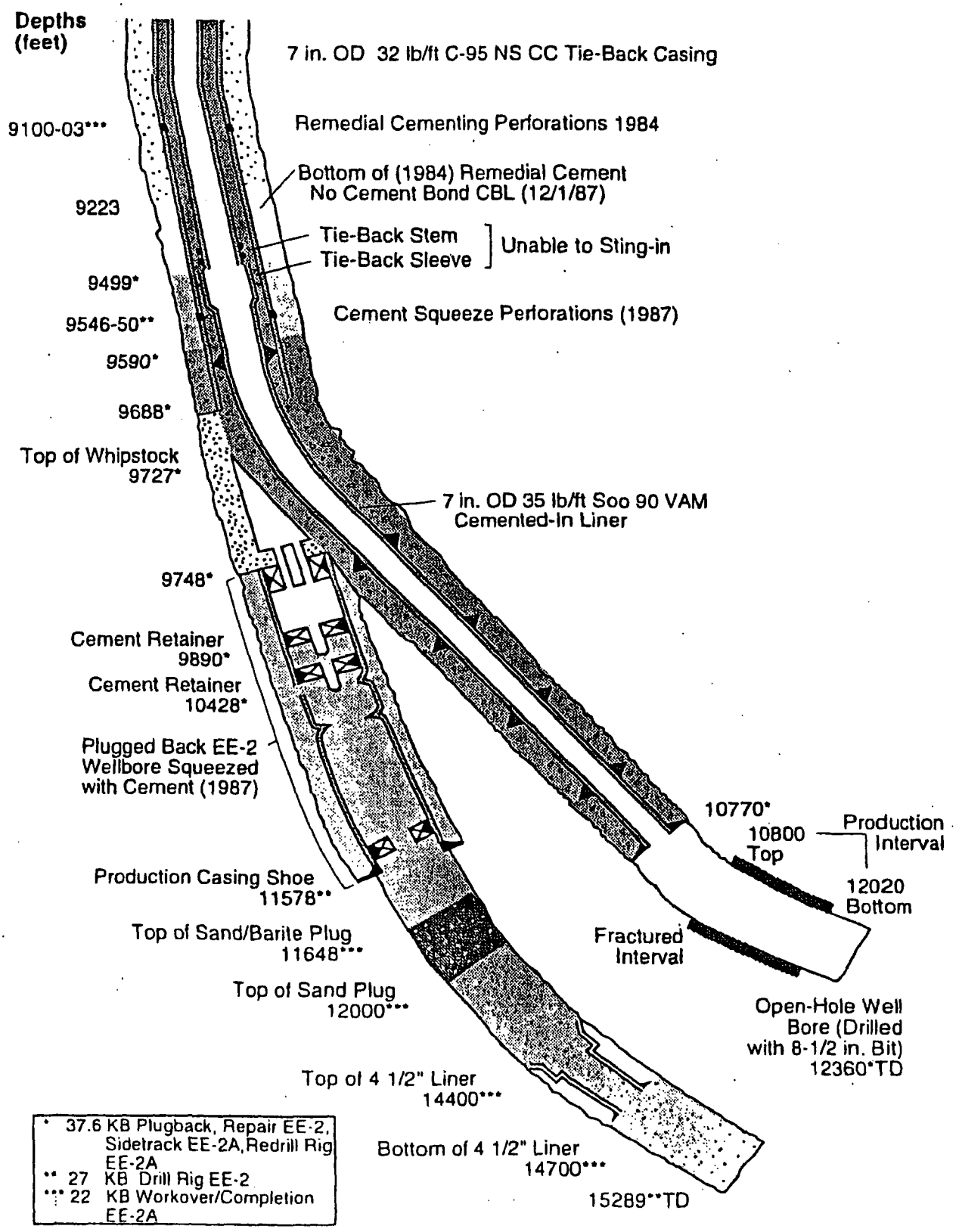
** 27 KB Drill Rig EE-2

*** 22 KB Workover/Completion EE-2A

ATTACHMENT 2

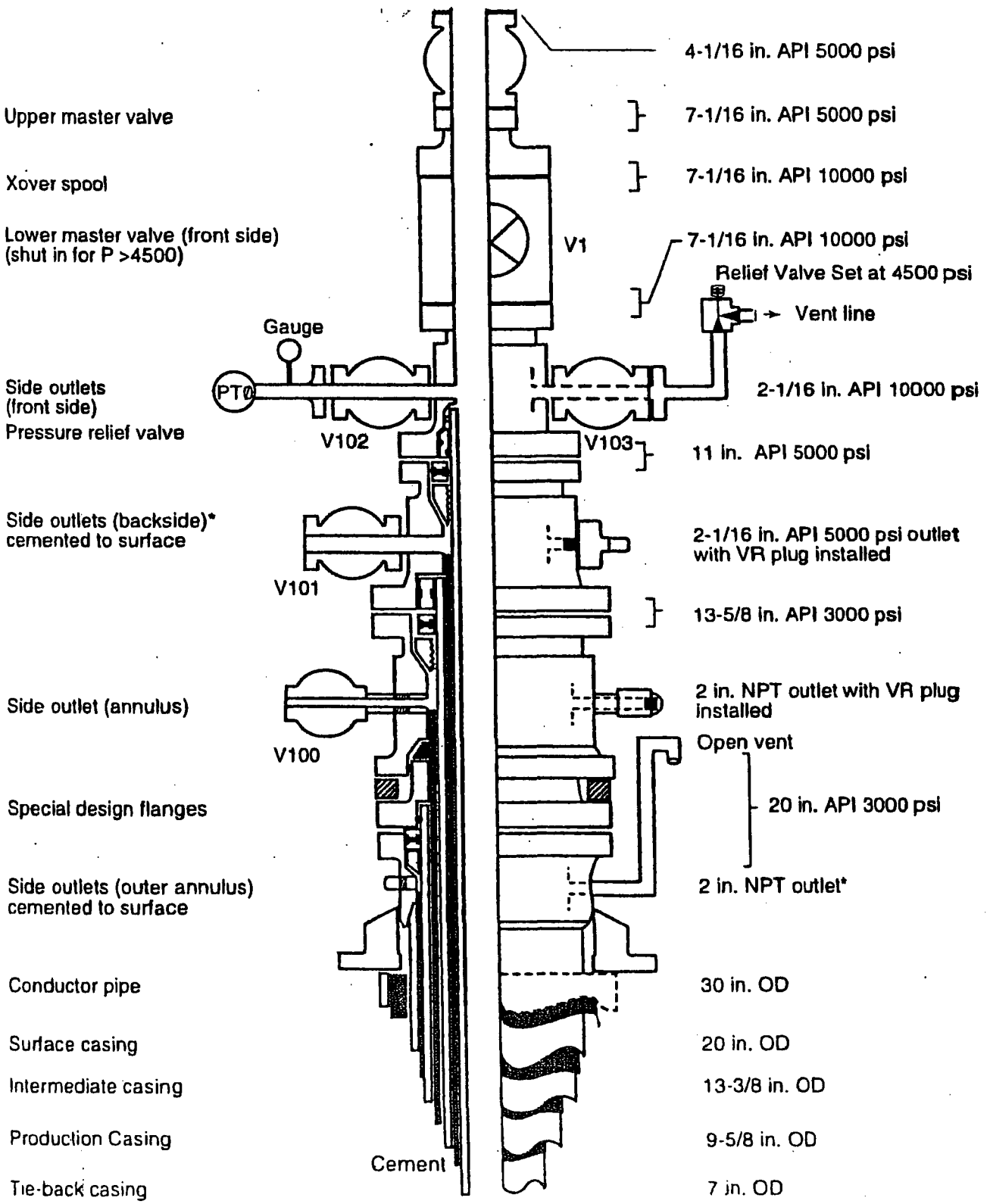
Present Configuration of EE-2A. Completed June 17, 1988

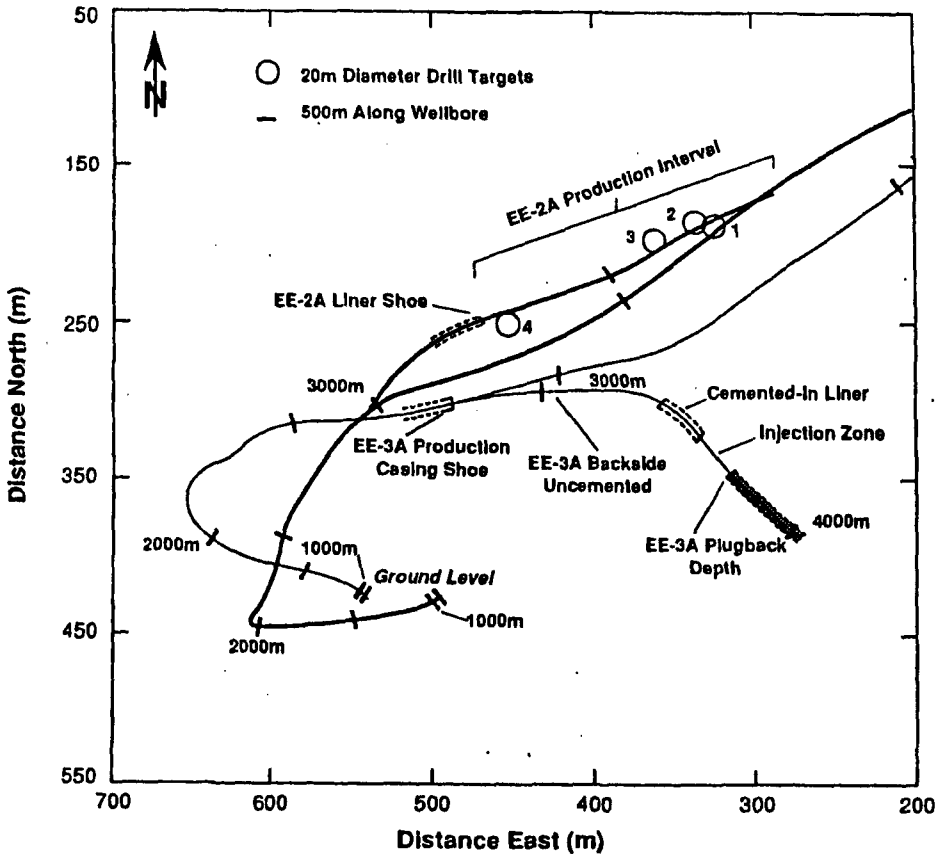
(Drawing revised 7/15/91, all depths in ft)

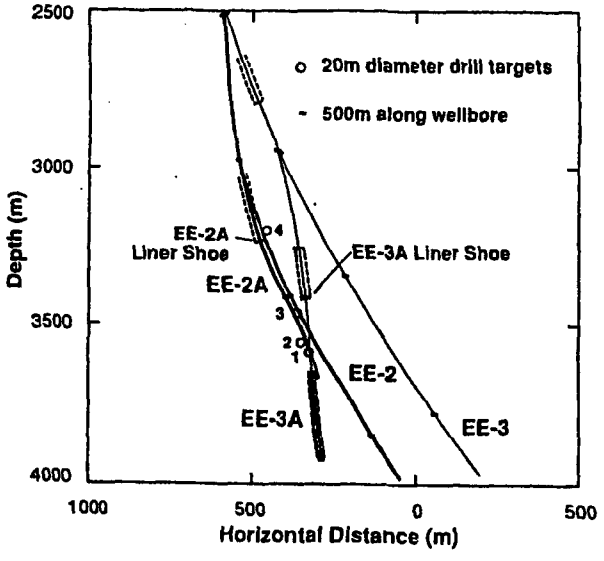


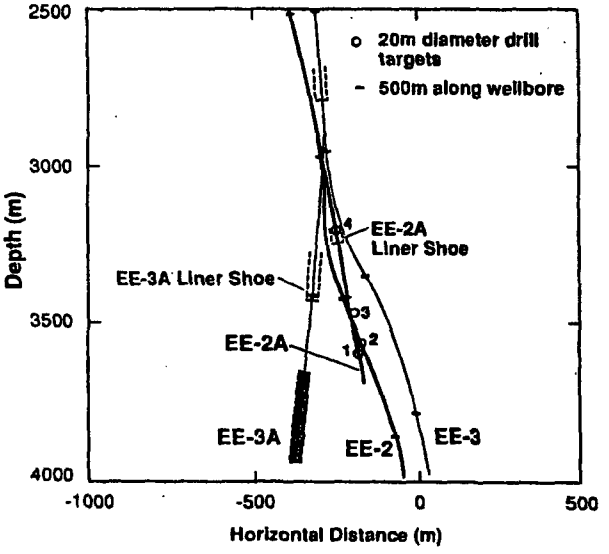
ATTACHMENT 3

EE-2A Production Wellhead









EE-2A targets and drilled trajectory.

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969/Fax: (505) 665-9344

Date: July 10, 2002
Refer to: RRES-WQH: 02-251

Mr. Roy E. Johnson
Senior Petroleum Geologist
Supervisor District IV
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, SUNDRY NOTICE FOR PLUGGING AND ABANDONMENT OF FENTON HILL GEOTHERMAL WELL, EE-2A

Dear Mr. Johnson:

As required under New Mexico Oil Conservation Division Rule 202, Form C-103, *Sundry Notices and Reports on Wells,* must be filed with your agency prior to the commencement of plugging operations. Enclosed are the original and two (2) copies of Form C-103 for the plugging and abandonment of Fenton Hill geothermal well EE-2A, the last remaining geothermal well at the Fenton Hill Hot Dry Rock (HDR) Geothermal Facility. Included with Form C-103 is a copy of Los Alamos National Laboratory's procedures for the plugging and abandonment of EE-2A.

Questions regarding the enclosed Sundry Notice and attachments should be addressed to Jim Thomson of the Laboratory's Geophysics Group (EES-11) at (505) 667-1924.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

BB/am

Enclosures: a/s

Cy: W. Price, NM OCD, Santa Fe, New Mexico, w/enc.
J. Peterson, District Ranger, Jemez Ranger District, Jemez Springs, New Mexico, w/enc.
J. Vozella, DOE/OLASO, w/enc., MS A316
G. Turner, DOE/OLASO, w/enc., MS A316
J. Holt, ADO, w/enc., MS A104
P. Weber, EES-DO, w/enc., MS D446
J. Hansen, EES-DO, w/enc., MS D446
M. Fehler, EES-11, w/enc., MS D443
J. Thomson, EES-11, w/enc., MS D443
B. Ramsey, RRES-DO, w/enc., MS J591
K. Hargis, RRES-DO, w/enc., MS J591
D. Stavert, RRES-EP, w/enc., MS J978
S. Rae, RRES-WQH, w/enc., MS K497
D. Rogers, RRES-WQH, w/enc., MS K497
D. McInroy, RRES-R, w/enc., MS M992
W. Neff, RRES-R, w/enc., MS M992
T. Rust, RRES-R, w/enc., MS M992
P. Wardwell, LC, w/enc., MS A187
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised March 25, 1999

WELL API NO.
EE-2A (non-API)

5. Indicate Type of Lease
STATE ☐ FEE ☐

6. State Oil & Gas Lease No.
N/A

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

1. Type of Well:
Oil Well ☐ Gas Well ☐ Other – Experimental geothermal production well

7. Lease Name or Unit Agreement Name:
Fenton Hill Hot Dry Rock Geothermal Project

2. Name of Operator
Los Alamos National Laboratory

8. Well No. – EE-2A

3. Address of Operator
P.O.Box 1663, Los Alamos, NM 87545

9. Pool name or Wildcat
N/A

10. Well Location

Unit Letter_____: well is located 1609 feet from the East line and 1405 feet from the North line

Section 13 Township 19N Range 2E NMPM Sandoval County

10. Elevation *(Show whether DR, RKB, RT, GR, etc.)*
KB

11. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	X	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	PLUG AND ABANDONMENT	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPLETION	☐	CASING TEST AND CEMENT JOB	☐		
OTHER:			☐	OTHER:			☐

12. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompilation.

Please find detailed procedure and well diagrams attached. It is currently estimated that the abandonment will occur in September, 2002. NMOCD will be notified by LANL of the exact time that the abandonment work will commence at least 48 hours in advance.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Paul G. Weber TITLE Division Leader DATE 9 July '02

Type or print name PAUL G. WEBER Telephone No. 505-667-5776

(This space for State use)

APPPROVED BY_____ TITLE_____ DATE_____

Conditions of approval, if any:

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
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1301 W. Grand Ave., Artesia, NM 88210
District III
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Energy, Minerals and Natural Resources

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Form C-103
Revised March 25, 1999

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SIGNATURE Paul G. Weber TITLE Division Leader DATE 9 July '02

Type or print name PAUL G. WEBER Telephone No. 505-667-577

(This space for State use)

APPPROVED BY_____ TITLE_____ DATE_____

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Form C-103
Revised March 25, 1999

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SIGNATURE Paul G. Weber TITLE Division Leader DATE 9 July 02

Type or print name PAUL G. WEBER Telephone No. 505-667-577

(This space for State use)

APPPROVED BY_____ TITLE_____ DATE_____

Conditions of approval, if any:

PLUGGING AND ABANDONMENT PROCEDURES FOR GEOTHERMAL WELL EE-2A

Fenton Hill Hot Dry Rock Geothermal Project
Los Alamos National Laboratory

July 1, 2002

Geophysics Group – EES-11
Earth and Environmental Sciences Division

Water Quality and Hydrology Group – RRES-WQH
Risk Reduction and Environmental Stewardship Division

REGULATORY APPROVAL:

Mr. Roy Johnson, N.M. Oil Conservation Division Date

EXTERNAL REVIEWERS:

Mr. Fred Oneyear, U.S. Bureau of Land Management
Mr. John Peterson, U.S. Forest Service, Jemez Ranger District
Ms. Linda Gordan, N.M. Office of the State Engineer

Procedures for abandonment of HDR Well EE-2A
July 1, 2002

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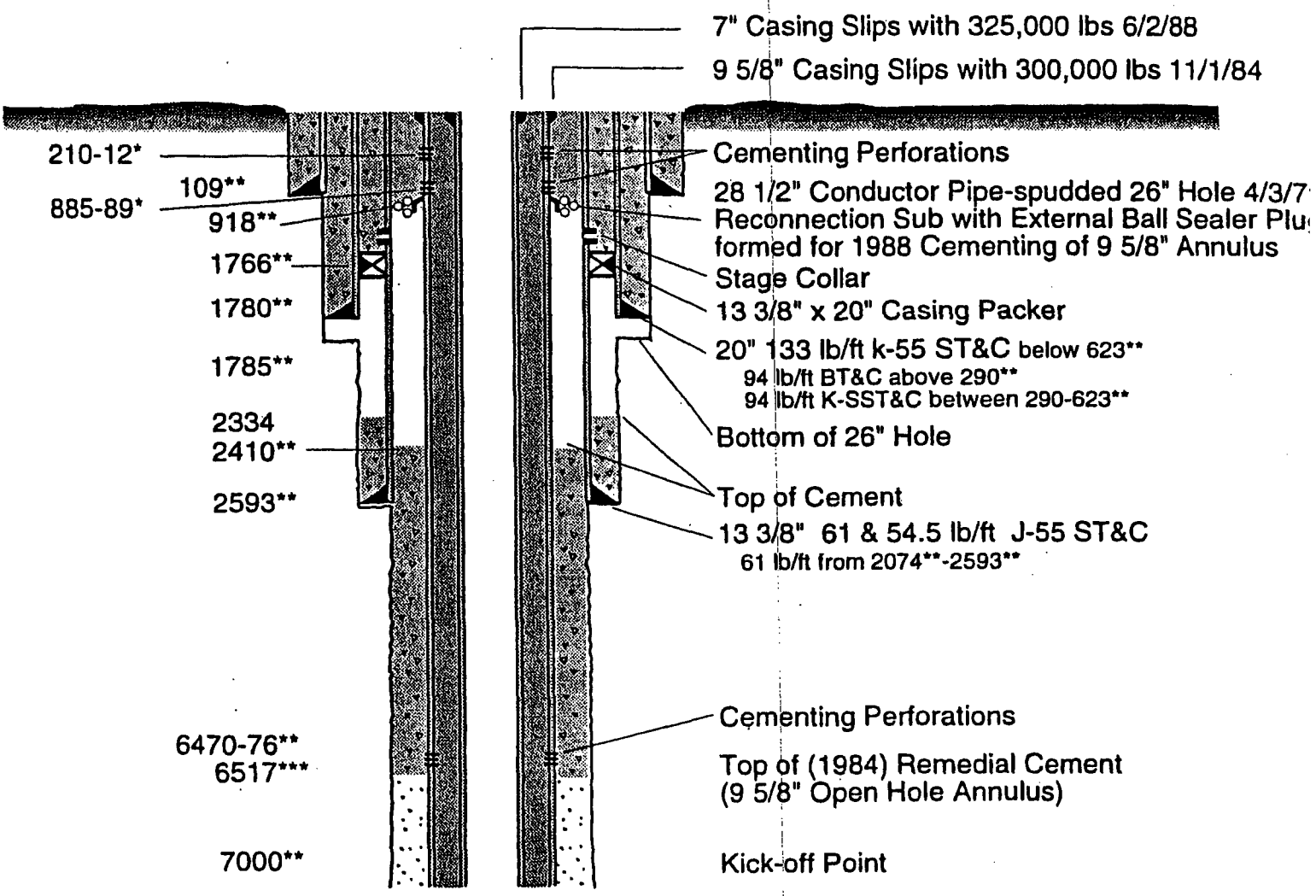
6	75 – surface**	75	53
*	Estimated temperature of the hole prior to circulation.		
**	Circulate out cement to 5-ft below the well head after placing cement.		

ATTACHMENT 1

Present Configuration of EE 2-A

As completed June 17, 1988
(Drawing revised 7/15/91, all depths in ft)

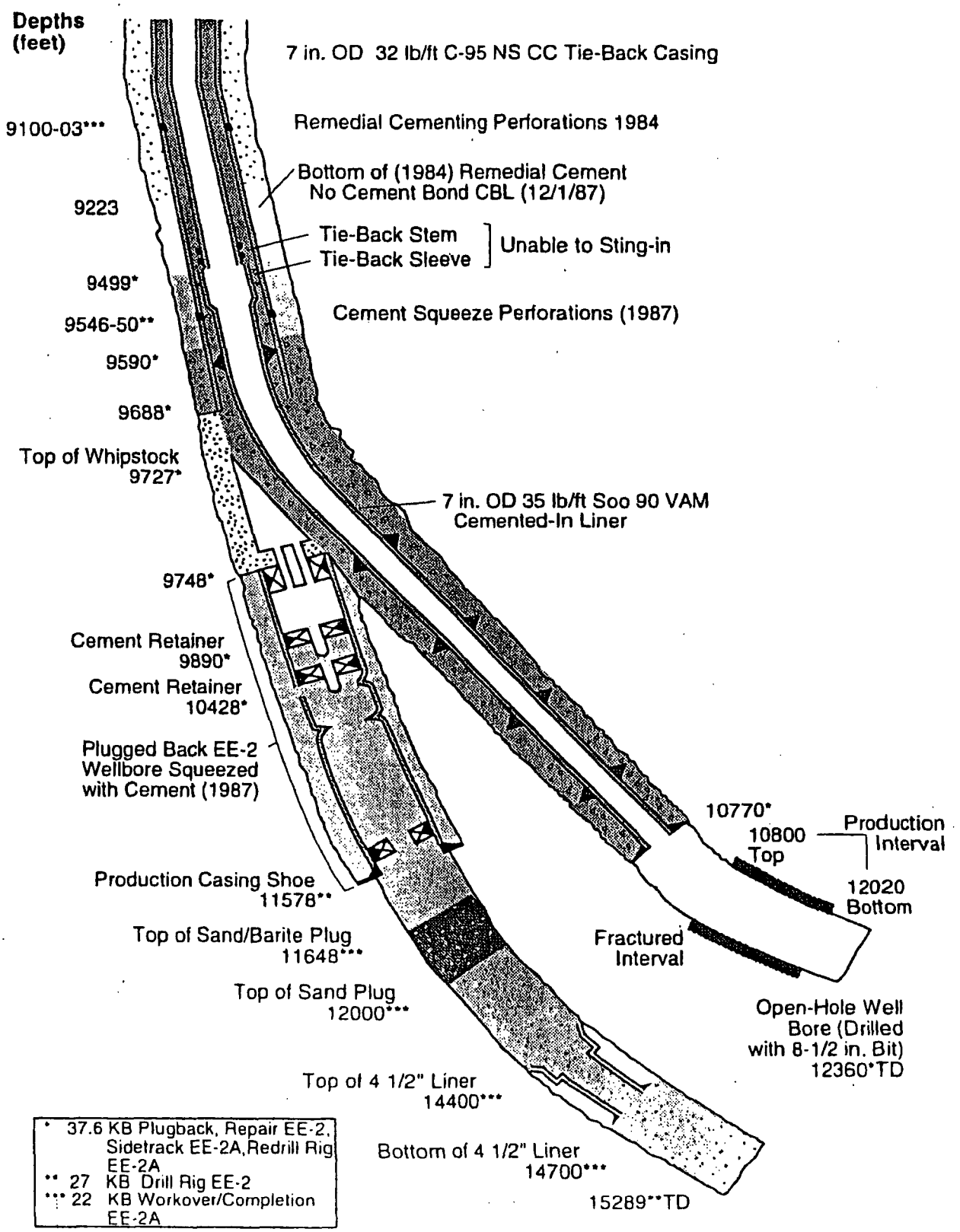


* 37.6 KB Plugback, Repair EE-2, Sidetrack EE-2A, Redrill Rig EE-2A
** 27 KB Drill Rig EE-2
*** 22 KB Workover/Completion EE-2A

ATTACHMENT 2

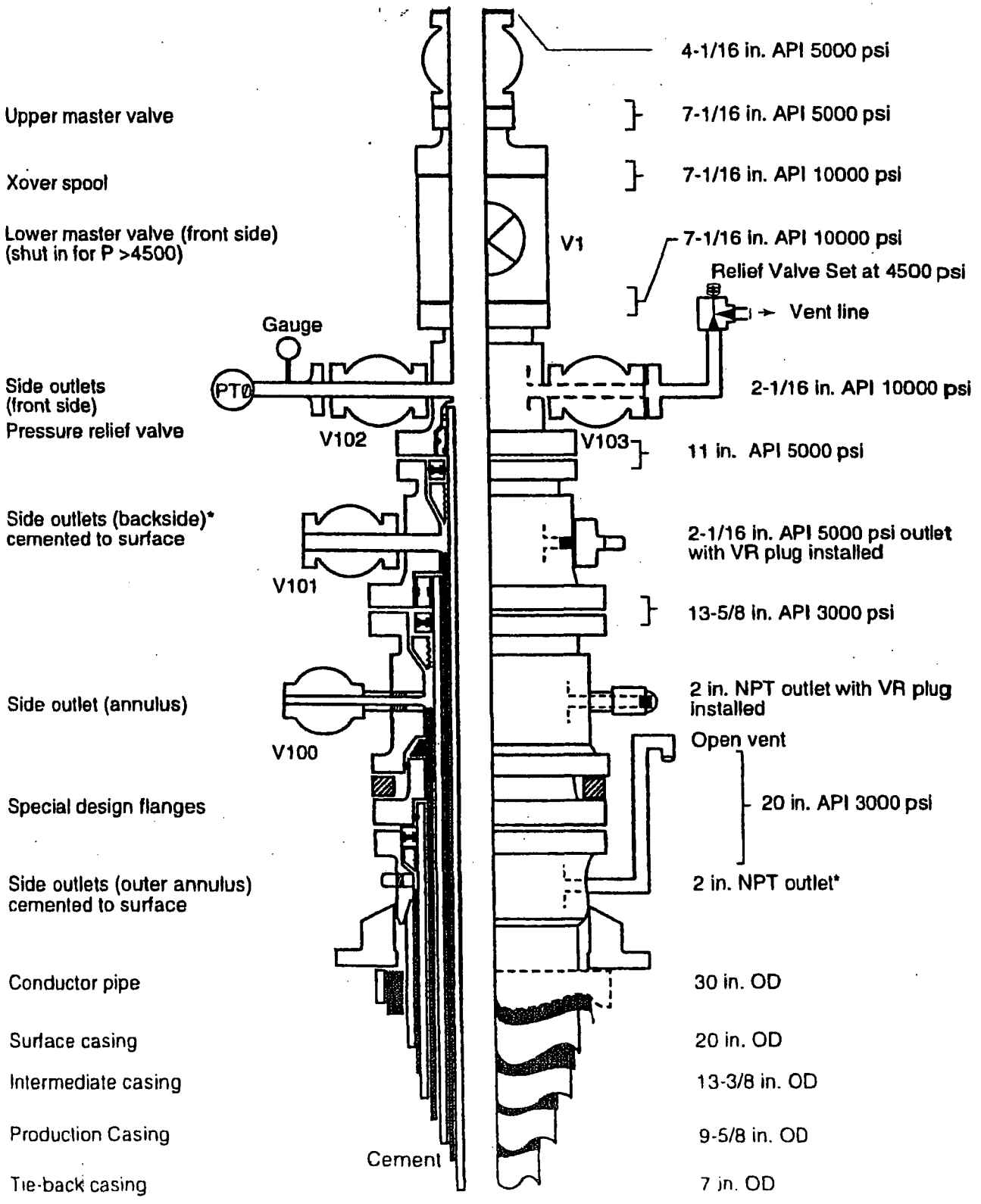
Present Configuration of EE-2A. Completed June 17, 1988

(Drawing revised 7/15/91, all depths in ft)

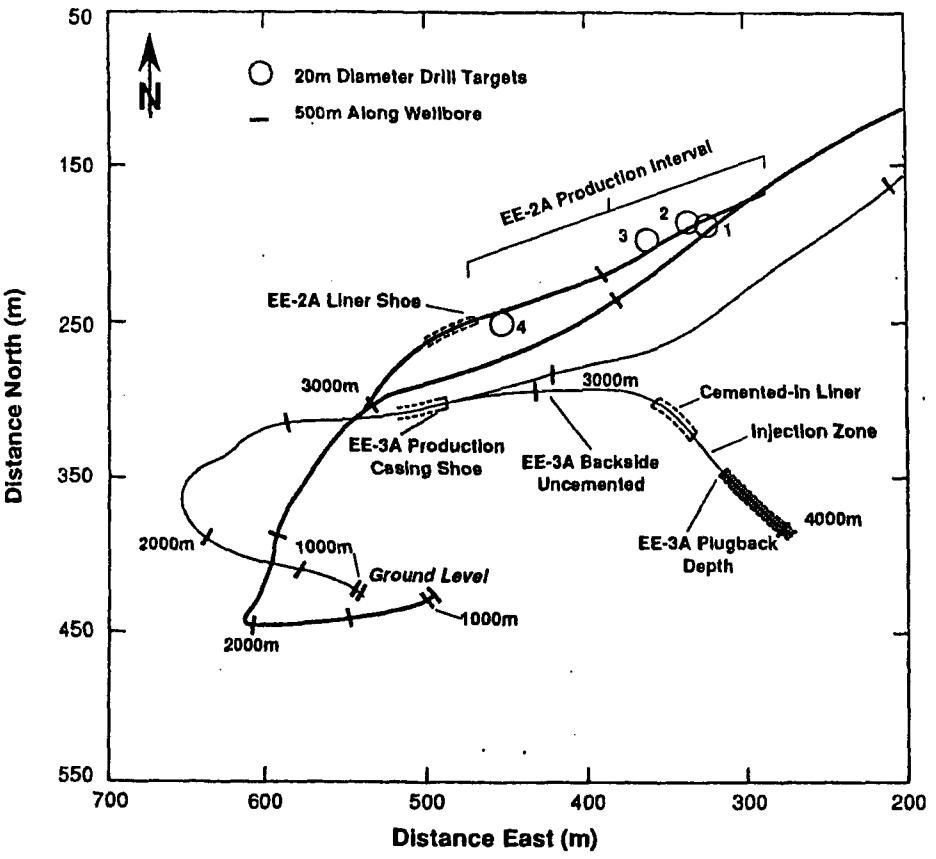


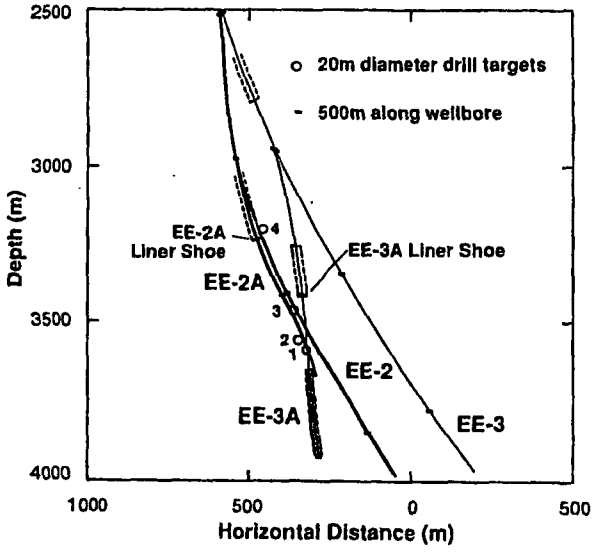
ATTACHMENT 3

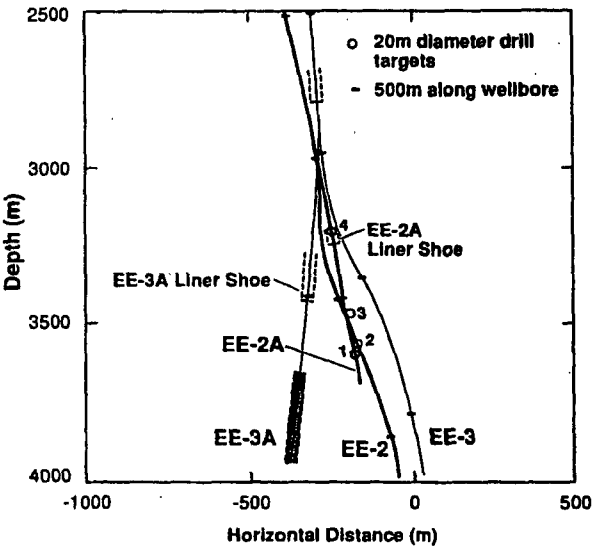
EE-2A Production Wellhead



ATTACHMENT 4







EE-2A targets and drilled trajectory.

Price, Wayne

From: Price, Wayne
Sent: Thursday, August 15, 2002 2:56 PM
To: 'bbeers@lanl.gov'
Cc: Foust, Denny; Johnson, Roy
Subject: Closure Plan for Fenton Hill Geothermal 1-MG Service Pond and EE-2A Production Well

Dear Mr. Beers:

The OCD is in receipt of the above subject plan dated August 14, 2002 and hereby approves of the plan with the following conditions:

1. All waste shall be disposed of at an OCD approved site.

2. A final report shall be submitted for OCD approval by June 30, 2003.

Please be advised that NMOCD approval of this plan does not relieve Los Alamos National Laboratory of liability should their operations fail to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve Los Alamos National Laboratory of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Sincerely:

Wayne Price
New Mexico Oil Conservation Division
1220 S. Saint Francis Drive
Santa Fe, NM 87505
505-476-3487
fax: 505-476-3462
E-mail: WPRICE@state.nm.us

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969/Fax: (505) 665-9344

RECEIVED
AUG 15 2002
Environmental Bureau
Oil Conservation Division

Date: August 14, 2002
Refer to: RRES-WQH: 02-315

Mr. Wayne Price
Petroleum Engineering Specialist
Oil Conservation Division
New Mexico Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

SUBJECT: CLOSURE PLAN, FENTON HILL GEOTHERMAL FACILITY, LOS ALAMOS NATIONAL LABORATORY

Dear Mr. Price:

Enclosed, please find Los Alamos National Laboratory's Closure Plan for the 1-million gallon (MG) service pond and EE-2A wellhead at the Fenton Hill Geothermal Facility. This Closure Plan is being submitted to your agency for approval in accordance with the requirements of Discharge Plan GW-031, as issued by the New Mexico Oil Conservation Division on October 13, 2000. A copy of the Closure Plan has also been submitted to the USDA Forest Service, Jemez Ranger District, for their concurrent review since the Fenton Hill Geothermal Facility is located on Forest Service property.

As you are aware, in 1996, under the direction of the U.S. Department of Energy, the Laboratory began decommissioning the Fenton Hill Geothermal Facility; all geothermal wells were plugged and abandonment with the exception of the EE-2A production well. The two principal decommissioning activities currently remaining at the facility are (1) the plugging and abandonment of well EE-2A, and (2) closure of the 1-MG service pond. This plan covers the closure of the 1-MG service pond and the removal of the aboveground portions of well EE-2A (concrete pad, surface casing). Procedures for the plugging and abandonment of well EE-2A were submitted to Mr. Roy E. Johnson, NM OCD District IV Office, on July 10, 2002. Mr. Johnson subsequently approved the procedures on July 19, 2002.

During our April 17, 2002, meeting at your Santa Fe office, we discussed the option of injecting geothermal fluids from the 1-MG service pond into well EE-2A for permanent disposal. Mr. Johnson approved the Laboratory's injection permit application (Form G-112) on July 10, 2002. However, after further consideration, the Laboratory has decided not to inject any geothermal fluids into well EE-2A due to technical problems associated with injection. As presented in the Closure Plan, the Laboratory is considering other two disposal options for the geothermal fluids: (1) on-site treatment (evaporation) of the fluids with off-site disposal of the solids, or (2) off-site treatment and disposal. A final path

Please contact me at (505) 667-7969 should you have any questions regarding the enclosed Closure Plan.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

BB/am

Enclosures: a/s

Cy: J. Peterson, Forest Service, Jemez Ranger District, Jemez Springs, New Mexico, w/o enc.
A. Ferrell, Forest Service, Jemez Ranger District, Jemez Springs, New Mexico, w/o enc.
C. Linn, Forest Service, Santa Fe National Forest, Santa Fe, New Mexico, w/o enc.
M. Khatibi, Pueblo of Jemez, Jemez Pueblo, New Mexico, w/enc.
J. Garcia, CER-30, w/enc., MS A117
J. Vozella, DOE/OLASO, w/o enc., MS A316
G. Turner, DOE/OLASO, w/enc., MS A316
J. Holt, ADO, w/o enc., MS A104
P. Weber, EES-DO, w/enc., MS D446
J. Hansen, EES-DO, w/enc., MS D446
J. Thomson, EES-11, w/enc., MS D443
S. Archuleta, P-FM, w/enc., MS D459
B. Ramsey, RRES-DO, w/enc., MS J591
K. Hargis, RRES-DO, w/o enc., MS J591
D. Stavert, RRES-EP, w/enc., MS J978
S. Rae, RRES-WQH, w/enc., MS K497
D. Rogers, RRES-WQH, w/o enc., MS K497
D. McInroy, RRES-R, w/o enc., MS M992
T. Rust, RRES-R, w/enc., MS M992
P. Wardwell, LC, w/enc., MS A187
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

Los Alamos
NATIONAL LABORATORY

Risk Reduction & Environmental Stewardship Division
Water Quality & Hydrology Group (RRES-WQH)
PO Box 1663, MS K497
Los Alamos, New Mexico 87545
(505) 667-7969/Fax: (505) 665-9344

Date: June 24, 2002
Refer to: RRES-WQH: 02-249

Mr. Roy E. Johnson
Senior Petroleum Geologist
District IV Supervisor
New Mexico Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

SUBJECT: INJECTION PERMIT APPLICATION FOR LOS ALAMOS NATIONAL LABORATORY'S FENTON HILL GEOTHERMAL WELL EE-2A

Dear Mr. Johnson:

As required by New Mexico Oil Conservation Division Rule 701, enclosed is Form G-112, Application to Place Well on Injection, for Los Alamos National Laboratory's Fenton Hill Geothermal Well EE-2A. The proposed use of this injection permit is for the permanent disposal of approximately 80,000 gallons geothermal fluid currently being stored in the lined 1 million-gallon service pond at the Fenton Hill site. Chemical analysis of the geothermal fluid has been enclosed. The Laboratory proposes to inject into well EE-2A with permanent disposal in the Phase II Hot Dry Rock (HDR) geothermal reservoir. Following injection, EE-2A will be plugged and abandoned in accordance with NM OCD regulations.

The Phase II HDR reservoir was artificially created by hydraulic fracturing and is located in granite at a depth of approximately 11,000 feet. An impermeable barrier of approximately 8,500 feet exists between the reservoir and the formation top at 2,500 feet. The proposed injection well, EE-2A, was originally completed as a production well with 7-inch casing from surface to just above the injection interval. The 7-inch string is cemented from the casing shoe to surface. All other geothermal production and injection wells in the area have been abandoned.

Questions regarding the enclosed application and enclosures should be addressed to Jim Thomson of the Laboratory's Geophysics Group (EES-11) at (505) 667-1924.

Sincerely,

Bob Beers
Water Quality & Hydrology Group

BB/tml

Enclosures: a/s

Cy: W. Price, NM OCD, Santa Fe, New Mexico, w/enc.
J. Peterson, District Ranger, Jemez Ranger District, Jemez Springs, New Mexico, w/enc.
J. Vozella, DOE/OLASO, w/enc., MS A316
G. Turner, DOE/OLASO, w/enc., MS A316
J. Holt, ADO, w/enc., MS A104
P. Weber, EES-DO, w/enc., MS D446
J. Hansen, EES-DO, w/enc., MS D446
M. Fehler, EES-11, w/enc., MS D443
J. Thomson, EES-11, w/enc., MS D443
B. Ramsey, RRES-DO, w/enc., MS J591
K. Hargis, RRES-DO, w/enc., MS J591
D. Stavert, RRES-EP, w/enc., MS J978
S. Rae, RRES-WQH, w/enc., MS K497
D. Rogers, RRES-WQH, w/enc., MS K497
D. McInroy, RRES-R, w/enc., MS M992
W. Neff, RRES-R, w/enc., MS M992
T. Rust, RRES-R, w/enc., MS M992
P. Wardwell, LC, w/enc., MS A187
RRES-WQH File, w/enc., MS K497
IM-5, w/enc., MS A150

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

Oil Conservation Div.
2040 Pacheco St.
Santa Fe, NM 87505

Form G-112
Adopted 10-1-74
Revised 10-1-78

APPLICATION TO PLACE WELL ON INJECTION-GEOTHERMAL RESOURCES AREA

Operator		Address	
Los Alamos National Laboratory		P.O.Box 1663, Los Alamos, NM 87545	
Lease Name	**Well No.**	**Field**	**County**
Federal Interagency Agreement	EE-2A	Fenton Hill	Sandoval

Location

Unit Letter _____ ; Well is Located 1609 Feet From The East Line And 1405 Feet From The North

Line, Section 13 Township 19N Range 2E NMPM.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
Conductor Pipe	28-1/2"	109'		Surface	Visual
	20"	1,780'		Surface	Visual
Surface Casing	13-3/8"	2,593'		2,334'	CBL
	9-5/8"	9,688'		2,410'	CBL
Long String	7"	10,700'		Surface	CBL
Tubing			Name, Model and Depth of Tubing Packer		

Name of Proposed Injection Formation	Top of Formation	Bottom of Formation
Granite	2,500'	Unknown

Is Injection Through Tubing, Casing, or Annulus?	Perforations or Open Hole?	Proposed Interval(s) of Injection
7" casing	open hole	10,800' - 12,020

Is This a New Well Drilled For Injection?	If Answer is No, For What Purpose was Well Originally Drilled?	Has Well Ever Been Perforated in Any Zone Other Than the Proposed Injection Zone?
No	Geothermal experimental production	No

List All Such Perforated Intervals and Sacks of Cement used to Seal Off or Squeeze Each

Depth of Bottom of Deepest Fresh Water Zone in This Area	Is This Injection for Purpose of Pressure Maintenance or Water Disposal? (See Rules 501 and 502)
400'	Water disposal

Anticipated Daily Injection Volume	Minimum	Maximum	Open or Closed Type System	Is Injection to be by Gravity or Pressure?	Approx. Pressure (psi)
75,000 gal	54,000 gal	81,000 gal	open	pressure	3,000

Answer Yes or No Whether the Following Waters are Mineralized to such a Degree as to be Unfit for Domestic, Stock, Irrigation, or Other General Use—	Water to be Injected	Natural Water in Injection Zone	Are Water Analyses Attached?
	yes	N/A	yes

Name and Address of Surface Owner (or Lessee, if State or Federal Land)

U.S. Forest Service

List Names and Addresses of all Operators Within One-Half (½) Mile of This Injection Well

None

Have Copies of this Application Been Sent to Each Operator Within One-Half Mile of this Well?	Yes ☐ No ☐ N/A

Are the Following Items Attached to this Application (see Rule 503)	Plat of Area	Electrical Log	Diagrammatic Sketch of Well
	Yes ☐ No ☒	Yes ☐ No ☒	Yes ☒ No ☐

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

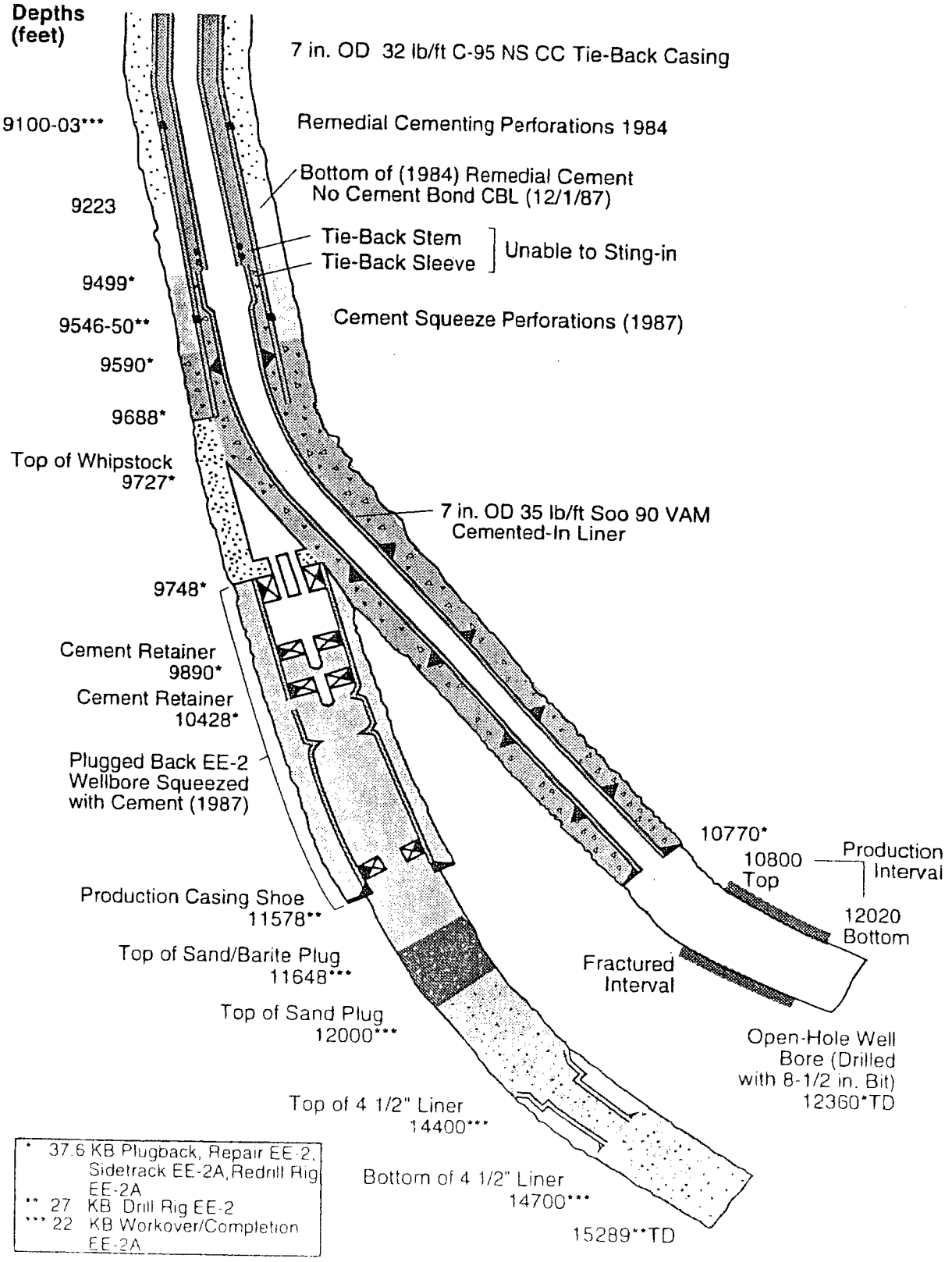
D. Gary Pearson — (Signature)

Acting Division Leader — (Title)

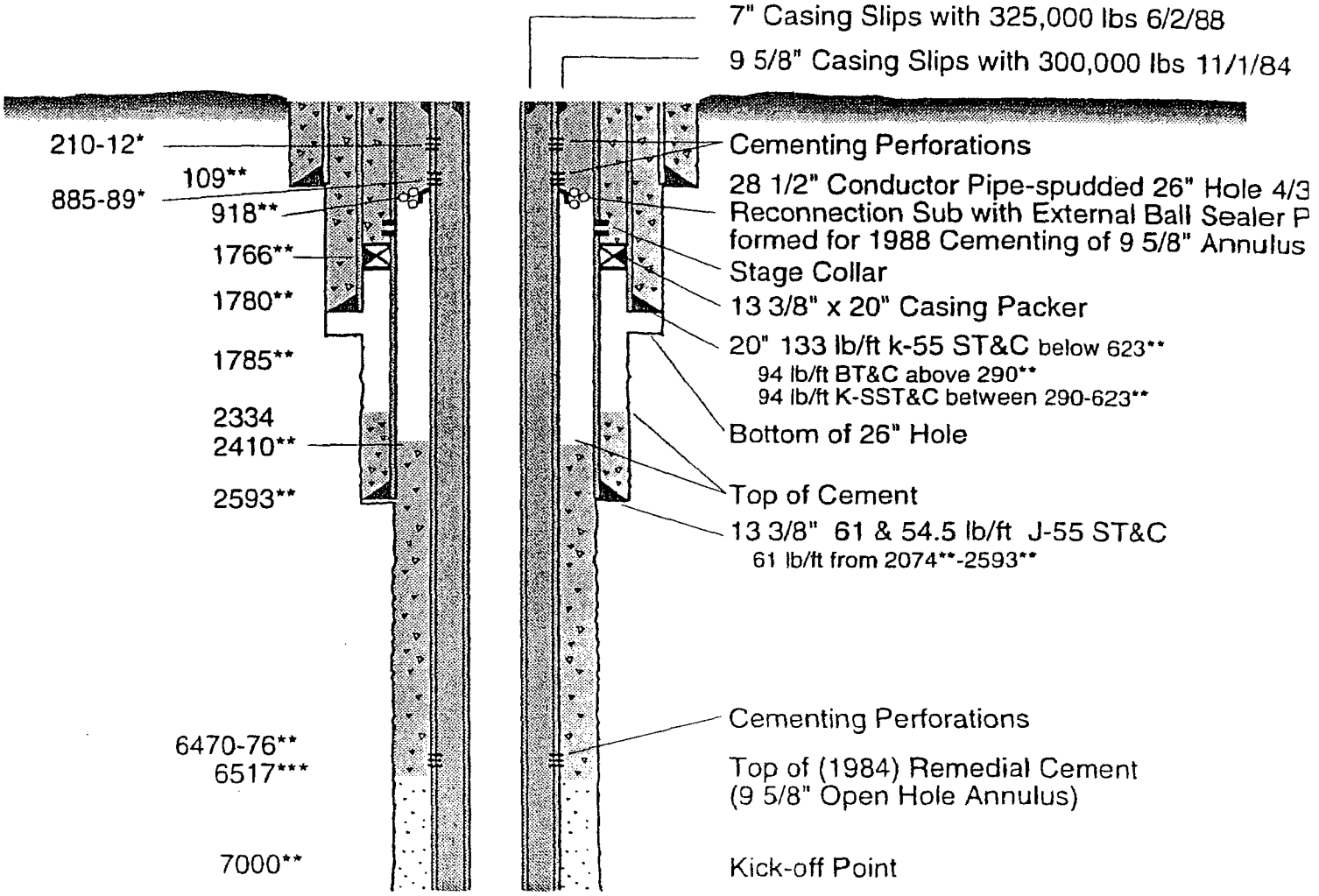
6/24/02 — (Date)

NOTE: Should waivers from all operators within one-half mile of the proposed injection well not accompany this application, the New Mexico Oil Conservation Division will hold the application for a period of 20 days from the date of receipt by the Division's Santa Fe office. If at the end of the 20-day waiting period no protest has been received by the Santa Fe office, the application will be processed. If a protest is received, the application will be set for hearing. If the applicant so requests. SEE RULE 503.

Present Configuration of EE-2A. Completed June 17, 1988
(Drawing revised 7/15/91, all depths in ft)



Present Configuration of EE 2-A
As completed June 17, 1988
(Drawing revised 7/15/91, all depths in ft)



* 37.6 KB Plugback, Repair EE-2, Sidetrack EE-2A, Redrill Rig EE-2A
** 27 KB Drill Rig EE-2
*** 22 KB Workover/Completion EE-2A

1 Million Gallon Pond Water, Fenton Hill

Sample ID #	Sample Date			Sample Type
1MGP 041802	04/18/02			totals, nonfiltered
Analyte	**Result**	**Units**	**Std.D. (+/-)**	**TCLP Concentration Limits (40CFR 261)**
Ag	<0.01	ppm		5.0
Al	<0.02	ppm		
As	3.56	ppm	0.05	5.0
B	22.2	ppm	0.1	
Ba	1.30	ppm	0.01	100.0
Be	<0.002	ppm		
Cd	<0.01	ppm		1.0
Cl	7612	ppm		
Co	<0.01	ppm		
Cr	<0.01	ppm		5.0
Cu	<0.01	ppm		
F	1.26	ppm		
Fe	0.03	ppm	0.01	
Hg	0.0003	ppm		0.2
Li	10.7	ppm	0.1	
Mg	134	ppm	1	
Mn	0.039	ppm	0.001	
Mo	0.02	ppm	0.01	
Na	3220	ppm	5	
Ni	<0.01	ppm		
Pb	<0.01	ppm		5.0
pH	7.91	su		
Se	<0.0002	ppm		1.0
Sb	<0.1	ppm		
SO4	179	ppm		
Sr	5.08	ppm	0.01	
Ti	<0.002	ppm		
V	<0.002	ppm		
Zn	<0.01	ppm		

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: January 11, 2001
In Reply Refer To: ESH-18/WQ&H:00-0426
Mail Stop: K497
Telephone: (505) 665-1859

Ms. Lori Wrotenbery, Director
Oil Conservation Division
New Mexico Energy, Minerals, and Natural Resources Department
2040 South Pacheco Street
Santa Fe, New Mexico 87505

SUBJECT: GROUND WATER DISCHARGE PLAN (GW-031) ANNUAL REPORT FOR THE FENTON HILL GEOTHERMAL FACILITY, 2000

Dear Ms. Wrotenbery:

This letter is being submitted as Los Alamos National Laboratory's Ground Water Discharge Plan (GW-031) Annual Report for the Fenton Hill Geothermal Facility for CY2000.

The following is a summary of the relevant information for 2000.

1. No water was injected into EE-2A in 2000 (It should be noted that EE-2A is the only remaining geothermal well. All other geothermal wells were plugged and abandoned in 1996).
2. No plugging and abandonment (P&A) activities were conducted during 2000.
3. No decommissioning (D&D) activities were conducted during 2000.
4. No wastewater was land applied or discharged to the environment during 2000.

Please call me at (505) 667-7969 if you have any questions concerning this report.

Sincerely,

Bob Beers
Water Quality and Hydrology Group

RB/tml

Cy: M. Khattibi, Pueblo of Jemez, Jemez Springs, New Mexico
J. Peterson, District Ranger, Jemez Ranger District, Jemez Springs, New Mexico
J. Parker, NMED/DOE/OB, Santa Fe, New Mexico
J. Vozella, DOE/LAAO, MS A316
M. Johansen, DOE/LAAO, MS A316
T. Gunderson, DLDOPS, MS A100
B. Grimes, CRO-1, MS A117
J. Albright, EES-4, MS D443
J. Thomson, EES-4, MS D443
D. Erickson, ESH-DO, MS K491
L. McAtee, ESH-DO, MS K491
S. Rae, ESH-18, MS K497
M. Saladen, ESH-18, MS K497
D. Thomas, P-FM, MS D459
G. Sinnis, P-23, H803
WQ&H File, MS K497
IM-5, MS A150

ACKNOWLEDGEMENT OF RECEIPT OF CHECK/CASH

I hereby acknowledge receipt of check No. 923796 dated 10/26/00

or cash received on _____ in the amount of $ 690.00

from LOS ALAMOS NATIONAL LABORATORY

for FENTON HILL GEOTHERMAL GW-031-
(Facility Name) (DP No.)

Submitted by: WAYNE PRICE Date: 11/2/00

Submitted to ASD by: [signature] Date: 11/2/00

Received in ASD by: _____ Date: _____

Filing Fee ___ New Facility ___ Renewal ✓

Modification ___ Other _____
(specify)

Organization Code 521.07 Applicable FY 2001

To be deposited in the Water Quality Management Fund.

Full Payment ✓ or Annual Increment ___

THE FACE OF THIS CHECK IS PRINTED BLUE - THE BACK CONTAINS A SIMULATED WATERMARK

CHECK NO. 923796

LOS ALAMOS NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA
PO Box 1663, MS P240
Los Alamos, NM 87545

923796

95-101
1070

Pay Six hundred ninety and 00/100 Dollars

MO	DAY	YR
10/26/00		

*******$690.00

To The Order Of NMED WATER QUALITY MGMT
2040 S PACHECO
SANTA FE NM 87505

PLEASE CASH PROMPTLY
SUBJECT TO CANCELLATION
NINETY (90) DAYS AFTER DATE

Los Alamos National Bank
Los Alamos, NM 87544

AUTHORIZED SIGNATURE

⑈923796⑈ ⑆107001012⑆ 00 685259⑈01

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
Jennifer A. Salisbury
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

November 2, 2000

CERTIFIED MAIL
RETURN RECEIPT 5051 4720

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

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

Dear Mr. Rae:

The New Mexico Oil Conservation Division (OCD) is in receipt of your letter Dated October 31, 2000 requesting closure of the two land application units on-site. The NMOCD hereby approves of your request and requires no further action at this time.

Please be advised that NMOCD approval of this closure does not relieve Los Alamos National Laboratory of responsibility should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve Los Alamos National Laboratory of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Sincerely;

Wayne Price-Pet. Engr. Spec.

cc: OCD Aztec Office

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

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

Lori Wrotenbery
Director
Oil Conservation Division

Memorandum of Meeting or Conversation

Telephone ____
Personal __X____
E-Mail _____

Time: 3pm
Date: OCT 13,2000

Originating Party: **Bob Bears-DOE LANL**

Other Parties: **Roger Anderson, Wayne Price-OCD**

Subject: **DP**

Discussion: **Requested exemption to netting since water is non-hazardous to wildlife.**

Conclusions or Agreements:

Granted by Roger Anderson. Re-wrote DP without Netting requirement.

Signed: _____

CC:

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: August 16, 2000
In Reply Refer To: ESH-18/WQ&H:00-0261
Mail Stop: K497
Telephone: (505) 665-1859

AUG 2 1

Mr. Roger C. Anderson
Environmental Bureau Chief
Oil Conservation Division
New Mexico Energy, Minerals
& Natural Resources Department
2040 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:

Los Alamos National Laboratory is in receipt of your May 8, 2000, letter and attachments conditionally approving the Groundwater Discharge Plan GW-031 for the Fenton Hill Geothermal Facility.

In your letter you requested additional information within ten working days. As you know from discussions with Bob Beers of the Laboratory's Water Quality and Hydrology Group, the Laboratory was closed due to the Cerro Grande Wildfire from May 8th until May 22nd, 2000. Since the reopening of the Laboratory, the Water Quality and Hydrology Group has dedicated its resources almost exclusively to fire related work and has not been able to complete the requirements of your letter. Please accept our apologies for the delay in responding to your May 8th letter.

In reference to your letter, the Laboratory is requesting an extension of the July 1, 2000, deadline for submitting an approved storm water plan and operating/closure plans for the two land application units at Fenton Hill until October 31, 2000. As indicated above, the Cerro Grande Wildfire has severely delayed the completion of pre-fire work and the Laboratory has not been able to dedicate the resources necessary to complete the storm water plan and the operating/closure plans.

Also, the Laboratory is requesting an exception to your agency's requirement for netting or screening of the one million-gallon pond at Fenton Hill. In the letter referenced above, the third paragraph of page one details an Oil Conservation Division requirement that all exposed pits, including lined pits and open top tanks be screened, netted, or otherwise rendered nonhazardous to wildlife including migratory birds. As you are aware, the Fenton Hill Geothermal Facility has a one million-gallon pond that is not netted or screened. It is, however, double fenced with an 8-foot high chain link fence around the perimeter of the facility and a second, 4-foot, chain link fence around the perimeter of the pond. These fences have proven to be effective barriers in keeping large wildlife out of the pond area.

The Laboratory's request for an exception to the netting or screening requirement is based upon the nonhazardous quality of the water in the pond. Enclosed please find Table 1.0 that presents the analytical results from sampling of the one million-gallon pond in April, 2000. The quality of the one million-gallon pond water meets all New Mexico Water Quality Control Commission (NM WQCC) Livestock and Wildlife Watering Standards with the exception of arsenic and boron. The concentrations of arsenic (0.45 mg/L) and boron (11.5 mg/L) in the pond water are approximately twice the NM WQCC Standards (0.2 mg/L and 5 mg/L, respectively). The Livestock and Wildlife Watering Standards are based upon long-term consumption by livestock and wildlife whereas use of the one million-gallon pond by birds, and in particular migratory birds, would be incidental or short-term.

An alternate approach would be to compare arsenic and boron concentrations in the pond water with the ecological screening levels used in ecological risk assessments. A query of Los Alamos National Laboratory's ECORISK database produced the following:

- For a robin, the "No Effect" concentrations for arsenic and boron in water are 36 mg/L and 330 mg/L, respectively; and
- For a kestrel, the "No Effect" concentrations for arsenic and boron in water are 42 mg/L and 380 mg/L, respectively.

These data are being presented to provide some general perspective on the concentrations of arsenic and boron which could produce negative effects on birds. Arsenic and boron concentrations in the one-million gallon pond are approximately $1/100^{th}$ and $1/30^{th}$ of the "No Effect" concentrations referenced above, respectively. At the arsenic and boron concentrations presented in Table 1.0, any incidental or short-term use of the one-million gallon pond by birds would produce a total consumption well below the "No Effect" level. Therefore, we are requesting an exception to the netting or screening requirement.

Thank you for your consideration of our requests. Please call me at 665-1859 or Bob Beers at 667-7969 if additional information would be helpful.

Sincerely,

Steven R. Rae
Water Quality and Hydrology Group

SR:BB/tml

Enclosures: a/s

Cy: M. Johansen, DOE/LAAO, w/enc., MS A316
J. Albright, EES-4, w/enc., MS D443
J. Thomson, EES-4, w/enc., MS D443
D. Erickson, ESH-DO, w/enc., MS K491
M. Saladen, ESH-18, w/enc., MS K497
B. Beers, ESH-18, w/enc., MS K497
P. Wardwell, LC/GL, w/enc., MS A187
G. Sinnis, P-23, w/enc., MS H803
D. Thomas, P-FM, w/enc., MS D459
WQ&H File, w/enc., MS K497
CIC-10, w/enc., MS A150

TABLE 1.0

FENTON HILL GEOTHERMAL FACILITY
1 MG POND
WATER QUALITYDATA
SAMPLE DATE: 4/24/00

Sample Type	Al	As	B	Cd	Co	Cr	Cu	Hg	Pb	pH	Se	V	Zn
Analytical Results-Filtered (mg/L)	<0.02	0.45	11.5	0.002	<0.002	0.004	0.012	0.0002	<0.01	----	<0.0002	<0.002	0.013
Analytical Results-Nonfiltered (mg/L)	2.85	0.44	11.8	<0.01	<0.01	<0.01	<0.01	0.0002	<0.01	7.84	<0.0002	<0.002	0.01
NMWQCC Wildlife Watering Standards								*0.00077**			*5*		
NM WQCC Livestock Watering Standards	*5*	*0.2*	*5*	*0.05*	*1*	*1*	*0.5*	*0.01*	*0.1*		*0.05*	*0.1*	*25*

Notes:

This standard is below the analytical method Minimum Detection Limit (MDL)

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

May 08, 2000

CERTIFIED MAIL
RETURN RECEIPT NO. 5051 5901

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.

Please be advised that all exposed pits, including lined pits and open top tanks (exceeding 16 feet in diameter) shall be screened, netted, or otherwise rendered nonhazardous to wildlife including migratory birds.

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
May 08, 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 by July 1, 2000 for OCD approval.

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 July 1, 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**

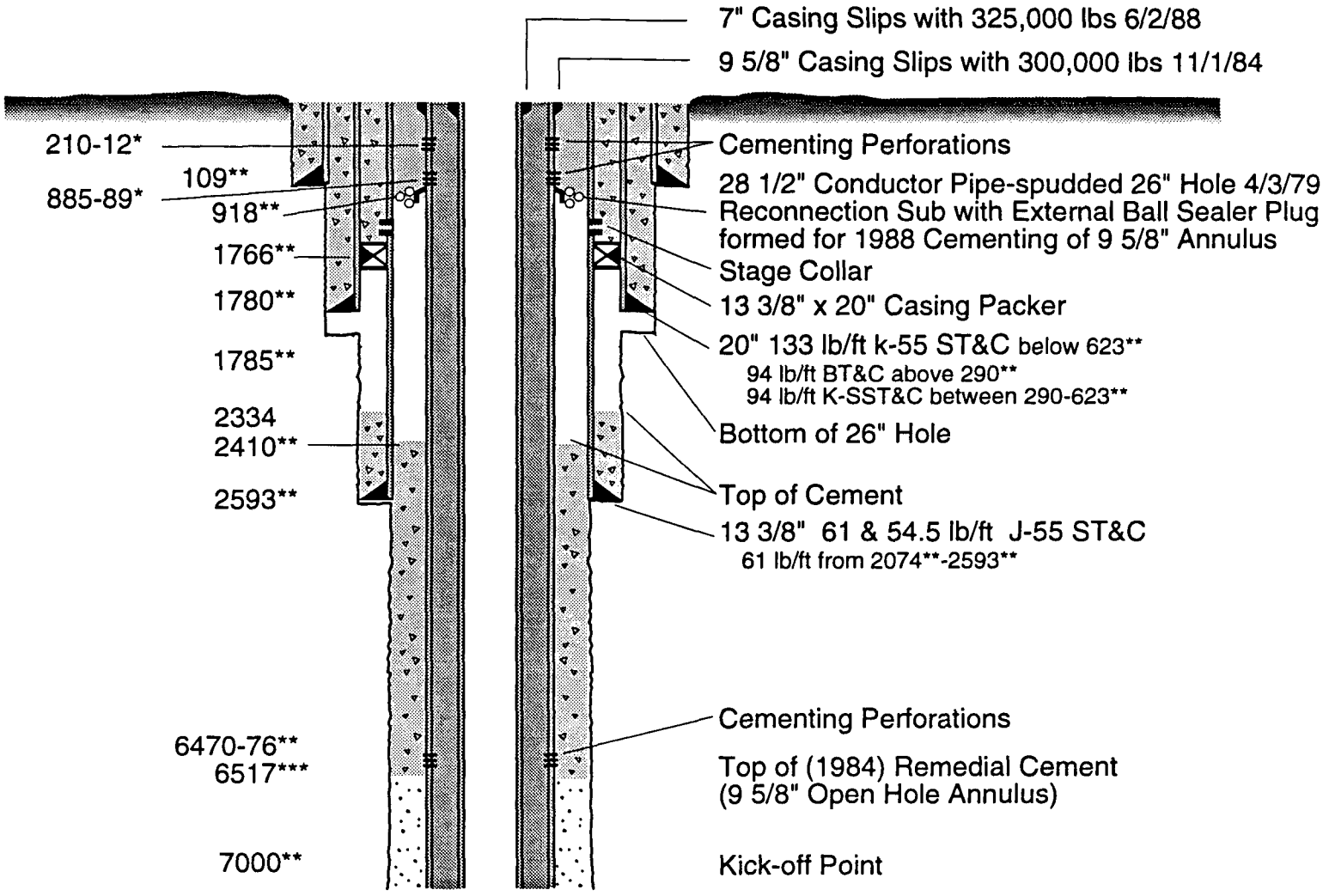
_____
Company Representative- print name

_____ Date_____
Company Representative- Sign

Title_____

Present Configuration of EE 2-A

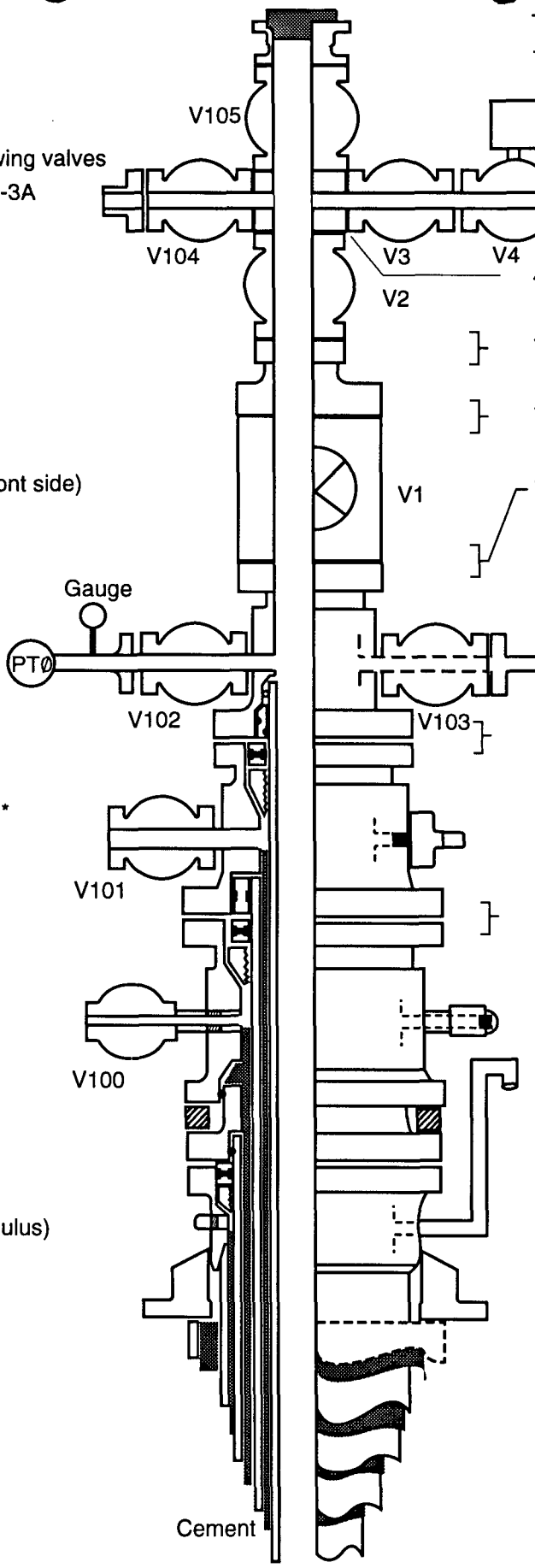
As completed June 17, 1988
(Drawing revised 7/15/91, all depths in ft)



* 37.6 KB Plugback, Repair EE-2, Sidetrack EE-2A, Redrill Rig EE-2A
** 27 KB Drill Rig EE-2
*** 22 KB Workover/Completion EE-2A

Effective 4/30/92

EE-2A Production Wellhead



Logging valve

Production cross and wing valves

Surface loop line to EE-3A (front side)

Upper master valve

Xover spool

Lower master valve (front side) (shut in for P >4500)

Side outlets (front side)

Pressure relief valve

Side outlets (backside)* cemented to surface

Side outlet (annulus)

Special design flanges

Side outlets (outer annulus) cemented to surface

Conductor pipe

Surface casing

Intermediate casing

Production Casing

Tie-back casing

30 in. OD

20 in. OD

13-3/8 in. OD

9-5/8 in. OD

7 in. OD

Open hole 10775-12360 feet

*Open valve prior to production and watch for flow throughout production and cooldown.

Effective 4/30/92

The Santa Fe New Mexican

Since 1849. We Read You.

MAR - 3 2000

OIL CONSERVATION DIVISION

NM OIL CONSERVATION DIVISION
ATTN: DONNA DOMINGUEZ
2040 S. PACHECO ST.
SANTA FE, NM 87505

AD NUMBER: 135487 ACCOUNT: 56689
LEGAL NO: 66977 P.O.#: 00199000278
162 LINES 1 time(s) at $ 71.42
AFFIDAVITS: 5.25
TAX: 4.79
TOTAL: 81.46

NOTICE OF PUBLICATION

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations, the following discharge plan application has been submitted to the Director of the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, Telephone (505) 827-7131:

(GW-31) - Los Alamos National Laboratory, Mr. Steven R. Rae, Group Leader Water Quality and Hydrology Group, MS K497 Los Alamos, New Mexico 87545, has submitted a discharge plan renewal application for Geothermal Operations at Fenton Hill experimental site located NE/4 of Section 13, Township 19 North, Range 2 East, NMPM, Sandoval County, New Mexico. The discharge plan will address how leaks, spills and solid waste from geothermal operations will be managed in order to protect ground or surface water.

Any interested person may obtain further information from the Oil Conservation Division and may submit written comments to the Director of the Oil Conservation Division at the address given above. The discharge plan application may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday. Prior to ruling on any proposed discharge plan or its modification, the Director of the Oil Conservation Division shall allow at least thirty (30) days after the date of publication of this notice during which comments may be submitted to him and a public hearing may be requested by any interested person. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed plan based on information available. If a public hearing is held, the director will approve or disapprove the proposed plan based on information in the plan and information submitted at the hearing.

GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 25th day of February, 2000.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION
LORI WROTENBERY,
Director

Legal #66977
Pub. March 2, 2000

AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO
COUNTY OF SANTA FE

I, B Perner being first duly sworn declare and say that I am Legal Advertising Representative of THE SANTA FE NEW MEXICAN, a daily newspaper published in the English language, and having a general circulation in the Counties of Santa Fe and Los Alamos, State of New Mexico and being a Newspaper duly qualified to publish legal notices and advertisements under the provisions of Chapter 167 on Session Laws of 1937; that the publication #66977 a copy of which is hereto attached was published in said newspaper 1 day(s) between 03/02/2000 and 03/02/2000 and that the notice was published in the newspaper proper and not in any supplement; the first publication being on the 2 day of March, 2000 and that the undersigned has personal knowledge of the matter and things set forth in this affidavit.

/S/ Betsy Perner
LEGAL ADVERTISEMENT REPRESENTATIVE

Subscribed and sworn to before me on this 1 day of March A.D., 2000

Notary Candace L. Duston

Commission Expires 11/16/2003

OK for payment

NOTICE OF PUBLICATION

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

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GIVEN under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this 25th day of February, 2000.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

S E A L

for LORI WROTENBERY, Director

ACKNOWLEDGEMENT OF RECEIPT OF CHECK/CASH

I hereby acknowledge receipt of check No. 894873 dated 1/27/00,

or cash received on _____ in the amount of $ 50.00

from LOS ALAMOS NATIONAL LABORATORY

for FENTON HILL - GEOTHERMAL GW-031
(Facility Name) (DP No.)

Submitted by: WAYNE PRICE Date: 2/7/00

Submitted to ASD by: _____ Date: "

Received in ASD by: _____ Date: _____

Filing Fee ✓ New Facility ___ Renewal ___

Modification ___ Other _____
(specify)

Organization Code 521.07 Applicable FY 2000

To be deposited in the Water Quality Management Fund.

Full Payment ___ or Annual Increment ___

THE FACE OF THIS CHECK IS PRINTED BLUE - THE BACK CONTAINS A SIMULATED WATERMARK

CHECK NO. 894873

LOS ALAMOS NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA
PO Box 1663, MS P240
Los Alamos, NM 87545

894873

95-101
1070

Pay Fifty and 00/100 Dollars

MO	DAY	YR
01/27/00		

To The Order Of
STATE OF NEW MEXICO
ENERGY MIN & NAT RES DEPT
OIL CONSERV DIV/2040 S PACHECO
SANTA FE NM 87505

*******$50.00

PLEASE CASH PROMPTLY
SUBJECT TO CANCELLATION
NINETY (90) DAYS AFTER DATE

Los Alamos National Bank
Los Alamos, NM 87544

Allan Flohrs
AUTHORIZED SIGNATURE

⑈894873⑈ ⑆107001012⑆ 00 685259⑈01

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: February 2, 2000
In Reply Refer To: ESH-18/WQ&H:00-0034
Mail Stop: K497
Telephone: (505) 665-1859

Ms. Lori Wrotenbery, Director
Oil Conservation Division
New Mexico Energy, Minerals, and Natural Resources Department
2040 South Pacheco Street
Santa Fe, New Mexico 87505

SUBJECT: REQUEST FOR RENEWAL, LOS ALAMOS NATIONAL LABORATORY, GROUND WATER DISCHARGE PLAN (GW-031) FOR GEOTHERMAL OPERATIONS AT FENTON HILL

Dear Ms. Wrotenbery:

Enclosed please find Los Alamos National Laboratory's application for renewal of the Ground Water Discharge Plan (GW-031) for Geothermal Operations at Fenton Hill, Sandoval County, New Mexico. Also enclosed, please find the $50 filing fee required by regulation. We are requesting an extension of the existing discharge plan for an additional five-year period (2000-2005) in order to continue experimental work at the Fenton Hill site. As indicated in the renewal application, no major operational changes are anticipated during the renewal period (2000-2005).

Please contact Bob Beers of my staff at 667-7969 if you have any questions concerning this submittal.

Sincerely,

Steven R. Rae
Group Leader
Water Quality and Hydrology Group

SR:RB/rm

Enclosures: a/s

Cy: D. Duffy, Pueblo of Jemez, Jemez Springs, New Mexico, w/enc.
G. Suazo, CRO-1, w/enc., MS A117
J. Peterson, District Ranger, Jemez Ranger District, Jemez Springs, New Mexico, w/enc.
J. Parker, NMED-DOE/OB, Santa Fe, New Mexico, w/enc.
J. Vozella, DOE/LAAO, w/enc., MS A316
M. Johansen, DOE/LAAO, w/enc., MS A316
T. Gunderson, DLDOPS, w/enc., MS A100

Cy (continued):
D. Erickson, ESH-DO, w/enc., MS K491
B. Beers, ESH-18, w/enc., MS K497
M. Saladen, ESH-18, w/enc., MS K497
D. Thomas, P-FM, w/enc., MS D446
J. Albright, EES-4, w/enc., MS D443
J. Thomson, EES-4, w/enc., MS D433
G. Sinnis, P-23, w/enc., MS H803
WQ&H File, w/enc., MS K497
CIC-10, w/enc., MS A150

APPLICATION FOR RENEWAL
DISCHARGE PLAN (GW-031) FOR GEOTHERMAL OPERATIONS AT FENTON HILL

I. General Information

A. Name, Address, and Telephone Number for Discharger or Legally Responsible Party:

Mr. David Gurule, Area Manager
U.S. Department of Energy
Los Alamos Area Office
528 35th Street
Los Alamos, New Mexico 87544
(505) 667-5105

Dennis J. Erickson, Director
Environment, Safety and Health Division
Los Alamos National Laboratory
P.O. Box 1663 MS K491
Los Alamos, New Mexico 87545
(505) 667-4218

B. Location of Discharge: 1/4 NE Section 13, Township 19 North, Range 2 East, NMPM.

The Fenton Hill Project site is located in the Jemez Mountains in Sandoval County of north central New Mexico. It is about 35 miles west of Los Alamos and 10 miles north of Jemez Springs.

C. Type of Operation: Geothermal.

The Los Alamos Hot Dry Rock (HDR) Geothermal Energy Development Project, sponsored by the U.S. Department of Energy (DOE), is a research program to develop the technology necessary to economically extract the energy contained at accessible depths within the earth's crust. The HDR Project has been conducting research activities at the Fenton Hill Project site since 1972. During the past renewal period (1995-2000), the HDR Project experienced a substantial reduction in funding resulting in a termination of project activities and a partial decommissioning of the facility. Below is a list of the significant programmatic changes that occurred during the past renewal period (1995-2000):

1. In 1995, a new astrophysical observatory was constructed in and around the existing 5.7 million-gallon reservoir at the Fenton Hill Project site (Notice of Changed Conditions, Mr. Larry D. Kirkman, U.S. Department of Energy, to Mr. William J. LeMay, N.M. OCD, December, 1995). The observatory, called Milagro, is collaboration between Los Alamos National Laboratory and a number of academic institutions. Using more than 700 light sensitive detectors submerged in the 5.7 million-gallon reservoir, plus another 200 detectors arrayed around the reservoir, the observatory will record signals from high-energy cosmic emissions.
   Once the Milagro Project began using the 5.7 million-gallon reservoir for astrophysical research, the reservoir was no longer available to the HDR Project for geothermal operations. As a result, since 1995 all discharges from the venting of geothermal wells have been made exclusively to the 1.0 million-gallon service pond.

2. In 1996, all geothermal wells, with the exception of EE-2A, were plugged and abandoned. As required under New Mexico Oil Conservation Division (OCD) Rule G-203B, Form G-103 (Sundry Notice and Report) was filed with OCD for each of the six (6) geothermal wells plugged and abandoned at the Fenton Hill Project site (Mr. Mathew P. Johansen, U.S. Department of Energy, to Mr. Roy Johnson, N.M. OCD, February 4, 1997, LAAMEP:3MJ-005).

C. Type of Operation: Geothermal. **(Con't)**

3. On April 6, 1998, N.M. OCD was notified of the Laboratory's intent to conduct micro-borehole drilling experiments at the Fenton Hill Project site (Mr. Bob Beers, Los Alamos National Laboratory, to Mr. Mark Ashley, N.M. OCD, April 6, 1998, ESH-18/WQ&H:98-0118).

4. On July 20, 1998, the Laboratory submitted a Minor Modification to Ground Water Discharge Plan GW-031 for the following operational changes at the Fenton Hill Project site (Mr. Steven R. Rae, Los Alamos National Laboratory, to Mr. Roger C. Anderson, N.M. OCD, July 20, 1998, ESH-18/WQ&H:98-0232):

    a. The installation of an enhanced evaporation system for the 1.0 million-gallon service pond;

    b. The discontinuation of NPDES Permit No. NM0028576, as approved by the U.S. Environmental Protection Agency on December 29, 1997 (Mr. Jack V. Ferguson, EPA Region 6, to Mr. G. Thomas Todd, U.S. Department of Energy, December 29, 1997, 6WQ-CA); and

    c. The mixing of exempt and nonexempt wastes in the 1 million-gallon service pond in accordance with N.M. OCD mixture policy.

    The N.M. OCD approved the Laboratory's Minor Modification request on May 10, 1999 (Mr. Roger C. Anderson, N.M. OCD, to Mr. Steven Rae, Los Alamos National Laboratory, May 10, 1999, Certified Mail Receipt No. Z559573595). Approval was contingent upon the successful completion of a Mechanical Integrity Test (MIT) of the 8 inch buried cast iron pipe used to convey wastewater from the Milagro Project's water treatment units to the HDR Project's 1.0 million-gallon pond. On June 1, 1999, the Laboratory successfully completed the required MIT. The test results were forward to the N.M. OCD on June 7, 1999 (Mr. Steven Rae, Los Alamos National Laboratory, to Mr. Roger Anderson, N.M. OCD, June 7, 1999, ESH-18/WQ&H:99-0209).

D. Affirmation:

"I hereby certify that I am familiar with the information contained in and submitted with this application for renewal and that such information is true, accurate and complete to the best of my knowledge and belief."

(Signature)

Steven Rae, Group Leader
Water Quality & Hydrology Group
Los Alamos National Laboratory

II. PLANT PROCESS

A. Describe storage and uses of geothermal waters and any surface disposal impoundments.

Neither the Hot Dry Rock (HDR) Project nor the Milagro Project, both sited at the Fenton Hill Project site, uses geothermal water. The Fenton Hill Project site has two impoundments, the 5.7 million-gallon reservoir used by the Milagro Project, and the 1.0 million-gallon service pond used by the HDR Project. Only the 1.0 million-gallon service pond functions as a disposal impoundment, receiving vented water from geothermal well EE-2A and wastewater from the Milagro Project's water treatment units. The 5.7 million-gallon reservoir was relined in 1996 in accordance with the liner specifications provided in the Laboratory's Notice of Changed Conditions, submitted in December, 1995 (Mr. Larry D. Kirkman, U.S. Department of Energy, to Mr. William J. LeMay, N.M. OCD, December, 1995). The 1.0 million-gallon service pond has been lined in accordance with the plan and specifications approved by the Oil Conservation Division, April 4, 1990 (Mr. Roger C. Anderson, N.M. OCD, to Mr. Jack B. Tillman, U.S. Department of Energy, April 4, 1990, Certified Mail Receipt No. P918402152).

B. Estimated quantities used in gallons per day (gpd).

No geothermal water is used at the Fenton Hill Project site. All water used at the site is from the facility's domestic water supply well. It is estimated that the Milagro Project will use approximately 200,000 gallons per year of domestic water for routine operations. Water usage could be as high as 6 million gallons per year in the event that it is necessary for the Milagro Project to drain the 5.7 million-gallon reservoir and refill. Draining and refilling of the 5.7 million-gallon reservoir is not expected to occur during the next renewal period (2000-2005) except as a result of a catastrophic event.

The HDR Project is not expected to use any domestic water during the next renewal period (2000-2005).

C. Any additives or commingling.

No chemical additives are used at by the HDR or Milagro Projects. No commingling of geothermal and potable water supplies occurs at the Fenton Hill Project site.

III. SITE CHARACTERISTICS

A. Provide the name, description, and location of any ground water discharge sites (water wells, seeps, springs, watercourses) within one mile of the outside perimeter of the facility. For water wells, specify use of water (e.g., irrigation, domestic, etc.)

This information was provided in the original Ground Water Discharge Plan Application submitted to the N.M. OCD in 1984 and has not changed.

B. If known, provide the flow direction of the groundwater most likely to be affected by the discharge. Include the source of the information and how it was determined.

This information was provided in Appendix C of the original Ground Water Discharge Plan Application submitted to the N.M. OCD in 1984 and has not changed.

C. Provide depth to water of geothermal water, and if possible, any fresh water wells that could be affected by any discharge.

HDR Project has never used geothermal water. Water in the domestic/experimental water well is tapped at approximately 377 feet.

D. Depth to and lithologic description of rock at base of alluvium. Provide drillers logs and geologic information and maps as available.

This information was provided in the original Ground Water Discharge Plan Application submitted to the N.M. OCD in 1984 and has not changed.

E. Describe flooding potential of the discharge site.

No flooding danger exists because the Project site is located above nearby streams on top of a narrow (1/2 mile wide) ridge; local runoff is diverted from the developed site.

F. Any additional information that may be necessary to demonstrate that approval of the renewal of the Discharge Plan will not result in concentrations in excess of the standards of WQCC Regulations, Section 3-103, or the presence of any toxic pollutant at any place of withdrawal of water for present or reasonably foreseeable future use. Detailed information on site geologic and hydrologic conditions may be required for a technical evaluation of the applicant's proposed Discharge Plan.

HDR Project

As a result of the 1996 plugging and abandonment of all HDR Project geothermal wells with the exception of EE-2A, the HDR Project no longer has the capability of conducting geothermal research and experimentation. The Phase II Hot Dry Rock reservoir is still pressurized to a minimal extent (approximately 160 psi) and, as a result, some venting of the reservoir through well EE-2A may be required in the future. Any vented fluid would be stored in the 1.0 million-gallon pond and will ultimately be evaporated or reinjected into EE-2A. An injection permit will be obtained from OCD before any injection activities are conducted.

During the next renewal period it expected that HDR Project research activities will be limited to the following: (1) The testing of down-hole logging tools in well EE-2A, and (2) Experimental drilling using micro-borehole equipment. All micro-borehole drill depths will be limited to 350 feet to ensure that the fresh water aquifer is not penetrated. In addition, all drilling fluids will be contained on-site in the HDR Project's 1.0 million-gallon pond.

Milagro Project

Due to the nature of the astrophysical research conducted by the Milagro Project, it is necessary for the water in the 5.7 million-gallon reservoir to be ultra-pure. Purification is achieved through treatment by softening (ion exchange), filtration (multimedia and carbon filters), and disinfection (UV). Wastewater generated during the regeneration/backwashing of these treatment units is discharged to the HDR Project's 1.0 million-gallon pond for evaporation.

Milagro Project (con't)

During the past renewal period (1995-2000) it was necessary for the Milagro Project to drain the contents of the 5.7 million-gallon reservoir to service the submerged light sensitive detectors. In May 1998, approximately 2.5 million gallons of purified water was land applied to forestland at Fenton Hill. Land application was conducted in accordance with the terms and conditions of N.M. OCD's approval of the Laboratory's Notice of Intent to Discharge (Revised Notice of Intent to Discharge, Mr. Steven Rae, Los Alamos National Laboratory, to Mr. Roger Anderson, N.M. OCD, April 16, 1998, ESH-18/WQ&H:98-0127). If it is necessary during the next renewal period (2000-2005) for the Milagro Project to drain the 5.7 million-gallon reservoir then the Laboratory will submit a new NOI to your agency for land application of the ultra-pure water.

Over the next two years the Milagro Project will install approximately 170 500-gallon above ground polypropylene tanks. Each of these tanks will be filled with ultra-pure water from the 5.7 million-gallon reservoir. The tanks will serve to expand the array of light sensitive detectors beyond the boundaries of the existing 5.7 million-gallon reservoir.

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: January 11, 2000
In Reply Refer To: ESH-18/WQ&H:00-0008
Mail Stop: K497
Telephone: (505) 665-1859

Ms. Lori Wrotenbery, Director
Oil Conservation Division
New Mexico Energy, Minerals, and Natural Resources Department
2040 South Pacheco Street
Santa Fe, New Mexico 87505

SUBJECT: GROUND WATER DISCHARGE PLAN (GW-031) ANNUAL REPORT FOR THE FENTON HILL GEOTHERMAL FACILITY, 1999

Dear Ms. Wrotenbery:

This letter is being submitted as Los Alamos National Laboratory's Ground Water Discharge Plan (GW-031) Annual Report for the Fenton Hill Geothermal Facility for CY1999.

The following is a summary of the relevant information for 1999.

1. No water was injected into EE-2 in 1999 (It should be noted that EE-2 is the only remaining geothermal well. All other geothermal wells were plugged and abandoned in 1996).
2. No plugging and abandonment (P&A) activities were conducted during 1999.
3. No decommissioning (D&D) activities were conducted during 1999.

Please call Bob Beers of my staff at (505) 667-7969 if you have any questions concerning this report.

Sincerely,

Steven R. Rae
Group Leader
Water Quality and Hydrology Group

SR:RB/rm

Cy: D. Duffy, Pueblo of Jemez, Jemez Springs, New Mexico
G. Suazo, CRO-1, MS A117
J. Peterson, District Ranger, Jemez Ranger District, Jemez Springs, New Mexico
J. Vozella, DOE/LAAO, MS A316
M. Johansen, DOE/LAAO, MS A316
J. Parker, NMED-DOE/OB, Santa Fe, New Mexico
T. Gunderson, DLDOPS, MS A100
D. Erickson, ESH-DO, MS K491
B. Beers, ESH-18, MS K497
M. Saladen, ESH-18, MS K497
D. Thomas, P-FM, MS D459
J. Albright, EES-4, MS D443
J. Thomson, EES-4, MS D443
WQ&H File, MS K497
CIC-10, MS A150

Los Alamos
NATIONAL LABORATORY

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

Date: October 5, 1999
In Reply Refer To: ESH-18/WQ&H:99-0395
Mail Stop: K497
Telephone: (505) 667-7969

Mr. Roger C. Anderson
Environmental Bureau Chief
Oil Conservation Division
New Mexico Energy, Minerals & Natural Resources Department
2040 South Pacheco Street
Santa Fe, New Mexico 87505

SUBJECT: MILAGRO PROJECT LAND APPLICATION SITE, POST-APPLICATION SOIL SAMPLING FOR 1999

Dear Mr. Anderson:

On April 10, 1995, your Division conditionally approved Los Alamos National Laboratory's Notice of Intent to Discharge (NOI) for the land application of water from the Milagro Project's five - million-gallon pond at Fenton Hill. Approval of the NOI was conditioned upon the Laboratory collecting down-gradient soil samples annually for five years following land application activities. The Laboratory has conducted five rounds of soil sampling at the Fenton Hill land application site and down-gradient locations during the following years: (1) 1995, (2) 1996, (3) 1997, (4) 1998, and (5) 1999.

On November 26, 1998, the Laboratory requested a waiver from future sampling for the eleven metals (Ag, Ba, Be, Cd, Cr, Ni, Pb, Sb, Se, Tl, and Hg) which post-application monitoring demonstrated were not contaminants of concern. Arsenic, however, was excluded from the waiver list due to its presence at concentrations greater than background. On April 23, 1998, your Division approved the Laboratory's waiver request. As a result, the post-application samples collected in 1999 was analyzed for arsenic only (See the enclosed map).

Enclosed please find a copy of the analytical report for post-application sampling in 1999. In addition, I have enclosed a table (Table 1.0) which summarizes all analytical results for arsenic since 1995. In 1999, all of the down-gradient surface and sub-surface sampling locations (SS-1, SBS-1, SS-2, SBS-2, SS-3, and SBS-3) continued to show arsenic concentrations equivalent to pre-application or background conditions (See map and Table 1.0). These stable arsenic concentrations indicate that the arsenic is remaining within the application site and is not migrating down-gradient into the watercourse.

In 1999, SS-5, a surface sampling location within the application site, showed a reduction in arsenic concentrations from the 1998 results. SS-4, the other surface sampling location within the application site, showed a slight increase over the 1998 concentration but was below the 1997 concentration. The sub-surface sampling locations within the application site (SBS-4, SBS-5) did not show any change from the four previous sampling rounds.

The enclosed sample results represent the fifth and final round of monitoring required under the 1995 NOI and completes the Laboratory's current commitment. No additional monitoring at the Fenton Hill land application site is planned by the Laboratory under the 1995 NOI.

If you have any questions regarding the enclosed analytical results, please contact me at 667-7969.

Sincerely,

Bob Beers
Water Quality and Hydrology Group

BB/rm

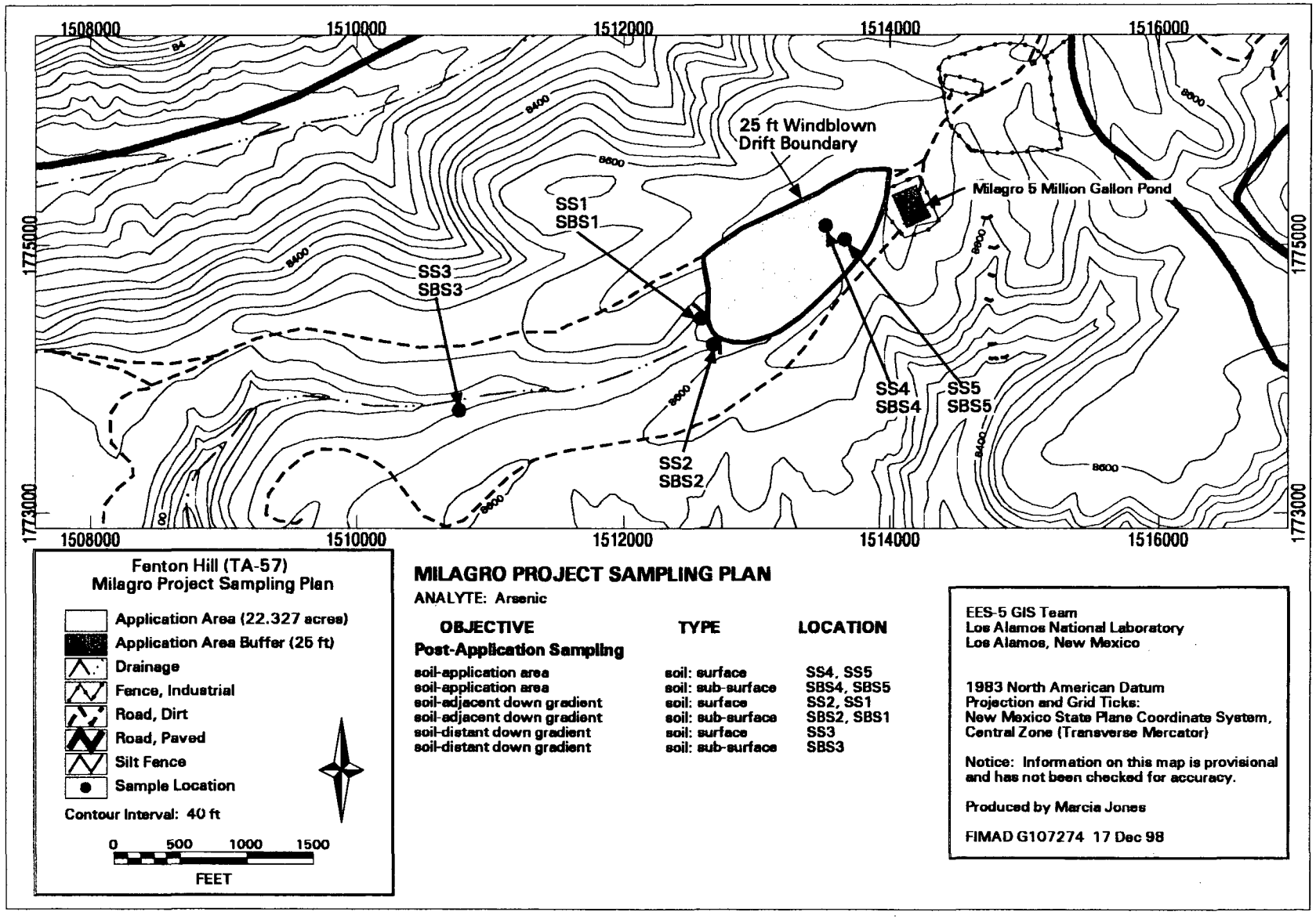
Enclosures: a/s

Cy: D. Duffy, Pueblo of Jemez, Jemez, New Mexico, w/enc.
J. Peterson, District Ranger, Santa Fe National Forest, Jemez Springs, New Mexico, w/enc.
J. Davis, NMED SWQB, Santa Fe, New Mexico, w/enc.
J. Bearzi, NMED HRMB, Santa Fe, New Mexico, w/enc.
T. Gunderson, DLD-OPS, w/enc., MS A100
D. Erickson, ESH-DO, w/enc., MS K491
S. Rae, ESH-18, w/enc., MS K497
M. Saladen, ESH-18, w/enc., MS K497
R. Enz, DOE/LAAO, w/enc., MS A316
D. Thomas, P-FM, w/enc., MS D459
C. Hoffman, P-23, w/enc., MS H803
G. Sinnis, P-23, w/enc., MS H803
WQ&H File, w/enc., MS K497
CIC-10, w/enc., MS A150

Pre- and Post-Land Application Monitoring
Arsenic Concentrations in Soil (ppm)

Sample Location	Pre-Application 5/17/95	Post-Application 10/24/95	Post-Application 10/18/96	Post-Application 10/09/97	Application 10/14/98	Application 09/14/99
SS-1: soil, surface	3.	3.	<3.	<3.	<3.0	<3.0
SBS-1: soil, sub-surface	1.	2.	<3.	<3.	<3.0	<3.0
SS-2: soil, surface	3.	3.	<3.	<3.	<3.0	<3.0
SBS-2: soil, sub-surface	2.	3.	<3.	<3.	<3.0	<3.0
SS-3: soil, surface	2.	3.	<3.	<3.	<3.0	<3.0
SBS-3: soil, sub-surface	2.	4.	<3.	<3.	<3.0	<3.0
SS-4: soil, surface	3.	24.	3.9	8.6	3.4	4.2
SBS-4: soil, sub-surface	4.	4.	<3.	<3.	<3.0	<3.0
SS-5: soil, surface	2.	18.	<3.	10.7*	4.3	<3.0
SBS-5: soil, sub-surface	2.	3.	<3.	<3.	<3.0	<3.0

* A duplicate sample at this location showed an arsenic concentration of 8.7 ppm.



Fenton Hill (TA-57)
Milagro Project Sampling Plan

- Application Area (22.327 acres)
- Application Area Buffer (25 ft)
- Drainage
- Fence, Industrial
- Road, Dirt
- Road, Paved
- Silt Fence
- Sample Location

Contour Interval: 40 ft

0 500 1000 1500
FEET

MILAGRO PROJECT SAMPLING PLAN

ANALYTE: Arsenic

OBJECTIVE	TYPE	LOCATION
Post-Application Sampling		
soil-application area	soil: surface	SS4, SS5
soil-application area	soil: sub-surface	SBS4, SBS5
soil-adjacent down gradient	soil: surface	SS2, SS1
soil-adjacent down gradient	soil: sub-surface	SBS2, SBS1
soil-distant down gradient	soil: surface	SS3
soil-distant down gradient	soil: sub-surface	SBS3

EES-5 GIS Team
Los Alamos National Laboratory
Los Alamos, New Mexico

1983 North American Datum
Projection and Grid Ticks:
New Mexico State Plane Coordinate System,
Central Zone (Transverse Mercator)

Notice: Information on this map is provisional and has not been checked for accuracy.

Produced by Marcia Jones

FIMAD G107274 17 Dec 98

ASSAIGAI
ANALYTICAL
LABORATORIES, INC.
7300 Jefferson, NE • Albuquerque, New Mexico 87109 • (505) 345-8964 • FAX (505) 345-7259
3332 Wedgewood Dr., Suite N • El Paso, Texas 79925 • (915) 593-6000 • FAX (915) 593-7820
127 Eastgate Drive, 212-C • Los Alamos, New Mexico 87544 • (505) 662-2558

Explanation of codes

B	*analyte detected in Method Blank*
E	*result is estimated*
H	*analyzed out of hold time*
N	*tentatively identified compound*
S	*subcontracted*
1-9	*see footnote*

LOS ALAMOS NATIONAL LABS
attn: **BOB BEERS**
PO BOX 1663-MSK497
LOS ALAMOS, NM 87545

Assaigai Analytical Laboratories, Inc.

Certificate of Analysis

Client: **LOS ALAMOS NATIONAL LABS**
Project: **9909184 MILAGRO APP 8K23E30300030000**

William P. Biava: President of Assaigai Analytical Laboratories, Inc.

Client Sample ID: ***SS-5.99*** Sample Matrix: ***SOIL*** Sample Collected: ***09/14/99 11:30:00***

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
9909184-01A		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-40	7440-38-2	Arsenic	ND	mg / Kg	1	3		09/23/99

Client Sample ID: ***SBS-5.99*** Sample Matrix: ***SOIL*** Sample Collected: ***09/14/99 11:30:00***

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
9909184-02A		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-43	7440-38-2	Arsenic	ND	mg / Kg	1	3		09/23/99

Client Sample ID: ***SS-4.99*** Sample Matrix: ***SOIL*** Sample Collected: ***09/14/99 11:50:00***

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
9909184-03A		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-44	7440-38-2	Arsenic	4.2	mg / Kg	1	3		09/23/99

Certificate of Analysis

Client: **LOS ALAMOS NATIONAL LABS**
Project: **9909184 MILAGRO APP 8K23E30300030000**

Client Sample ID: ***SBS-4.99*** Sample Matrix: ***SOIL*** Sample Collected: ***09/14/99 11:50:00***

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
9909184-04A		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-45	7440-38-2	Arsenic	ND	mg / Kg	1	3		09/23/99

Client Sample ID: ***SS-2.99*** Sample Matrix: ***SOIL*** Sample Collected: ***09/14/99 12:23:00***

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
9909184-05A		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-46	7440-38-2	Arsenic	ND	mg / Kg	1	3		09/23/99

Client Sample ID: ***SBS-2.99*** Sample Matrix: ***SOIL*** Sample Collected: ***09/14/99 12:23:00***

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
9909184-06A		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-49	7440-38-2	Arsenic	ND	mg / Kg	1	3		09/23/99

Client Sample ID: ***SS-1.99*** Sample Matrix: ***SOIL*** Sample Collected: ***09/14/99 12:55:00***

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
9909184-07A		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-50	7440-38-2	Arsenic	ND	mg / Kg	1	3		09/23/99

Client Sample ID: ***SBS-1.99*** Sample Matrix: ***SOIL*** Sample Collected: ***09/14/99 12:55:00***

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
9909184-08A		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-51	7440-38-2	Arsenic	ND	mg / Kg	1	3		09/24/99

Certificate of Analysis

Client: **LOS ALAMOS NATIONAL LABS**

Project: **9909184 MILAGRO APP 8K23E30300030000**

Client Sample ID: ***SS-3.99*** Sample Matrix: ***SOIL*** Sample Collected: ***09/14/99 13:35:00***

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
9909184-09A		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-52	7440-38-2	Arsenic	ND	mg / Kg	1	3		09/24/99

Client Sample ID: ***SBS-3.99*** Sample Matrix: ***SOIL*** Sample Collected: ***09/14/99 13:35:00***

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
9909184-10A		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-53	7440-38-2	Arsenic	ND	mg / Kg	1	3		09/24/99

Client Sample ID: ***SS-3.99 DUP*** Sample Matrix: ***SOIL*** Sample Collected: ***09/14/99 13:35:00***

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
9909184-11A		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-54	7440-38-2	Arsenic	ND	mg / Kg	1	3		09/24/99

Client Sample ID: ***SBS-3.99 DUP*** Sample Matrix: ***SOIL*** Sample Collected: ***09/14/99 13:35:00***

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
9909184-12A		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-55	7440-38-2	Arsenic	ND	mg / Kg	1	3		09/24/99

**** Sample specific Detection Limit is determined by multiplying the sample Dilution Factor by the listed Reporting Detection Limit. ****

**** ND = Not detected: less than the sample specific Detection Limit. Results relate only to the items tested. ****

Quality Control Summary

Client: LOS ALAMOS NATIONAL LABS
Project: 9909184 MILAGRO APP 8K23E30300030000

Explanation of codes	
D	Not applicable due to sample dilution
L	Not applicable due to MDL proximity

QC Type: LCS: Lab Control Spike — QC Matrix: SOLID

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
M991060-002		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-38	7440-38-2	Arsenic	98	(%) Recov	1	NA		09/23/99

QC Type: LCSD: Lab Control Spike Duplicate Accuracy — QC Matrix: SOLID

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
M991060-003		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-39	7440-38-2	Arsenic	95	(%) Recov	1	NA		09/23/99

QC Type: LCSD: Lab Control Spike Duplicate Precision — QC Matrix: SOLID

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
M991060-003		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-39	7440-38-2	Arsenic	3	(%) RPD	1	NA		09/23/99

QC Type: MB: Method Blank — QC Matrix: SOLID

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
M991060-001		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-37	7440-38-2	Arsenic	ND	mg / Kg	1	3		09/23/99

QC Type: MS: Matrix Spike — QC Matrix: SOLID

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
M991060-005		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-41	7440-38-2	Arsenic	86	(%) Recov	1	NA		09/23/99

Quality Control Summary

Client: **LOS ALAMOS NATIONAL LABS**

Project: **9909184 MILAGRO APP 8K23E30300030000**

Explanation of codes	
D	*Not applicable due to sample dilution*
L	*Not applicable due to MDL proximity*

QC Type **MSD: Matrix Spike Duplicate Accuracy** QC Matrix **SOLID**

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
M991060-006		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-42	7440-38-2	Arsenic	81	(%) Recov	1	NA		09/23/99

QC Type **MSD: Matrix Spike Duplicate Precision** QC Matrix **SOLID**

QC Group	Run Sequence	CAS #	Analyte	Result	Units	Dilution Factor	Detection Limit	Code	Run Date
M991060-006		**SW846 3050A/6010A ICP**							
M991060	MW.1999.1109-42	7440-38-2	Arsenic	6	(%) RPD	1	NA		09/23/99

Chain of Custody Record

ASSAIGAI ANALYTICAL LABORATORIES, INC.

7300 JEFFERSON, N.E.
ALBUQUERQUE, NEW MEXICO 87109
(505) 345-8964

3332 WEDGEWOOD
EL PASO, TEXAS 79925
(915) 593-6000

Lab job no.: 9134 Date: 9/14/99

Page 1 of 1

Client: LANL

Project Manager / Contact: BOB BEERS

Address:

Telephone No.: 667-7969

City / State / Zip: LOS ALAMOS, NM

Fax No.: 665-4344

Project Name / Number: MIXED APPLICATION SITE

Samplers: (Signature)

Contract / Purchase Order / Quote:

DA	SS-5.99	9/14/99	11:30	Soil	250 mL Amb			NA	1	X										
2A	SBS-5.99	9/14/99	11:30	Soil	250 mL Amb			NA	1	X										
3A	SS-4.99	9/14/99	11:50	Soil	250 mL Amb			NA	1	X										
4A	SBS-4.99	9/14/99	11:45	Soil	250 mL Amb			NA	1	X										
5A	SS-2.99	9/14/99	12:23	Soil	250 mL Amb			NA	1	X										
6A	SBS-2.99	9/14/99	12:23	Soil	250 mL Amb			NA	1	X										
7A	SS-1.99	9/14/99	12:55	Soil	250 mL Amb			NA	1	X										
8A	SBS-1.99	9/14/99	12:55	Soil	250 mL Amb			NA	1	X										
9A	SS-3.99	9/14/99	13:35	Soil	250 mL Amb			NA	1	X										
10A	SBS-3.99	9/14/99	13:35	Soil	250 mL Amb			NA	1	X										
11A	SS-2.99 DUP	9/14/99	13:35	Soil	250 mL Amb			NA	1	X										
12A	SBS-3.99 DUP	9/14/99	13:35	Soil	250 mL Amb			NA	1	X										

Relinquished by: Signature:	Date: 9/15/99	Received by: Signature:		Relinquished by: Signature:		Date: 9/16/99	Received by: Signature:
Printed: BOBCAT BEERS	Time: 1300	Printed: Elvia J Chavez		Printed: Elvia J Chavez		Time: 8:00AM	Printed:
Company: LANL		Company: AAL		Company:			Company:
Reason:		Reason:		Reason:			Reason:

Method of Shipment: COURIER

Shipment No.:

Special Instructions:

Comments:

After analysis, samples are to be:

- ☐ Disposed of (additional fee)
- ☐ Stored (30 days max)
- ☐ Stored over 30 days (additional fee)
- ☐ Returned to customer

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

Jennifer A. Salisbury
CABINET SECRETARY

Oil Conservation Div.
Environmental Bureau
2040 S. Pacheco
Santa Fe, NM 87505

Memorandum of Meeting or Conversation

Telephone __X___
Personal _____
E-Mail ___X____
Time: 11:30am
Date: January 7, 2000

Originating Party: Wayne Price-OCD

Other Parties: Bob Beers-LANL 667-7969, fax 665-9344, E-Mail bbeers@lanl.gov

Subject: Discharge Plan Renewal Notice for the following Facilities:

GW-031	~~**Name**~~	**expires**	**06/50/2000**	FENTON HILL
GW-___	**Name**	**expires**		
GW-___	**Name**	**expires**		
GW-___	**Name**	**expires**		

WQCC 3106.F. If the holder of an approved discharge plan submits an application for discharge plan renewal at least 120 days before the discharge plan expires, and the discharger is not in violation of the approved discharge plan on the date of its expiration, then the existing approved discharge plan for the same activity shall not expire until the application for renewal has been approved or disapproved. A discharge plan continued under this provision remains fully effective and enforceable. An application for discharge plan renewal must include and adequately address all of the information necessary for evaluation of a new discharge plan. Previously submitted materials may be included by reference provided they are current, readily available to the secretary and sufficiently identified to be retrieved. [12-1-95]

Discussion: Discussed WQCC 3106F and gave notice to submit Discharge Plan renewal application with $50.00 filing fee for the above listed facilities.

Conclusions or Agreements:
Signed: Wayne Price

CC: LANL

Price, Wayne

From: Mail Delivery Subsystem[SMTP:MAILER-DAEMON@lanl.gov]
Sent: Friday, January 07, 2000 12:13 PM
To: Price, Wayne
Subject: Return receipt

[redacted] ATT10532.TXT [redacted] ATT10533.TXT

The original message was received at Fri, 7 Jan 2000 12:13:39 -0700 (MST)
from mailhost.lanl.gov [128.165.3.12]

----- The following addresses had successful delivery notifications -----
<bbeers@esh-mail.lanl.gov> (successfully delivered to mailbox)

----- Transcript of session follows -----
<bbeers@esh-mail.lanl.gov>... Successfully delivered