GTHT -___002___

WELL
EE-3A

STATE OF NEW MEXICO
ERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-103
Adopted 10-1-74
Revised 10-1-78

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SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

Federal Land Use Agreement

5. Indicate Type of Lease: State ☐ Fee ☐

5.a State Lease No.

ot Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application Permit –" (Form G-101) for Such Proposals.)

pe of well: Geothermal Producer ☐ Temp. Observation ☐ Low-Temp Thermal ☐ Injection/Disposal ☒

7. Unit Agreement Name: Fenton Hill

ame of Operator: Los Alamos National Laboratory

8. Farm or Lease Name

ddress of Operator: P.O. Box 1663 Los Alamos, NM 87545

9. Well No.: EE-3

ocation of Well: Unit Letter ____ 1,754 ____ Feet From The East Line and 1,420 Feet From

10. Field and Pool, or Wildcat

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

15. Elevation (Show whether DF, RT, GR, etc.): 8,695'

12. County: Sandoval

Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
ORM REMEDIAL WORK ☐	PLUG AND ABANDON ☐	REMEDIAL WORK ☐	ALTERING CASING ☐
ORARILY ABANDON ☐		COMMENCE DRILLING OPNS. ☐	PLUG & ABANDONMENT ☒
OR ALTER CASING ☐	CHANGE PLANS ☐	CASING TEST AND CEMENT JOB ☐	
		OTHER ____	
THER ____ ☐			

escribe Proposed or completed Operations *(Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any oposed work)* SEE RULE 203.

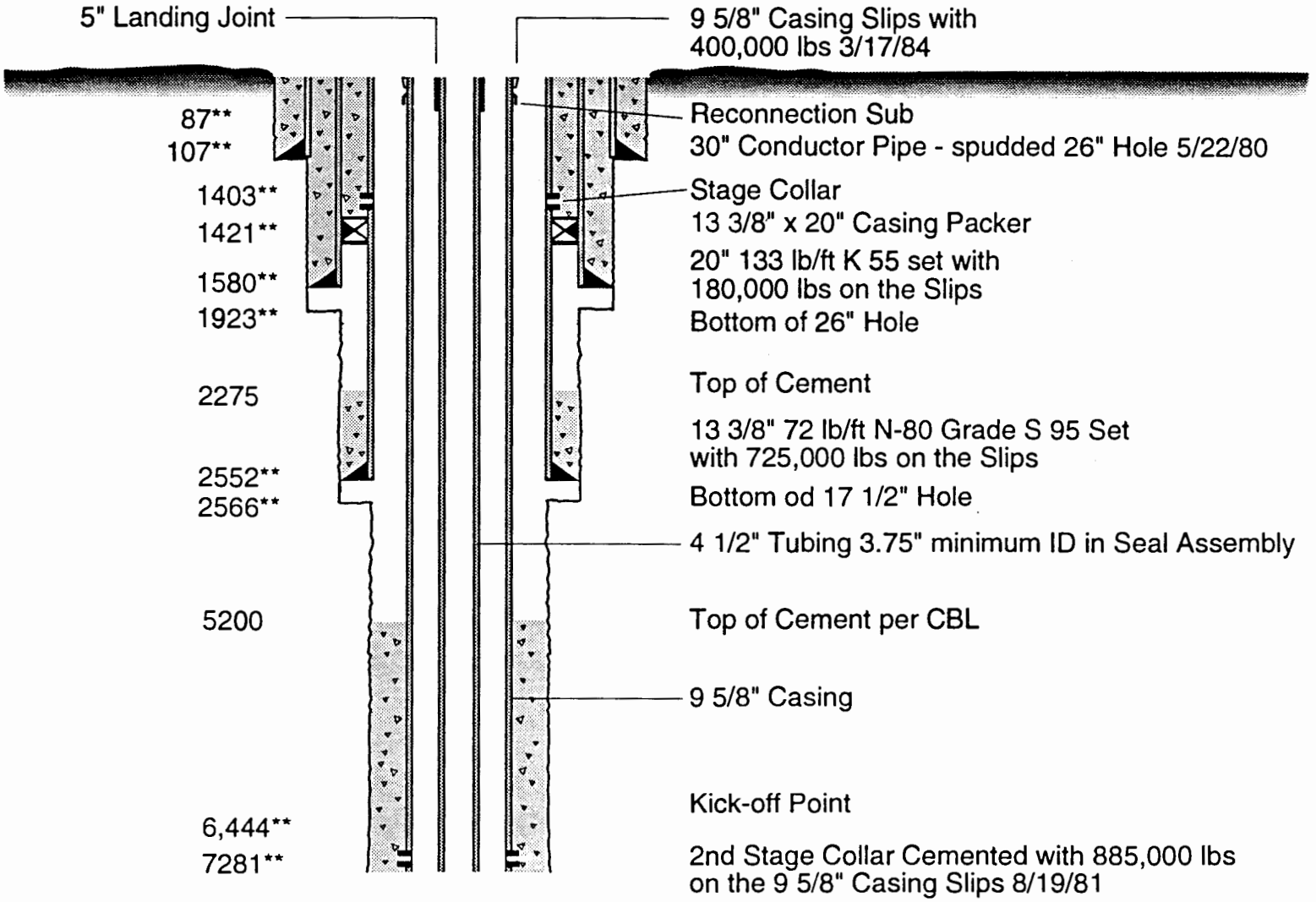
Unsuccessful in removing seal assembly from PBR. Cut 4-1/2" casing at 8,500' and removed from the well. Set 9-5/8" cement retainer at 8,400' and placed cement plug consisting of 150 sk class H plus 40% silica flour, .25% dispersant, and .71% retarder above retainer. Filled hole with 9.0 #/gal mud. Tagged cement top at 7,886'.
Cut 9-5/8" casing at 4,200' and removed from well. Set 60 sk cement plug, same blend as above through open ended drill pipe at 4,250'. Filled hole with 9.1 #/gal mud. Tagged cement to at 4,150'. Set 13-3/8" retianer at 2,450'. Set cement plug, 80 sk, same blend as above, on top of retainer. Placed cement plug at 1,370-1,470' with 80 sk and cement plug from 70' to surface with 65 sk, same blend.
Operations were completed on 11/27/96.

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

D _____ TITLE EES-4 Group Leader DATE 1/17/97

DISTRICT SUPERVISOR 1/15/97

Present Configuration of EE 3-A
As Completed June 17, 1988
(Drawing revised 4 /15/91, all depths in ft)

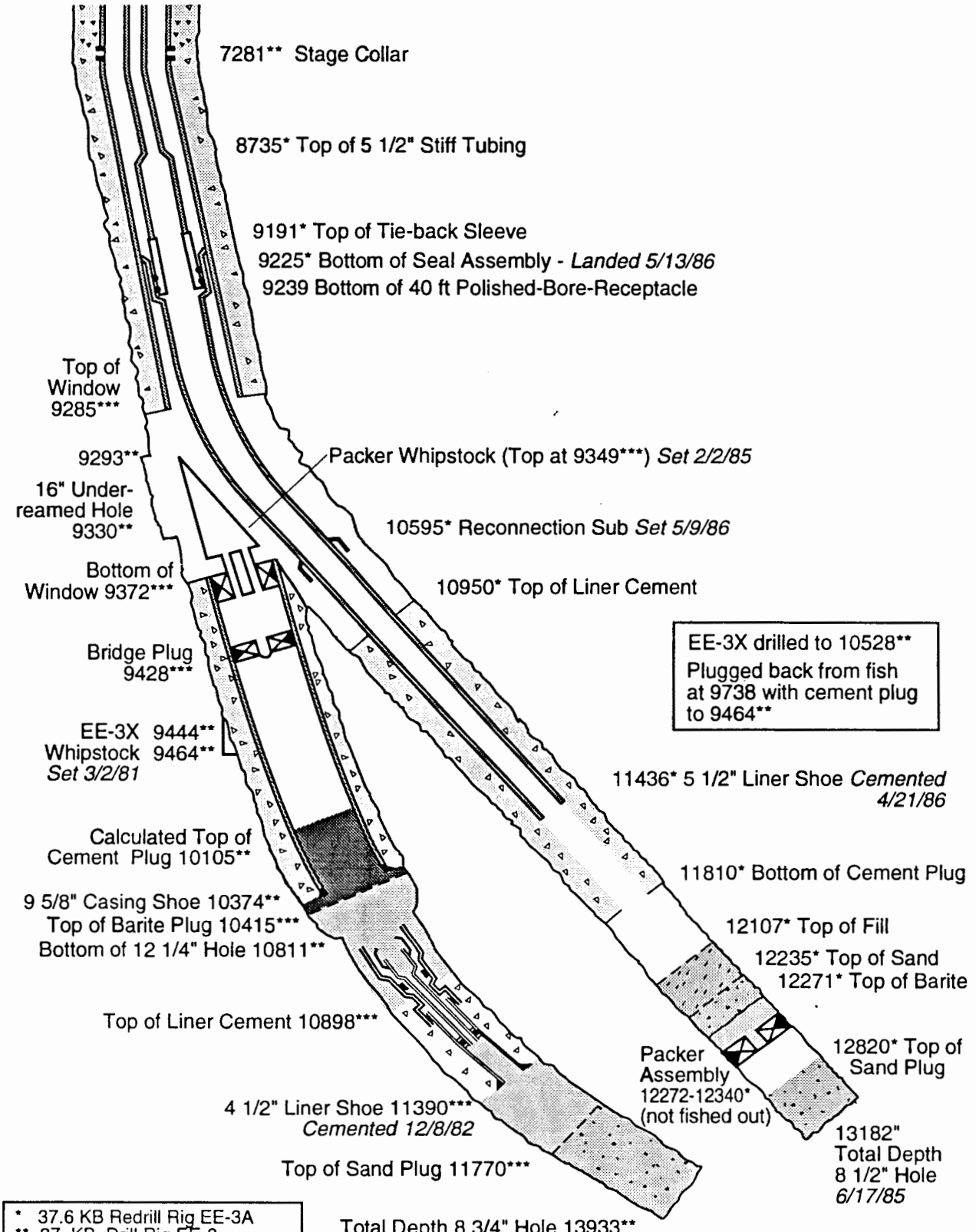


* 37.6 KB Plugback EE-3A
** 27 KB Drill Rig EE-3
*** 22 KB Workover/Completion Rig EE3-Side track EE-3A

Effective 4/30/92

Present Configuration of EE-3A. Completed by May 14, 1986

(Drawing revised 4/15/91, all depths in ft)



Effective 4/30/92

WELL EE-3A
FIELD PLUG REPORT

10/27/96

Move in, rig up, drill rat & mouse holes, nipple down hanger valves to pull 4 1/2" casing, nipple up 12", 3000# BOP and test to 750 psi.
Casing would not pull free.
Rig up wireline truck and run explosive casing charges at 9,000', 8,600, and successful at 8500'.
Lay down 8,500' of 4 1/2" casing.
Make up 8 1/2" bit and 9 5/8" casing scraper.
Pick up 4 3/4" drill collars, 3 1/2" drill pipe and run in to 8,500' checking for obstructions.
Trip out, lay down scraper and make up 9 5/8" cement retainer.
Trip in with retainer to 8,500' and set.
Pump approximately 150,000 gallons of sump water in hole.
Cement with 150 sacks class "H" plus 40% Silica Flour, plus .25% polymer and .71% retarder.
Set 70 sacks below retainer and 70 sacks above.
Pull 5 stands , mix mud and circulate hole.
Well started flowing, diluted cement and flowed it out.
Trip in with retainer to 8,400' and set.
Water would flow up through retainer but could not pump down through it.
Cement with 150 sacks class "H" plus 40% Silica Flour, plus .25% polymer and .71% retarder above retainer.
Pull 5 stands , mix mud to 45 viscosity, 9,0 lb./gal. and circulate hole.
Trip in and tag top of cement at 7,886'.
Trip out, make up casing cutter and cut casing at 4,200'.
Trip out, weld 1 joint 8 5/8" casing inside 9 5/8" casing , pull and lay down 4,200'.
Trip in with 12 1/4" bit, mix mud to 50 viscosity, 9.1 lb./gal and tag top of cement at '.
Trip out with 26 stands and lay down drill pipe.
Make up 13 3/8" cement retainer, set at 2,450'.
Pump 80 sacks class H plus 40% Silica Flour plus .25% polymer dispersant on top of retainer.
Set plugs at 1,470'- 1,370'with 80 sacks and 70'- surface with 65 sacks.
Clean mud tanks & lines.
Release rig at 0:800 hours 11/27/96.

Sam Harvey
Therma Source, Inc.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-103
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SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

Federal Land Use Agreement

5. Indicate Type of Lease: State ☐ Fee ☐
5.a State Lease No.

(Do Not Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application for Permit —" (Form G-101) for Such Proposals.)

Type of well: Geothermal Producer ☐ Temp. Observation ☐ Low-Temp Thermal ☐ Injection/Disposal ☒

7. Unit Agreement Name: Fenton Hill

Name of Operator: Los Alamos National Laboratory

8. Farm or Lease Name:

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

9. Well No.: EE-1

Location of Well: Unit Letter 1,463 Feet From The East Line and 1,501 Feet From the North Line, Section 13 Township 19N Range 2E NMPM.

10. Field and Pool, or Wildcat:

15. Elevation (Show whether DF, RT, GR, etc.): 8,695'

12. County: Sandoval

Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
FORM REMEDIAL WORK ☐	PLUG AND ABANDON ☐	REMEDIAL WORK ☐	ALTERING CASING ☐
PORARILY ABANDON ☐		COMMENCE DRILLING OPNS. ☐	PLUG & ABANDONMENT ☒
- OR ALTER CASING ☐	CHANGE PLANS ☐	CASING TEST AND CEMENT JOB ☐	
THER ☐		OTHER ☐	

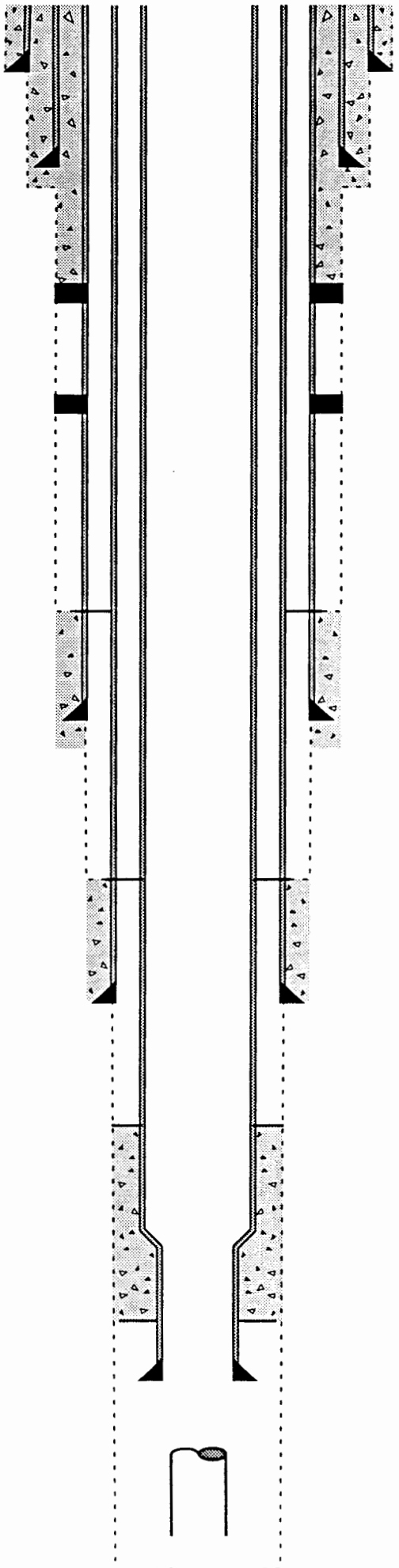
Describe Proposed or completed Operations *(Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any proposed work)* SEE RULE 203.

Set 7-5/8" cement retainer at 8,800' and placed cement plug consisting of 150 sk class H plus 40% silica flour, .25% dispersant, and 1.15% retarder below retainer. Stung out of retainer and placed 40 sk plug, same blend as above, on top of retainer. Filled hole with mud. Tagged cement top at 8,590'. Cut 8-5/8" casing at 6,500' and removed from well. Ran cement bond log in 10-3/4" casing to 500' and verified cement in 10-3/4" x 13-3/8" annulus. Set 10-3/4" retainer at 6,300' and placed 110 sk class H plus 40% silica flour above retainer. Filled hole with mud. Tagged cement top at 6,178'. Set cement plugs in 10-3/4" casing at 4,300'-4,100', 2,300'-2,100' and 70' to surface. Cut off wellhead, welded plate with identification markings on casing top, and levelled location.

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

ED [signature] TITLE EES-4 Group Leader DATE 1/17/97

[signature] DISTRICT SUPERVISOR 2/25/97



KB Depths

25 ft — KB 8711 ft - GL 8696 ft
48" hole drilled to 10' GL
30" culvert SA 10' GL with 10 yards concrete

270 ft — 10 3/4" casing parted at 270' - cemented four times with a total of 500 sacks

580 ft — 20" 94# H-40 BT&C casing SA 580' with 830 ft^3 cement

600 ft — 26 1/2" hole drilled to 600'

790 ft — 13 3/8" stage collar

Wellbore Diagram for EE-1 9-22-81

1783 ft — 13 3/8" stage collar cemented without returns
Cement lost to LC zone

1905 ft — Lost circulation zone in 17 1/2" hole

2100 ft — Calculated top of cement on first stage recementing of 13 3/8" casing

2401 ft — Top of Precambrian

2431 ft — 13 3/8" 54.5# k-55 ST&C casing SA 2432" with 225 sacks of cement on recementing

2600 ft — 17 1/2" hole drilled to 2600'

3350 ft — Lost circulation zone in 12 1/4" hole

4640 ft — Top of cement per CBL on cementing of 10 3/4" casing

6420 ft — 10 3/4" 45.5# K-55 BT&C casing SA 6420 with 300 ft^3 cement

7700 ft — Top of cement per CBL at 7700' on cementing of of 8 5/8x7 5/8"casing

7936 ft — Lost circulation zone in 9 7/8" hole

8600 ft — Bottom of 8 5/8" 32# k-55 LT&C casing
Top of 7 5/8" 26.4# N-80 Hydril casing

9020 ft — Bottom of cement per CBL at 9020'

9599 ft — 7 5/8" 26.4# N-80 Hydril casing SA 9599' with 240 ft^3 and recemented with 180 ft^3

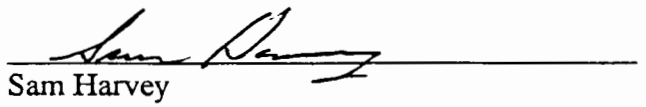
9747 ft — Top of fish (5 1/2" casing and inflatable packers)

10,053 ft — TD of 9 5/8" hole (cleaned out with 6 3/4' bit)

WELL EE-1
FIELD PLUG REPORT

10/27/96

Move in, rig up, drill rat & mouse holes, nipple up 12", 3000# BOP and test to 750 psi.
Make up 6 3/4" bit and 7 5/8" casing scraper.
Pick up 4 3/4" drill collars, 3 1/2" drill pipe and run in to 9,600' checking for obstructions.
Trip out, lay down scraper and make up 7 5/8" cement retainer.
Trip in with retainer to 8,800' and set.
Pump approximately 680,000 gallons of sump water in hole.
Cement with 150 sacks class "H" plus 40% Silica Flour, .25% polymer and 1.15% retarder below retainer.
Sting out of retainer and dump 40 sacks on top.
Pull 5 stands , mix mud and circulate hole. Trip in and tag top of cement at 8,590'.
Trip out, make up casing cutter and cut casing at 6,500'.
Trip out, make up casing spear, pull and lay down 6,500' 8 5/8" casing.
Make up 9 7/8" bit and casing scraper and round trip to 6,500' scraping casing.
Run Cement Bond Log, 10 3/4" casing is cemented to 13 3/8" casing.
Make up 10 3/4" cement retainer, set at 6,300'.
Cement with 110 sacks below retainer, sting out and dump 40 sacks on top.
Pull 5 stands , mix mud and circulate hole.
Trip in and tag top of cement at 6,178'.
Set plugs at 4,300'- 4,100', 74 sacks inside 10 3/4", at 2,300'- 2,100', 75 sacks inside 10 3/4" and 70'- 0, 50 sacks inside 10 3/4".
Nipple down and pump excess mud to frac tanks.
Release rig to move at 1200 hours 11/8/96.



Sam Harvey
Therma Source, Inc.

STATE OF NEW MEXICO
ERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-103
Adopted 10-1-74
Revised 10-1-78

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SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

Federal Land Use Agreement

5. Indicate Type of Lease State ☐ Fee ☐

5.a State Lease No.

Not Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application Permit –" (Form G-101) for Such Proposals.)

ype of well Geothermal Producer XX Temp. Observation ☐
Low-Temp Thermal ☐ Injection/Disposal ☐

7. Unit Agreement Name
Fenton Hill

lame of Operator
Los Alamos National Laboratory

8. Farm or Lease Name

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

9. Well No.
GT-2

ocation of Well
nit Letter 1,525 Feet From The East Line and 1,747 Feet From

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

10. Field and Pool, or Wildcat

15. Elevation *(Show whether DF, RT, GR, etc.)*
8,695'

12. County
Sandoval

Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:

FORM REMEDIAL WORK ☐ PLUG AND ABANDON ☐
PORARILY ABANDON ☐
– OR ALTER CASING ☐ CHANGE PLANS ☐
THER ☐

SUBSEQUENT REPORT OF:

REMEDIAL WORK ☐ ALTERING CASING ☐
COMMENCE DRILLING OPNS. ☐ PLUG & ABANDONMENT ☒
CASING TEST AND CEMENT JOB ☐
OTHER ☐

Describe Proposed or completed Operations *(Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any roposed work)* SEE RULE 203.

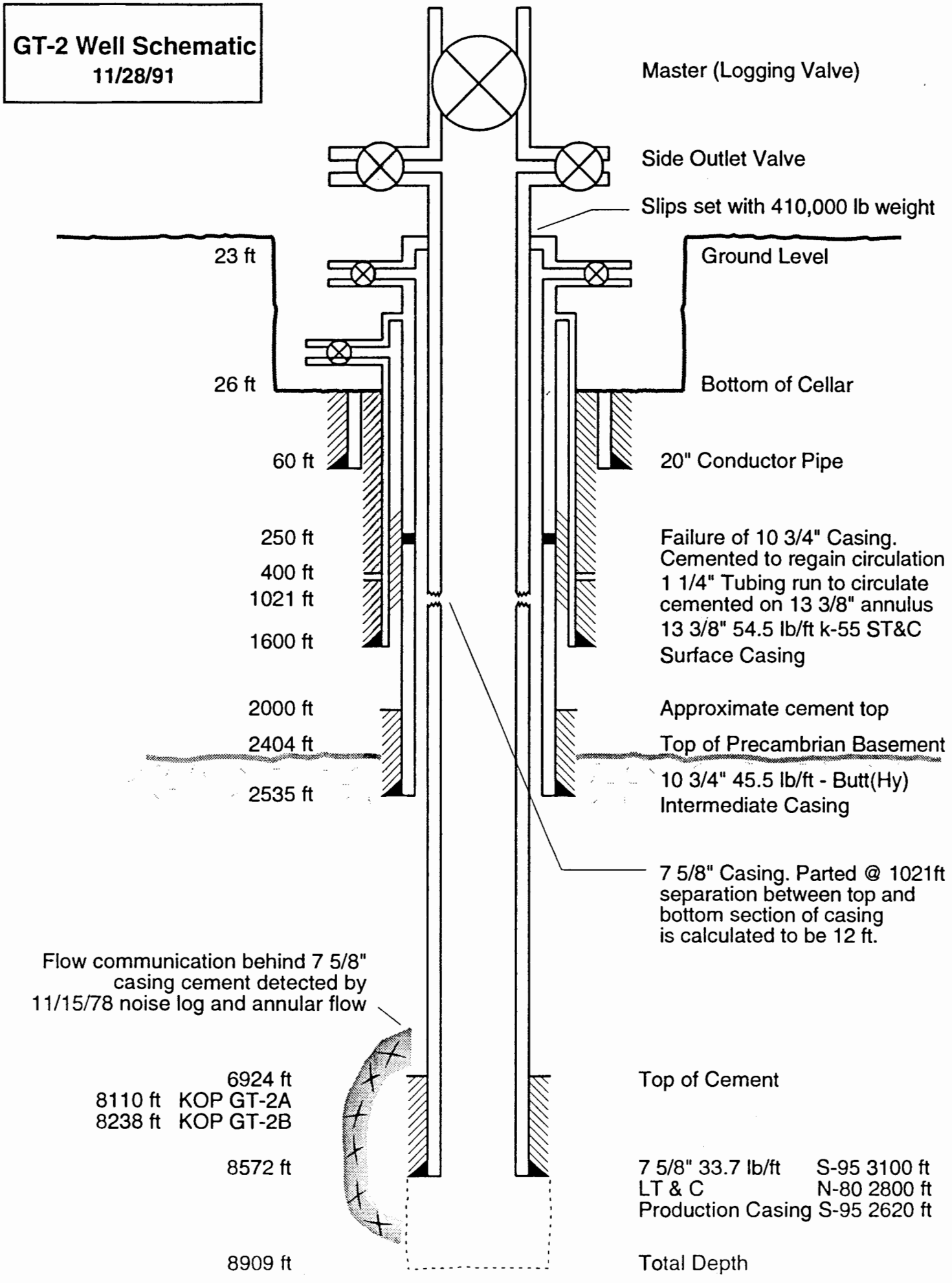
Set 7-5/8" cement retainer at 8,490' and pumped 195 sk class H plus 40% silica flour, .25% dispersant, and 1.15% retarder below retainer. Stung out of retainer and placed 38 sk cement, same blend as above, on top of retainer. Removed 1,012' 7-5/8" casing from above casing part. Speared 7-5/8" casing top, calculated free point at 6,500'. Cut casing at 6,500', then 6,400', the 5,800' before it came free. Removed 5,800' 7-5/8" casing from the well. Tagged cement top at 8,290'. Set class H cement plugs with 40 % silica flour and additives at 6,270'-6,170', 4,270'-4,170', and 2,585'-2,485'. Set 10-3/4" retainer at 2,480' and set cement plugs, same mixture as above, at 2,480'-2,280', 1,650'-1,550', and 50' to surface.
Cut off wellhead, welded steel plate with identification markings on casing top and levelled location.

Operations were completed on 10/24/96.

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

D James A. Vaughn TITLE EES-4 Group Leader DATE 1/17/97

VED BY [signature] TITLE DISTRICT SUPERVISOR DATE 2/25/97


GT-2 Well Schematic
11/28/91
Master (Logging Valve)
Side Outlet Valve
Slips set with 410,000 lb weight
23 ft
Ground Level
26 ft
Bottom of Cellar
60 ft
20" Conductor Pipe
250 ft
400 ft
1021 ft
1600 ft
Failure of 10 3/4" Casing.
Cemented to regain circulation
1 1/4" Tubing run to circulate
cemented on 13 3/8" annulus
13 3/8" 54.5 lb/ft k-55 ST&C
Surface Casing
2000 ft
Approximate cement top
2404 ft
Top of Precambrian Basement
2535 ft
10 3/4" 45.5 lb/ft - Butt(Hy)
Intermediate Casing
7 5/8" Casing. Parted @ 1021ft
separation between top and
bottom section of casing
is calculated to be 12 ft.
Flow communication behind 7 5/8"
casing cement detected by
11/15/78 noise log and annular flow
6924 ft
Top of Cement
8110 ft KOP GT-2A
8238 ft KOP GT-2B
8572 ft
7 5/8" 33.7 lb/ft S-95 3100 ft
LT & C N-80 2800 ft
Production Casing S-95 2620 ft
8909 ft
Total Depth

WELL GT-2
FIELD PLUG REPORT

10/15/96

Move in, rig up, drill rat & mouse holes, nipple up 12", 3000# BOP and test to 750 psi.
Make up 6 1/2" bit and 7 5/8" casing scraper.
Pick up 4 3/4" drill collars, 3 1/2" drill pipe and run in to 8,500' checking for obstructions.
Trip out, lay down scraper and make up 7 5/8" cement retainer.
Trip in with retainer to 8490' and set.
Cement with 195 sacks (63 bbls) class "H" plus 40% Silica Flour, .25% polymer and 1.15% retarder below retainer.
Displaced with 50.5 bbls water before pressuring up to 2200#.
Sting out of retainer and dump 12.5 bbls (38 sacks) on top.
Trip out, make up casing spear, pull and lay down 1012' 7 5/8" casing.
Pick up 4 1/2" drill pipe and run in with spear.
Work casing to calculate free point, estimate free at 6500'.
Cut casing at 6500' and 6460', casing would not come.
Re-cut casing at 5800' and lay it down.
Make up 9 7/8" bit and casing scraper and round trip to 2500' scraping casing.
Trip in open ended with 3 1/2" drill pipe and tag cement at 8290'.
Lay down drill pipe and set plugs at 6270', 18 sack (100' coverage) plug inside 7 5/8" casing, 4270, 45 sack (100' coverage) plug inside 9 7/8" hole and 2585', 18 sack (100' coverage) plug inside 9 7/8" hole.
Make up 10 3/4" cement retainer, set at 2480' and set plugs at 2480'-2280', 90 sacks inside 10 3/4", at 1650'-1550', 45 sacks inside 10 3/4" and 50'-0 16 sacks inside 10 3/4".
Nipple down and pump excess mud to frac tanks.
Release rig to move at 1800 hours 10/23/96.

Sam Harvey
Therma Source, Inc.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

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SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

Federal land use agreement

5. Indicate Type of Lease State ☐ Fee ☐

5.a State Lease No.

Do Not Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application for Permit –" (Form G-101) for Such Proposals.)

1. Type of well: Geothermal Producer ☐ Temp. Observation ☐ Low-Temp Thermal ☐ Injection/Disposal ☒

7. Unit Agreement Name: Fenton Hill

2. Name of Operator: Los Alamos National Laboratory

8. Farm or Lease Name

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

9. Well No.: GT-1

4. Location of Well
Unit Letter 403 Feet From The East Line and 1,253 Feet From The South Line, Section 1 Township 19N Range 2E NMPM.

10. Field and Pool, or Wildcat

15. Elevation (*Show whether DF, RT, GR, etc.*): 8,451'

12. County: Sandoval

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 ☐		COMMENCE DRILLING OPNS. ☐	PLUG & ABANDONMENT ☒
PULL OR ALTER CASING ☐	CHANGE PLANS ☐	CASING TEST AND CEMENT JOB ☐	
OTHER ☐		OTHER ☐	

Describe Proposed or completed Operations (*Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any proposed work*) SEE RULE 203.

Attempted to remove 5" casing. Would not come free with 120,000#.
Set 5" retainer at 2,300'. Could not pump through retainer. Stung out and placed 9sk class H plus 40% silica flour and 1/4#/sk Flow Seal on top of retainer (100+ linear ft) Cut 5" casing at 1,400' and removed from well. Pumped 40 sk cement blend same as above through open ended pipe at 1,420'. Filled hole with 9.2 #/gal mud. Tagged cement top at 1,222'. Cemented from 110' to surface with 30 sk cement, same blend as above. Cut off wellhead and welded steel plate with identification markings on casing top. Operations were completed on 9/27/96.

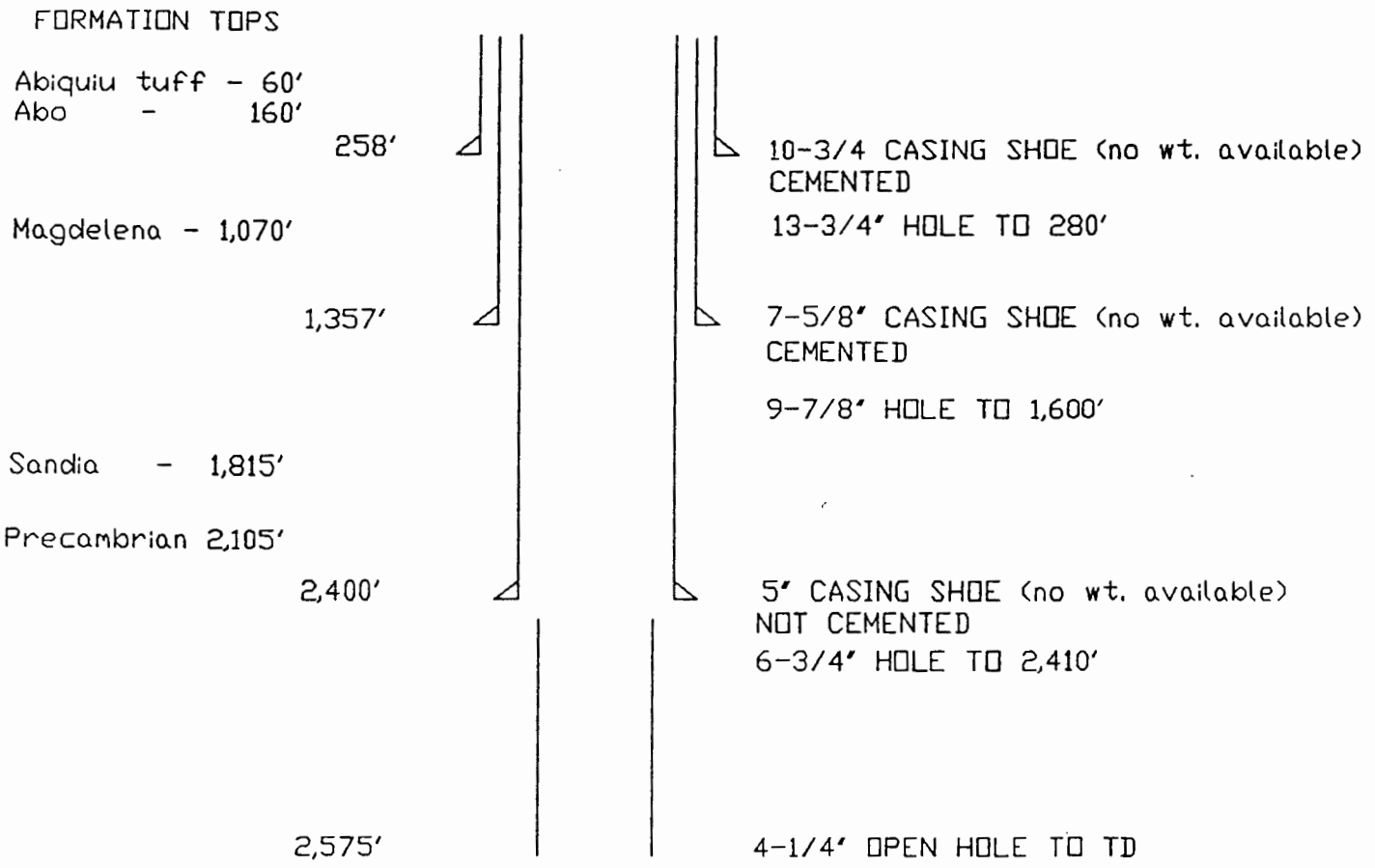
I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNED [signature] TITLE EES-4 Group Leader DATE 1/17/97

APPROVED BY [signature] TITLE DISTRICT SUPERVISOR 2/25/97

GT-1 WELLBORE SCHEMATIC

5/29/96



Notes: Although not documented, the 10-3/4" and 7-5/8" casing strings were probably only cemented a few feet at the bottom, but there may have been cement poured behind the casing.

WELL COMPLETED 6/30/72
LOCATED IN BARLEY CNYN

STATE OF NEW MEXICO
ERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

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lot Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application Permit –" (Form G-101) for Such Proposals.)

pe of well Geothermal Producer ☐ Temp. Observation XX
Low-Temp Thermal ☐ Injection/Disposal ☐

7. Unit Agreement Name: Fenton Hill

ame of Operator: Los Alamos National Laboratory

8. Farm or Lease Name:

ddress of Operator: P.O. Box 1663 Los Alamos, NM 87545

9. Well No.: PC-1

ocation of Well
nit Letter 1,966 Feet From The West Line and 3,048 Feet From
ne North Line, Section 18 Township 19N Range 3E NMPM.

10. Field and Pool, or Wildcat

15. Elevation (Show whether DF, RT, GR, etc.): 8,400'

12. County: Sandoval

Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:

ORM REMEDIAL WORK ☐ PLUG AND ABANDON ☐
ORARILY ABANDON ☐
. OR ALTER CASING ☐ CHANGE PLANS ☐
THER ☐

SUBSEQUENT REPORT OF:

REMEDIAL WORK ☐ ALTERING CASING ☐
COMMENCE DRILLING OPNS. ☐ PLUG & ABANDONMENT ☒
CASING TEST AND CEMENT JOB ☐
OTHER ☐

escribe Proposed or completed Operations *(Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any oposed work)* SEE RULE 203.

Cut 4-1/2" casing at 1,300' and removed from the well. Cleaned out 7" casing to 1,250', ran 7" cement retainer which set prematurely at 1,005'. Cut 7" casing at 980', 780', and 580' but could not pull free. Cut 7" casing at 100' and removed from well. 7" x 8-5/8" annulus had been cemented and not documented when the well was drilled. Placed 40 sk class H plus 40% silica flour and 1/4 #/sk Flow Seal on top of retainer at 1,005'. Filled hole with mud. Tagged cement top at 974'. Set 20 sk plug, same blend as above, on top of previous plug. Hole stayed full. Pumped 20 sk plug, same blend as above, across cut at 580' through open ended pipe at 650'. Set 8-5/8" retainer at 90'. Squeezed 64 sk cement, same blend as above, and circulated to surface through 8-5/8" x 10-3/4" annulus. Stung out of retainer and cemented to surface. Cut off wellhead, welded steel plate with identification markings to casing top. Operations were completed on 10/1/96.

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

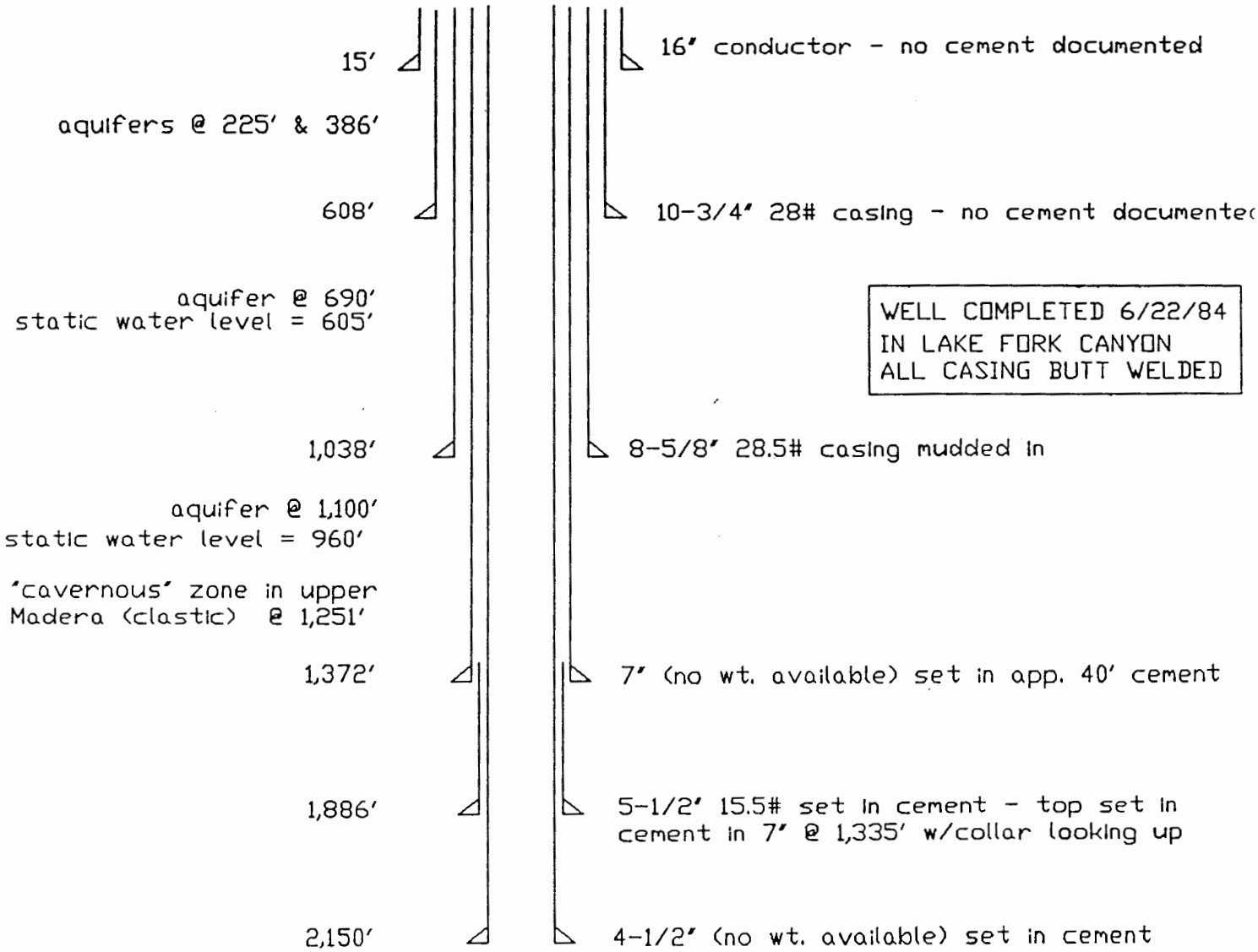
D James J. Allen TITLE EES-4 Group Leader DATE 1/17/97

VED BY Ky E. Johnson TITLE DISTRICT SUPERVISOR DATE 2/25/97

PC-1 WELLBORE SCHEMATIC

5/17/96

DATA DERIVED FROM D.MILES DAILY REPORTS



TOTAL DEPTH = 2,178' IN PRECAMBRIAN
DRILLING ASSY WAS LEFT ON BOTTOM

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-103
Adopted 10-1-74
Revised 10-1-78

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SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

Federal Land Use Agreement

5. Indicate Type of Lease: State ☐ Fee ☐

5.a State Lease No.

(Do Not Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application for Permit —" (Form G-101) for Such Proposals.)

Type of well: Geothermal Producer ☐ Temp. Observation ☒ Low-Temp Thermal ☐ Injection/Disposal ☐

7. Unit Agreement Name: Fenton Hill

Name of Operator: Los Alamos National Laboratory

8. Farm or Lease Name

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

9. Well No.: PC-2

Location of Well: Unit Letter 4,458 Feet From The East Line and 3,038 Feet From the North Line, Section 13 Township 19N Range 2E NMPM.

10. Field and Pool, or Wildcat

15. Elevation (Show whether DF, RT, GR, etc.): 8,635'

12. County: Sandoval

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 ☐		COMMENCE DRILLING OPNS. ☐	PLUG & ABANDONMENT ☒
PULL OR ALTER CASING ☐	CHANGE PLANS ☐	CASING TEST AND CEMENT JOB ☐	
OTHER ☐		OTHER ☐	

Describe Proposed or completed Operations *(Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any proposed work)* SEE RULE 203.

Perforated 7" casing at 1,750'. Set 7" cement retainer at 1,700', filled hole with water, pumped 186 sk class H plus 40% silica flour and 1/4#/sk Flow Seal below retainer. Stung out of retainer and placed 20 sk cement of same blend on top of retainer. Perforated 7" casing at 1,480'. Set 7" retainer at 1,400' and pumped 52 sk cement plug, same blend as above, below retainer. Circulated cement out 7" x 8-5/8" annulus. Stung out of retainer and set 20 sk cement plug, same blend as above, on top of retainer. Filled hle with 9.1 #/gal mud. Set cement plug from 60' to surface. Cut off wellhead, and welded steel plate with well identification on casing top.

Operations were completed on 10/2/96.

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

SIGNED [signature] TITLE EES-4 Group Leader DATE 1/17/97

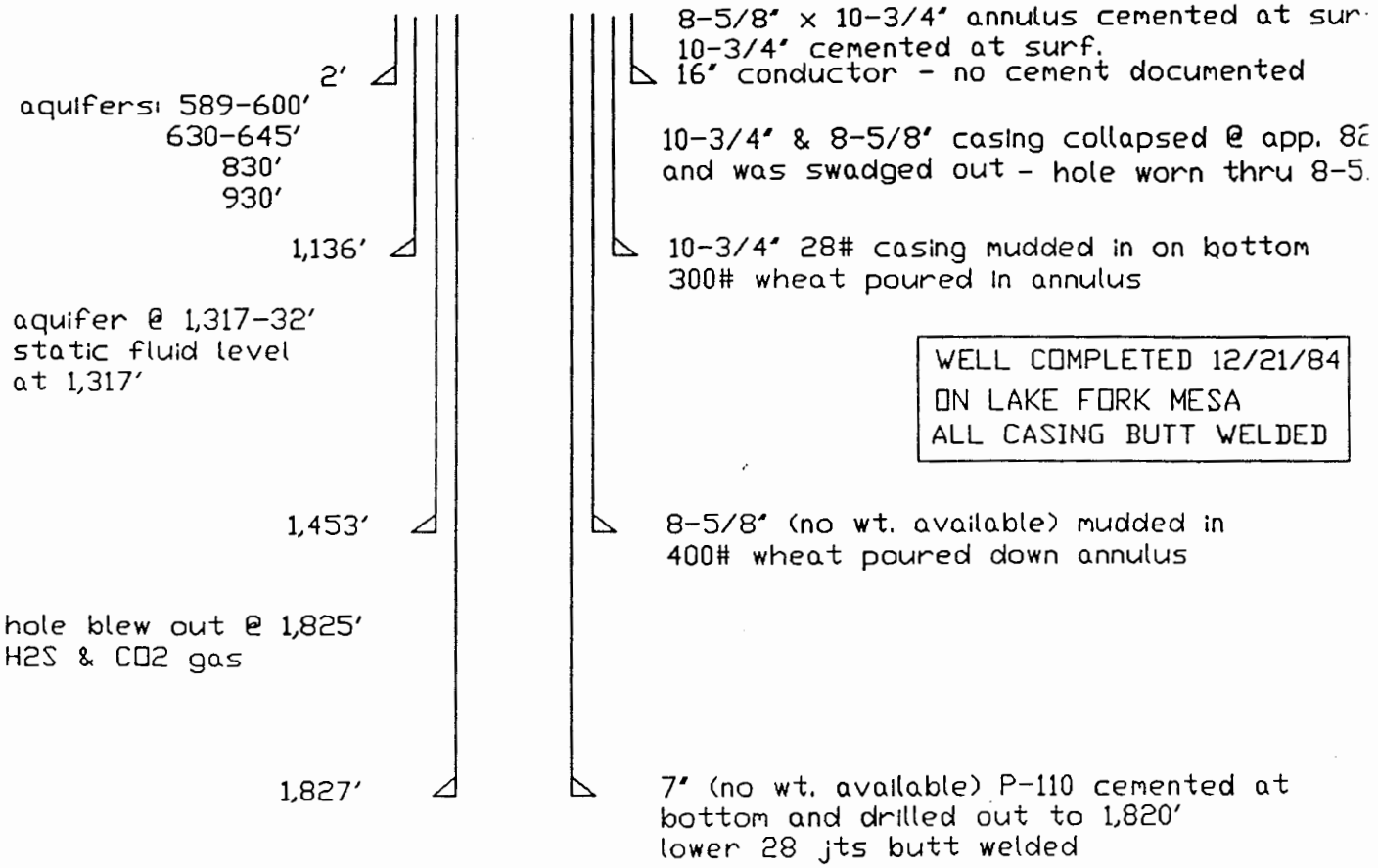
APPROVED [signature] TITLE DISTRICT SUPERVISOR DATE 1/24/97

CONDITIONS OF APPROVAL, IF ANY:

PC-2 WELLBORE SCHEMATIC

5/17/96

DATA DERIVED FROM D.MILES DAILY REPORTS



FENTON HILL HOT DRY ROCK PROJECT
Daily Well Abandonment Activity

9/9/96 Move in rig and equipment to main project site.

Daily Project Cost	3,393
Cumulative	6,113

Well THC

9/10/96 Move equipment to well site and rig up to pull 4 1/2" casing. Pulled up to 60,000# over estimated string weight. Pipe stretch indicated was stuck 520-580 feet deep. Records showed a formation change at 580 foot. Rigged up wireline truck and ran in hole to 52 with casing caliper, pulled caliper, run explosive casing shot to 500' and shot casing apart. Laid down 500', 15 joints and cutoff.
Set rig anchors on THA, THB, THC, THD, GT1, PC1 and PC2
Shut down for day .

Rig 12 hours	
Daily Project Cost	7,904
Cumulative	14,017

9/11/96 Pick up 2 3/8" tubing and run in hole to 650', set down solid. Pump 15 barrels fresh water to fill hole. Cement from 650' (120' Inside casing stub) to surface. Pumped 128 sacks Class H premium cement blended with 40% Silica Flour with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack. Circulated while cementing and had good cement to surface. While laying down tubing, cement fell back 100'. Pumped 20 sacks of same blend cement to fill hole. Cement falling back slowly (10' in 1/2 hour), top off with 4 sacks hole stayed full.
Rig down equipment.

Well THB

Move in rig and rig up equipment and spear into 4 1/2" casing. Pulled 60,000 # and casing came free. Laydown 17 joints 650', 4 1/2" casing. Pickup 2 3/8" tubing to 650'. Load hole with 12 bbls fresh water. Cement from 650' to 300' with 45 sacks blended with 40% Silica Flour and 3% Calcium Chloride with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack. Circulated out fresh water while cementing.
Shut down for day.

Rig 12. 5 hours	
Daily Project Cost	9,869
Cumulative	23,886

9/12/96 Run in hole and tag cement top at 415'. Rig up to cement and pump 80 sacks Class H premium cement blended with 40% Silica Flour with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack. Circulated while cementing and had good cement to surface. Lay down tubing. Cement falling back, wait 3 hours and tag cement top at 85'. Pump 32 sacks of same blend cement and fill hole, hole stayed full. Rig down rig and equipment, location to muddy to move.

Rig 9 hours	
Daily Project Cost	6,043
Cumulative	29,869

FENTON HILL HOT DRY ROCK PROJECT
Daily Well Abandonment Activity

9/13/96
Well WW-3

Move in and rig up. Pull and work 16" casing up to 75,000#, stretch indicates pipe stuck at 380'. Rig up wireline and tag bottom at 468' inside casing. Rig down.

WW-2 Move in and rig up to pull casing. Pull and work 16" casing up to 75,000#, string up 4 lines, work casing up to 95,000# casing came loose. Lay down casing and shut down for weekend.

Rig 12 hours	
Daily Project Cost	4,270
Cumulative	34,139

9/16/96 Rig down.

WW-3 Move in and rig up to try to pull casing again. Work casing up to 108,000# would not move. Pump 216 cubic feet sand down 16" casing and 54 cubic feet down annulus, tag sand at 300". Pump 85 sacks Class H premium cement blended with 40% Silica Flour with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack down 16" casing and 25 sacks same blend down annulus. wait on cement to harden to tag top.

WW-2 Pump 270 cubic feet sand down open hole. Rig up wire line and tag top of sand at 350'. Pump 125 sacks Class H premium cement blended with 40% Silica Flour with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack, wait on cement to harden to tag top. Shut down for day.

Rig 9 hours	
Daily Project Cost	10,865
Cumulative	46,204

9/17/96

WW-2 Tag cement top in open hole, at 313' with wire line, pump 120 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack.

WW-3 Tag cement top at 237' inside 16" with wire line, then pumped 42 barrels gel water in to fill pipe for top plug. Because of the extra cement needed on WW-2 pumped additional 70 sacks of same blend cement down annulus. to insure 100' coverage. Rig down

PC-1 Move in and rig up to pull 4 1/2" casing. Run in with 4 1/2" ring gauge on wire line to 1320" checking casing ID. Make up explosive shot and shoot casing at 1300'. Lay down 32 joints and cutoff joint (1300').

Rig 12 hours	
Daily Project Cost	8,744
Cumulative	54,948

9/18/96

WW-2 Rig up wire line truck and tag cement top in open hole at 309', had 4' of cement fill.

WW-3 Rig up pump truck and pumped 56 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack top plug inside 16" from 60' to surface.

PC-1 Dress top of 7" casing and run in with ID gauge, stopped at 860'. Make up 6 1/8" bit and pick up tubing to 1000', tubing stopped. Pump fresh water and clean out 7" casing to 1250'. Pull out of hole and run in with cement retainer, retainer hung up at 1,005' and could not get it loose. Pull out of hole and check stinger, trip in and sting into retainer. Pump through retainer and pressured up to 1,000#, would bleed off 100# per hour.

Rig 12 hours	
Daily Project Cost	5,787
Cumulative	60,735

9/19/96

PC-1 Pull out of hole with tubing, Rig up wire line truck and run explosive casing shot at 980'. Work casing up to 110,000# and torque left and right trying to make it break at cut. Run second explosive casing shot at 780'. Work casing up to 110,000# and torque left and right trying to make it break at cut. Turn 7" casing 1/2 turn to the right and casing bound in 8 5/8' casing and did not lose stretch. Need additional tools on this well. Rig down.

TH-A Move in and rig up to pull 4 1/2" casing.

WW-2 Dumped 324 cubic feet sand down open hole.

WW-3 Dumped 216 cubic feet sand down annulus.

Rig 12 hours	
Daily Project Cost	8,174
Cumulative	68,909

9/20/96

WW-2 Tag top of sand at 187' with wire line truck.

TH-A Pull 78,000# on 4 1/2" casing and it came loose. Lay down 16 joints (590") casing. Pick up tubing and run in to 560'. Rig up pump truck and load hole with 12 barrels water. Pump 50 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack. Pull out of hole and wait for cement to set. Tag cement at 295'. Pump 13 barrels of 40 viscosity, 9.2# mud in hole and lay down tubing. Started pumping surface plug at 55' and lost returns. Continued pumping and had good cement to surface with 95 sacks of same blend cement, hole stayed full. Start rigging down.

Rig 10 hours	
Daily Project Cost	7,943
Cumulative	76,852

9/23/96

TH-A Rig down.

TH-D Move in and rig up to pull 4 1/2' casing. Pull and work up to 90,000#, casing came loose, lay down 15 1/2 joints (500') casing. Pick up 500' tubing and rig up pump truck. Load hole with 16 barrel fresh water, pump 47 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1. 56, mixed at 15. 6 lb./gal using 6.34 gal/water per sack. Circulated steady while cementing and fluid in hole fell back slowly when finished, WOC.

Rig 12 hours	
Daily Project Cost	6,012
Cumulative	84,064

9/24/96

TH-D Run in hole with tubing and tag top of cement at177'. Pump 10 barrels 40 viscosity, 9.1# gel water in hole. Lay down tubing and pump 24 sacks same blend cement surface plug a 55'. Cement fell back 14', topped off with 4 sacks, installed well cap, cut anchors below ground level and rig down.

GT-1 Move in and rig up to pull 5" casing. Inside of casing is egg shaped and casing spear would not go in, will need different grapples.

Rig 10 hours	
Daily Project Cost	3,587
Cumulative	87,651

9/25/96

GT-1 Make up casing spear and work 5" casing up to 120,000#, would not come free. Make up 4 1/4" bit and pick up tubing to 2300'. Pull out of hole, make up cement retainer, trip in to 2300' and set retainer. Try to pump through retainer, but pressured up to 1,000# and held steady. Pull out of retainer and pump 9 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1.56, mixed at 15. 6 lb./gal using 6.34 gal/water per sack, 100'+ coverage. Stand back 1250' tubing and lay the rest down. Rig up wire line truck and run explosive casing cutter at 1400'. Lay down 44 joints and cut off joint of 5" casing.

Rig 12 hours	
Daily Project Cost	7,349
Cumulative	95,000

9/26/96

GT-1 Trip in open ended with tubing to 1420'. Pump 40 Sacks same blend cement to cover 30C circulated while cementing and hole stayed full. Pull up to 1000' and WOC. Trip in with tubing and tag cement at 1222'. Pump hole full of 43 viscosity, 9.2# mud. Lay down tubing to 110'. Pump 30 sacks same blend cement and circulated good cement. Lay dow tubing and cut off well head assembly. Cement falling back very slow, will top off tomorrow. Rig down

PC-1 Move in and start rigging up.

Rig 12 hours	
Daily Project Cost	6,301
Cumulative	101,301

9/27/96

GT-1 Topped cement off with 20 sacks, hole stayed full.

PC-1 Rig up to pull 7" casing with spear, jar and pull casing up to 125,000#, stretch indicates stuck at 620'. Rig up wire line and shoot explosive casing cutter at 580'. Work casing up to 125,000# and try to rotate, would not come free. Shoot explosive casing cutter at 100' lost cable head and collar locator in hole. Work casing up to 80,000# casing started moving. Lay down casing and break down fishing tools. Cement has been poured down annulus and casing showed cement on all that was laid down.

Rig 12.5 hours	
Daily Project Cost	7,306
Cumulative	108,607

9/30/96

PC-1 Trip in to 100' with 7 7/8" bit to clean out cement and pull out. Trip in open ended to 1004 to retainer. Pump 40 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1. 56, mixed at 15.6 lb./gal using 6.34 gal/water per sack. Pull above cement and fill hole with mud and WOC. Tag cement at 974', cement went out hole where pipe was cut. Pump 20 sacks same blend cement, hole stayed full. Pull up to 650', pump 20 sacks cement across cut at 580' and down tubing. Pick up 8 5/8" retainer and run in to 90'. Squeeze 64 sacks cement through retainer until came to surface between 8 5/8" and 10 3/4" casing. Pull out of retainer and pump 30 sacks circulating good cement to surface inside 8 5/8" and some down 16". I telephoned Roy Johnson with OCD and received approval to plug this well this way and PC-2 by perforating and squeezing.

WW-2 Dump 9 yards ready mix cement and fill hole full.

Rig 12.5 hours	
Daily Project Cost	10,075
Cumulative	119,882

10/1/96

PC-1 Cement fell between 10 3/4" and 16" casing, Pump 25 sacks and hole stayed full rig down Cut anchors below ground level and install well cap. Release rig 10/1/96.

PC-2 Move in and rig up. Fill 7" casing with water. Rig up wire line truck and run 7" casing ID gauge 1770. Run perforating gun on wire line to 1750' and shoot 2, 1/2" holes in 7" casing and well went on vacuum. Run in with cement retainer to 1700' and set, load hole with 50 barrels water. Sting back in and pump 186 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1. 56, mixed at 15.6 lb./gal using 6.34 gal/water per sack, started pressuring up on last20 sacks. Sting out, pump 20 sacks of same blend cement on top of retainer and trip out.

Rig 13 hours	
Daily Project Cost	12,122
Cumulative	132,004

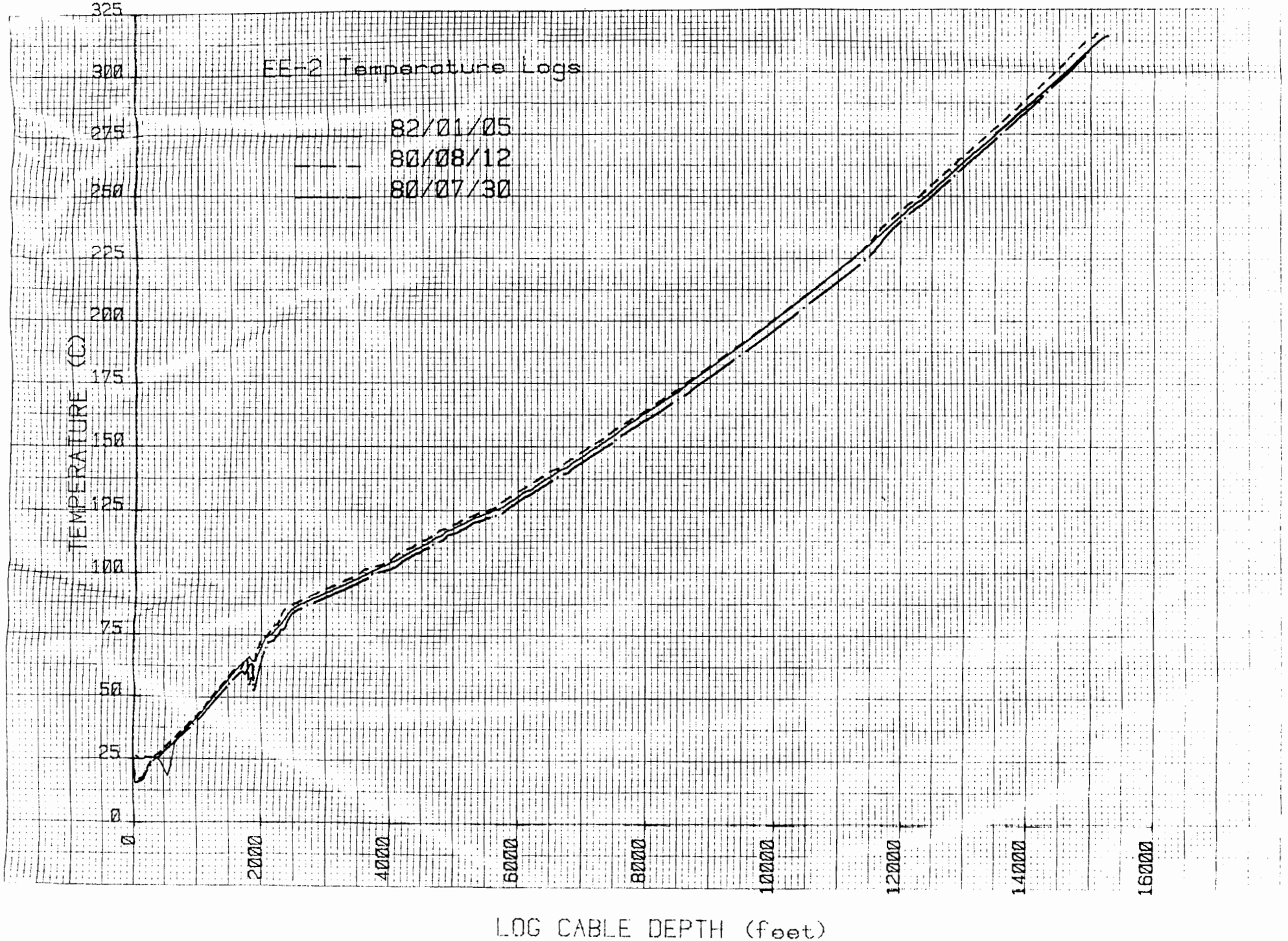
10/2/96

PC-2 Run in with wire line to 1480' and shoot 2, 1/2" holes, fluid in hole fell 500'. Run in with tubing and set retainer at 1400'. Pump 52 sacks of same blend cement. While pumping pressure came up 500# after 20 sacks and air came around cement in 7" X 8 5/8" annulus. Continued pumping 30 more sacks, and pressure started up and got 2 more sacks in before lockup. Pull above retainer and spot 20 sacks. Pull above cement and load hole with viscous 9.1# mud. Lay down tubing to 60', pump 58 sacks to circulate to surface and fill around 10 3/4", hole stayed full. Rig down all equipment, cut anchors and casing below ground level and install well cap. Release rig 10/2/96. (Received approval from Roy Johnson with Oil Conservation Division to plug this way)

Rig 12 hours	
Daily Project Cost	10,054
Cumulative	142,058

10/3/96 Demobilize rig from Fenton HDR site.

Daily Project Cost	4,093
Cumulative	146,151


EE-2 Temperature Logs
82/01/05
80/08/12
80/07/30
TEMPERATURE (C)
325
300
275
250
225
200
175
150
125
100
75
50
25
0
0
2000
4000
6000
8000
10000
12000
14000
16000
LOG CABLE DEPTH (feet)

STATE OF NEW MEXICO
ERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-103
Adopted 10-1-74
Revised 10-1-78

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SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

Federal Land Use Agreement

5. Indicate Type of Lease State ☐ Fee ☐

5.a State Lease No.

Not Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application Permit –" (Form G-101) for Such Proposals.)

ype of well: Geothermal Producer ☐ Temp. Observation ☐ Low-Temp Thermal ☐ Injection/Disposal ☒

7. Unit Agreement Name: Fenton Hill

Name of Operator: Los Alamos National Laboratory

8. Farm or Lease Name:

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

9. Well No.: EE-3

Location of Well
Unit Letter 1,754 Feet From The East Line and 1,420 Feet From

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

10. Field and Pool, or Wildcat

15. Elevation (Show whether DF, RT, GR, etc.): 8,695'

12. County: Sandoval

Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
FORM REMEDIAL WORK ☐	PLUG AND ABANDON ☐	REMEDIAL WORK ☐	ALTERING CASING ☐
PORARILY ABANDON ☐		COMMENCE DRILLING OPNS. ☐	PLUG & ABANDONMENT ☒
OR ALTER CASING ☐	CHANGE PLANS ☐	CASING TEST AND CEMENT JOB ☐	
		OTHER ☐	
THER ☐			

Describe Proposed or completed Operations *(Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any proposed work)* SEE RULE 203.

Unsuccessful in removing seal assembly from PBR. Cut 4-1/2" casing at 8,500' and removed from the well. Set 9-5/8" cement retainer at 8,400' and placed cement plug consisting of 150 sk class H plus 40% silica flour, .25% dispersant, and .71% retarder above retainer. Filled hole with 9.0 #/gal mud. Tagged cement top at 7,886'.
Cut 9-5/8" casing at 4,200' and removed from well. Set 60 sk cement plug, same blend as above through open ended drill pipe at 4,250'. Filled hole with 9.1 #/gal mud. Tagged cement to at 4,150'. Set 13-3/8" retianer at 2,450'. Set cement plug, 80 sk, same blend as above, on top of retainer. Placed cement plug at 1,370-1,470' with 80 sk and cement plug from 70' to surface with 65 sk, same blend.

Operations were completed on 11/27/96.

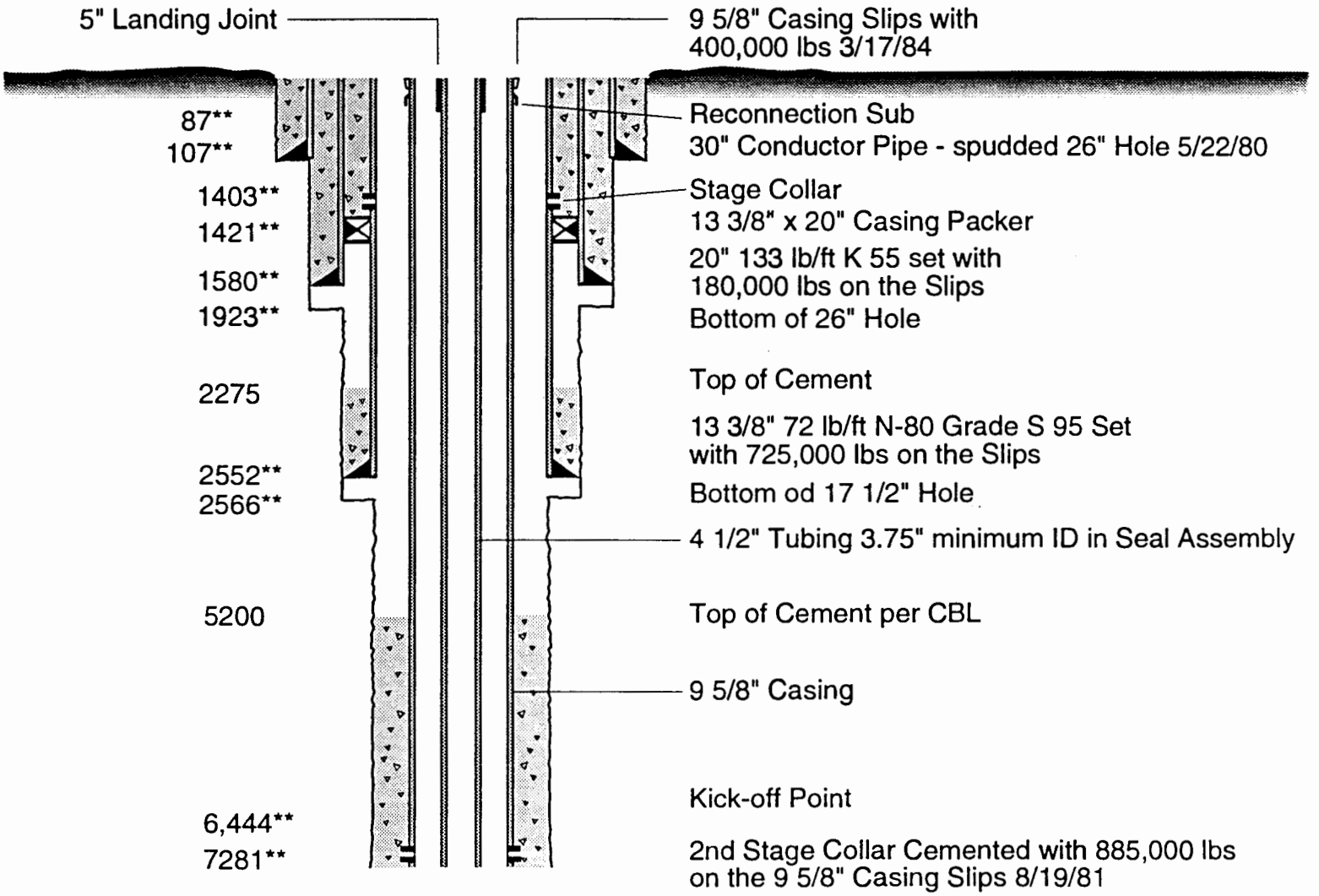
ereby certify that the information above is true and complete to the best of my knowledge and belief.

D _____ TITLE EES-4 Group Leader DATE 1/17/97

VED BY _____ TITLE _____ DATE _____

Present Configuration of EE 3-A

As Completed June 17, 1988
(Drawing revised 4 /15/91, all depths in ft)

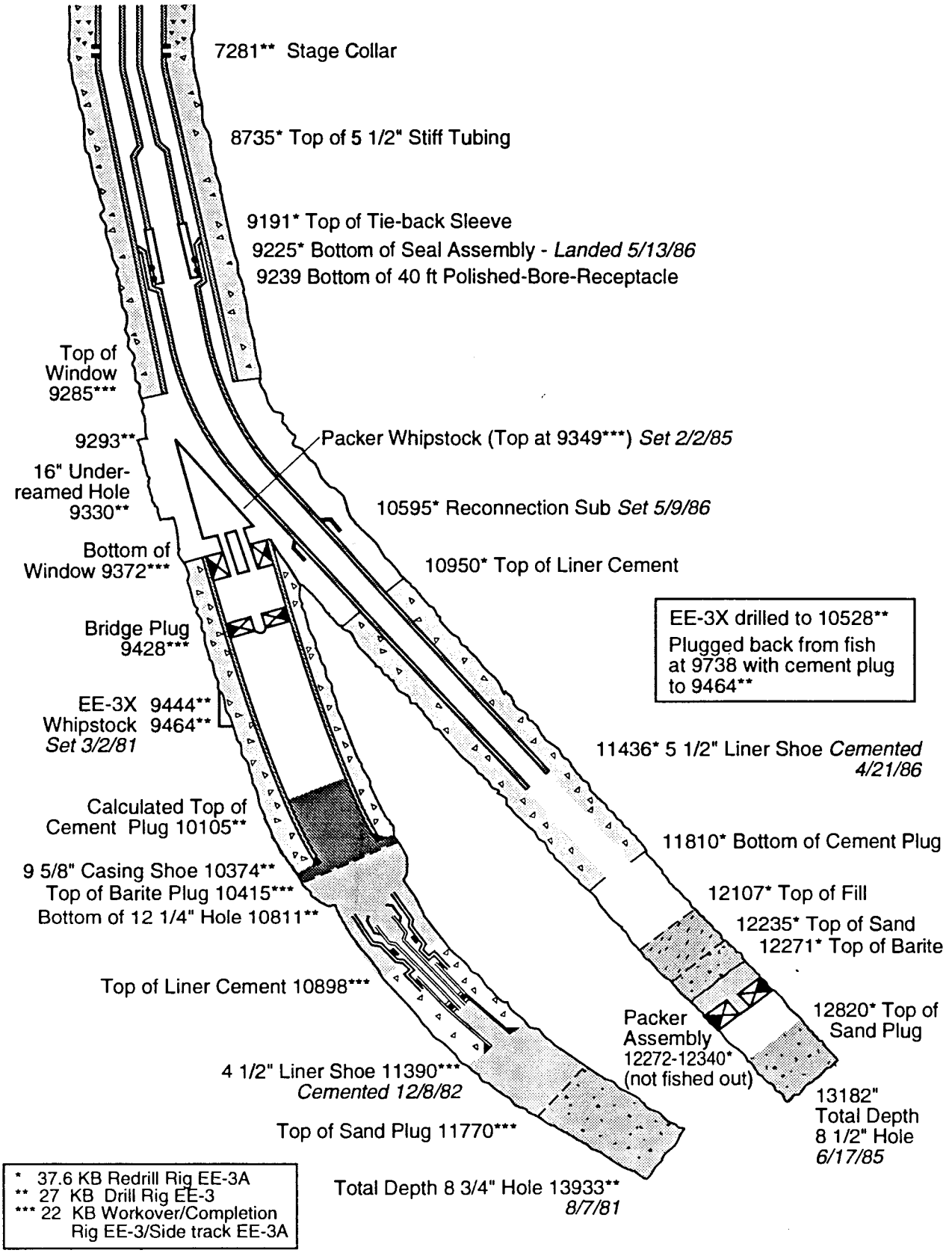


* 37.6 KB Plugback EE-3A
** 27 KB Drill Rig EE-3
*** 22 KB Workover/Completion
Rig EE3-Side track EE-3A

Effective 4/30/92

Present Configuration of EE-3A. Completed by May 14, 1986

(Drawing revised 4/15/91, all depths in ft)



Effective 4/30/92

WELL EE-3A
FIELD PLUG REPORT

10/27/96

Move in, rig up, drill rat & mouse holes, nipple down hanger valves to pull 4 1/2" casing, nipple up 12", 3000# BOP and test to 750 psi.
Casing would not pull free.
Rig up wireline truck and run explosive casing charges at 9,000', 8,600, and successful at 8500'.
Lay down 8,500' of 4 1/2" casing.
Make up 8 1/2" bit and 9 5/8" casing scraper.
Pick up 4 3/4" drill collars, 3 1/2" drill pipe and run in to 8,500' checking for obstructions.
Trip out, lay down scraper and make up 9 5/8" cement retainer.
Trip in with retainer to 8,500' and set.
Pump approximately 150,000 gallons of sump water in hole.
Cement with 150 sacks class "H" plus 40% Silica Flour, plus .25% polymer and .71% retarder.
Set 70 sacks below retainer and 70 sacks above.
Pull 5 stands , mix mud and circulate hole.
Well started flowing, diluted cement and flowed it out.
Trip in with retainer to 8,400' and set.
Water would flow up through retainer but could not pump down through it.
Cement with 150 sacks class "H" plus 40% Silica Flour, plus .25% polymer and .71% retarder above retainer.
Pull 5 stands , mix mud to 45 viscosity, 9,0 lb./gal. and circulate hole.
Trip in and tag top of cement at 7,886'.
Trip out, make up casing cutter and cut casing at 4,200'.
Trip out, weld 1 joint 8 5/8" casing inside 9 5/8" casing , pull and lay down 4,200'.
Trip in with 12 1/4" bit, mix mud to 50 viscosity, 9.1 lb./gal and tag top of cement at '.
Trip out with 26 stands and lay down drill pipe.
Make up 13 3/8" cement retainer, set at 2,450'.
Pump 80 sacks class H plus 40% Silica Flour plus .25% polymer dispersant on top of retainer.
Set plugs at 1,470'- 1,370'with 80 sacks and 70'- surface with 65 sacks.
Clean mud tanks & lines.
Release rig at 0:800 hours 11/27/96.

Sam Harvey
Therma Source, Inc.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-103
Adopted 10-1-74
Revised 10-1-78

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Federal Land Use Agreement

5. Indicate Type of Lease: State ☐ Fee ☐

5.a State Lease No.

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Type of well: Geothermal Producer ☐ Temp. Observation ☐ Low-Temp Thermal ☐ Injection/Disposal ☒

7. Unit Agreement Name: Fenton Hill

Name of Operator: Los Alamos National Laboratory

8. Farm or Lease Name

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

9. Well No.: EE-1

Location of Well: Unit Letter 1,463 Feet From The East Line and 1,501 Feet From The North Line, Section 13 Township 19N Range 2E NMPM.

10. Field and Pool, or Wildcat

15. Elevation (Show whether DF, RT, GR, etc.): 8,695'

12. County: Sandoval

Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

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PORARILY ABANDON ☐		COMMENCE DRILLING OPNS. ☐	PLUG & ABANDONMENT ☒
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		OTHER ☐	
THER ☐			

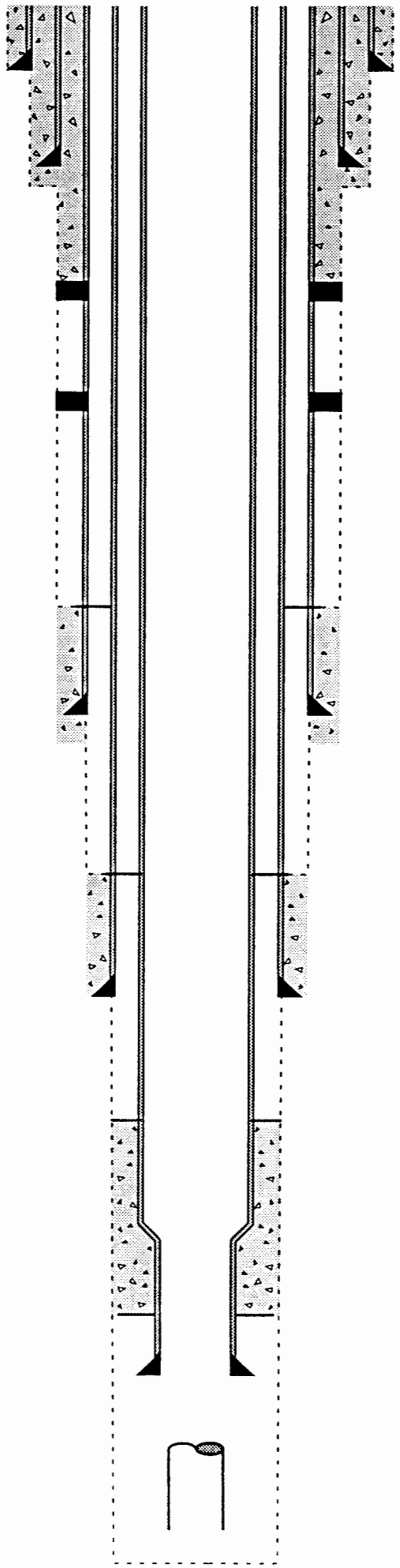
Describe Proposed or completed Operations *(Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any proposed work)* SEE RULE 203.

Set 7-5/8" cement retainer at 8,800' and placed cement plug consisting of 150 sk class H plus 40% silica flour, .25% dispersant, and 1.15% retarder below retainer. Stung out of retainer and placed 40 sk plug, same blend as above, on top of retainer. Filled hole with mud. Tagged cement top at 8,590'. Cut 8-5/8" casing at 6,500' and removed from well. Ran cement bond log in 10-3/4" casing to 500' and verified cement in 10-3/4" x 13-3/8" annulus. Set 10-3/4" retainer at 6,300' and placed 110 sk class H plus 40% silica flour above retainer. Filled hole with mud. Tagged cement top at 6,178'. Set cement plugs in 10-3/4" casing at 4,300'-4,100', 2,300'-2,100' and 70' to surface. Cut off wellhead, welded plate with identification markings on casing top, and levelled location.

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

SIGNED James L. Gunderson TITLE EES-4 Group Leader DATE 1/17/97

APPROVED BY TITLE DATE



KB Depths

25 ft

270 ft

580 ft

600 ft

790 ft

1783 ft

1905 ft

2100 ft

2401 ft

2431 ft

2600 ft

3350 ft

4640 ft

6420 ft

7700 ft

7936 ft

8600 ft

9020 ft

9599 ft

9747 ft

10,053 ft

KB 8711 ft - GL 8696 ft
48" hole drilled to 10' GL
30" culvert SA 10' GL with 10 yards concrete

10 3/4" casing parted at 270' - cemented four times with a total of 500 sacks

20" 94# H-40 BT&C casing SA 580' with 830 ft^3 cement

26 1/2" hole drilled to 600'

13 3/8" stage collar

Wellbore Diagram for EE-1 9-22-81

13 3/8" stage collar cemented without returns
Cement lost to LC zone

Lost circulation zone in 17 1/2" hole

Calculated top of cement on first stage recementing of 13 3/8" casing

Top of Precambrian

13 3/8" 54.5# k-55 ST&C casing SA 2432" with 225 sacks of cement on recementing
17 1/2" hole drilled to 2600'

Lost circulation zone in 12 1/4" hole

Top of cement per CBL on cementing of 10 3/4" casing

10 3/4" 45.5# K-55 BT&C casing SA 6420 with 300 ft^3 cement

Top of cement per CBL at 7700' on cementing of of 8 5/8x7 5/8"casing

Lost circulation zone in 9 7/8" hole

Bottom of 8 5/8" 32# k-55 LT&C casing
Top of 7 5/8" 26.4# N-80 Hydril casing

Bottom of cement per CBL at 9020'

7 5/8" 26.4# N-80 Hydril casing SA 9599' with 240 ft^3 and recemented with 180 ft^3

Top of fish (5 1/2" casing and inflatable packers)

TD of 9 5/8" hole (cleaned out with 6 3/4' bit)

WELL EE-1
FIELD PLUG REPORT

10/27/96

Move in, rig up, drill rat & mouse holes, nipple up 12", 3000# BOP and test to 750 psi.
Make up 6 3/4" bit and 7 5/8" casing scraper.
Pick up 4 3/4" drill collars, 3 1/2" drill pipe and run in to 9,600' checking for obstructions.
Trip out, lay down scraper and make up 7 5/8" cement retainer.
Trip in with retainer to 8,800' and set.
Pump approximately 680,000 gallons of sump water in hole.
Cement with 150 sacks class "H" plus 40% Silica Flour, .25% polymer and 1.15% retarder below retainer.
Sting out of retainer and dump 40 sacks on top.
Pull 5 stands , mix mud and circulate hole. Trip in and tag top of cement at 8,590'.
Trip out, make up casing cutter and cut casing at 6,500'.
Trip out, make up casing spear, pull and lay down 6,500' 8 5/8" casing.
Make up 9 7/8" bit and casing scraper and round trip to 6,500' scraping casing.
Run Cement Bond Log, 10 3/4" casing is cemented to 13 3/8" casing.
Make up 10 3/4" cement retainer, set at 6,300'.
Cement with 110 sacks below retainer, sting out and dump 40 sacks on top.
Pull 5 stands , mix mud and circulate hole.
Trip in and tag top of cement at 6,178'.
Set plugs at 4,300'- 4,100', 74 sacks inside 10 3/4", at 2,300'- 2,100', 75 sacks inside 10 3/4" and 70'- 0, 50 sacks inside 10 3/4".
Nipple down and pump excess mud to frac tanks.
Release rig to move at 1200 hours 11/8/96.

Sam Harvey
Therma Source, Inc.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-103
Adopted 10-1-74
Revised 10-1-78

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SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

Federal Land Use Agreement

5. Indicate Type of Lease: State ☐ Fee ☐

5.a State Lease No.

(Do Not Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application for Permit —" (Form G-101) for Such Proposals.)

Type of well: Geothermal Producer XX ☐ Temp. Observation ☐ Low-Temp Thermal ☐ Injection/Disposal ☐

7. Unit Agreement Name: Fenton Hill

Name of Operator: Los Alamos National Laboratory

8. Farm or Lease Name:

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

9. Well No.: GT-2

Location of Well: Unit Letter 1,525 Feet From The East Line and 1,747 Feet From the North Line, Section 13 Township 19N Range 2E NMPM.

10. Field and Pool, or Wildcat

15. Elevation (Show whether DF, RT, GR, etc.): 8,695'

12. County: Sandoval

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 ☐		COMMENCE DRILLING OPNS. ☐	PLUG & ABANDONMENT ☒
PULL OR ALTER CASING ☐	CHANGE PLANS ☐	CASING TEST AND CEMENT JOB ☐	
OTHER ☐		OTHER ☐	

Describe Proposed or completed Operations *(Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any proposed work)* SEE RULE 203.

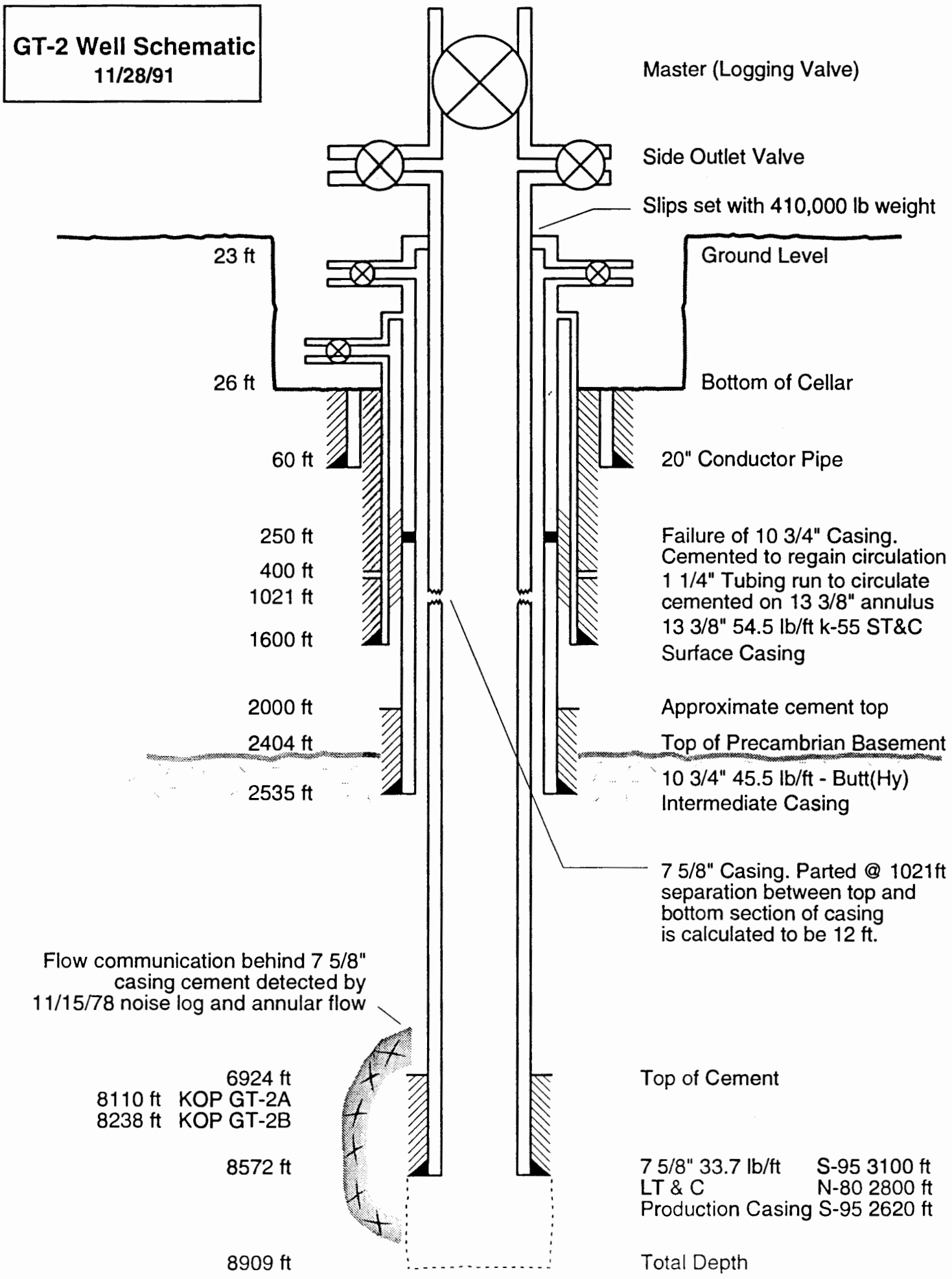
Set 7-5/8" cement retainer at 8,490' and pumped 195 sk class H plus 40% silica flour, .25% dispersant, and 1.15% retarder below retainer. Stung out of retainer and placed 38 sk cement, same blend as above, on top of retainer. Removed 1,012' 7-5/8" casing from above casing part. Speared 7-5/8" casing top, calculated free point at 6,500'. Cut casing at 6,500', then 6,400', the 5,800' before it came free. Removed 5,800' 7-5/8" casing from the well. Tagged cement top at 8,290'. Set class H cement plugs with 40 % silica flour and additives at 6,270'-6,170', 4,270'-4,170', and 2,585'-2,485'. Set 10-3/4" retainer at 2,480' and set cement plugs, same mixture as above, at 2,480'-2,280', 1,650'-1,550', and 50' to surface.
Cut off wellhead, welded steel plate with identification markings on casing top and levelled location.

Operations were completed on 10/24/96.

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

SIGNED James A. Gallegher TITLE EES-4 Group Leader DATE 1/17/97

APPROVED BY _____ TITLE _____ DATE _____


GT-2 Well Schematic
11/28/91
Master (Logging Valve)
Side Outlet Valve
Slips set with 410,000 lb weight
23 ft
Ground Level
26 ft
Bottom of Cellar
60 ft
20" Conductor Pipe
250 ft
400 ft
1021 ft
1600 ft
Failure of 10 3/4" Casing.
Cemented to regain circulation
1 1/4" Tubing run to circulate
cemented on 13 3/8" annulus
13 3/8" 54.5 lb/ft k-55 ST&C
Surface Casing
2000 ft
Approximate cement top
2404 ft
Top of Precambrian Basement
2535 ft
10 3/4" 45.5 lb/ft - Butt(Hy)
Intermediate Casing
7 5/8" Casing. Parted @ 1021ft
separation between top and
bottom section of casing
is calculated to be 12 ft.
Flow communication behind 7 5/8"
casing cement detected by
11/15/78 noise log and annular flow
6924 ft
Top of Cement
8110 ft KOP GT-2A
8238 ft KOP GT-2B
8572 ft
7 5/8" 33.7 lb/ft S-95 3100 ft
LT & C N-80 2800 ft
Production Casing S-95 2620 ft
8909 ft
Total Depth

WELL GT-2
FIELD PLUG REPORT

10/15/96

Move in, rig up, drill rat & mouse holes, nipple up 12", 3000# BOP and test to 750 psi.
Make up 6 1/2" bit and 7 5/8" casing scraper.
Pick up 4 3/4" drill collars, 3 1/2" drill pipe and run in to 8,500' checking for obstructions.
Trip out, lay down scraper and make up 7 5/8" cement retainer.
Trip in with retainer to 8490' and set.
Cement with 195 sacks (63 bbls) class "H" plus 40% Silica Flour, .25% polymer and 1.15% retarder below retainer.
Displaced with 50.5 bbls water before pressuring up to 2200#.
Sting out of retainer and dump 12.5 bbls (38 sacks) on top.
Trip out, make up casing spear, pull and lay down 1012' 7 5/8" casing.
Pick up 4 1/2" drill pipe and run in with spear.
Work casing to calculate free point, estimate free at 6500'.
Cut casing at 6500' and 6460', casing would not come.
Re-cut casing at 5800' and lay it down.
Make up 9 7/8" bit and casing scraper and round trip to 2500' scraping casing.
Trip in open ended with 3 1/2" drill pipe and tag cement at 8290'.
Lay down drill pipe and set plugs at 6270', 18 sack (100' coverage) plug inside 7 5/8" casing, 4270, 45 sack (100' coverage) plug inside 9 7/8" hole and 2585', 18 sack (100' coverage) plug inside 9 7/8" hole.
Make up 10 3/4" cement retainer, set at 2480' and set plugs at 2480'-2280', 90 sacks inside 10 3/4", at 1650'-1550', 45 sacks inside 10 3/4" and 50'-0 16 sacks inside 10 3/4".
Nipple down and pump excess mud to frac tanks.
Release rig to move at 1800 hours 10/23/96.

Sam Harvey
Therma Source, Inc.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

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OIL CONSERVATION DIVISION

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SANTA FE, NEW MEXICO 87501

Form G-103
Adopted 10-1-74
Revised 10-1-78

SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

Federal land use agreement

5. Indicate Type of Lease: State ☐ Fee ☐

5.a State Lease No.

o Not Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application or Permit –" (Form G-101) for Such Proposals.)

Type of well: Geothermal Producer ☐ Temp. Observation ☐ Low-Temp Thermal ☐ Injection/Disposal ☒

7. Unit Agreement Name: Fenton Hill

Name of Operator: Los Alamos National Laboratory

8. Farm or Lease Name:

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

9. Well No.: GT-1

Location of Well
Unit Letter 403 Feet From The East Line and 1,253 Feet From
The South Line, Section 1 Township 19N Range 2E NMPM.

10. Field and Pool, or Wildcat

15. Elevation (Show whether DF, RT, GR, etc.): 8,451'

12. County: Sandoval

Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:

RFORM REMEDIAL WORK ☐ PLUG AND ABANDON ☐
MPORARILY ABANDON ☐
'LL OR ALTER CASING ☐ CHANGE PLANS ☐
OTHER ☐

SUBSEQUENT REPORT OF:

REMEDIAL WORK ☐ ALTERING CASING ☐
COMMENCE DRILLING OPNS. ☐ PLUG & ABANDONMENT ☒
CASING TEST AND CEMENT JOB ☐
OTHER ☐

Describe Proposed or completed Operations *(Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any proposed work)* SEE RULE 203.

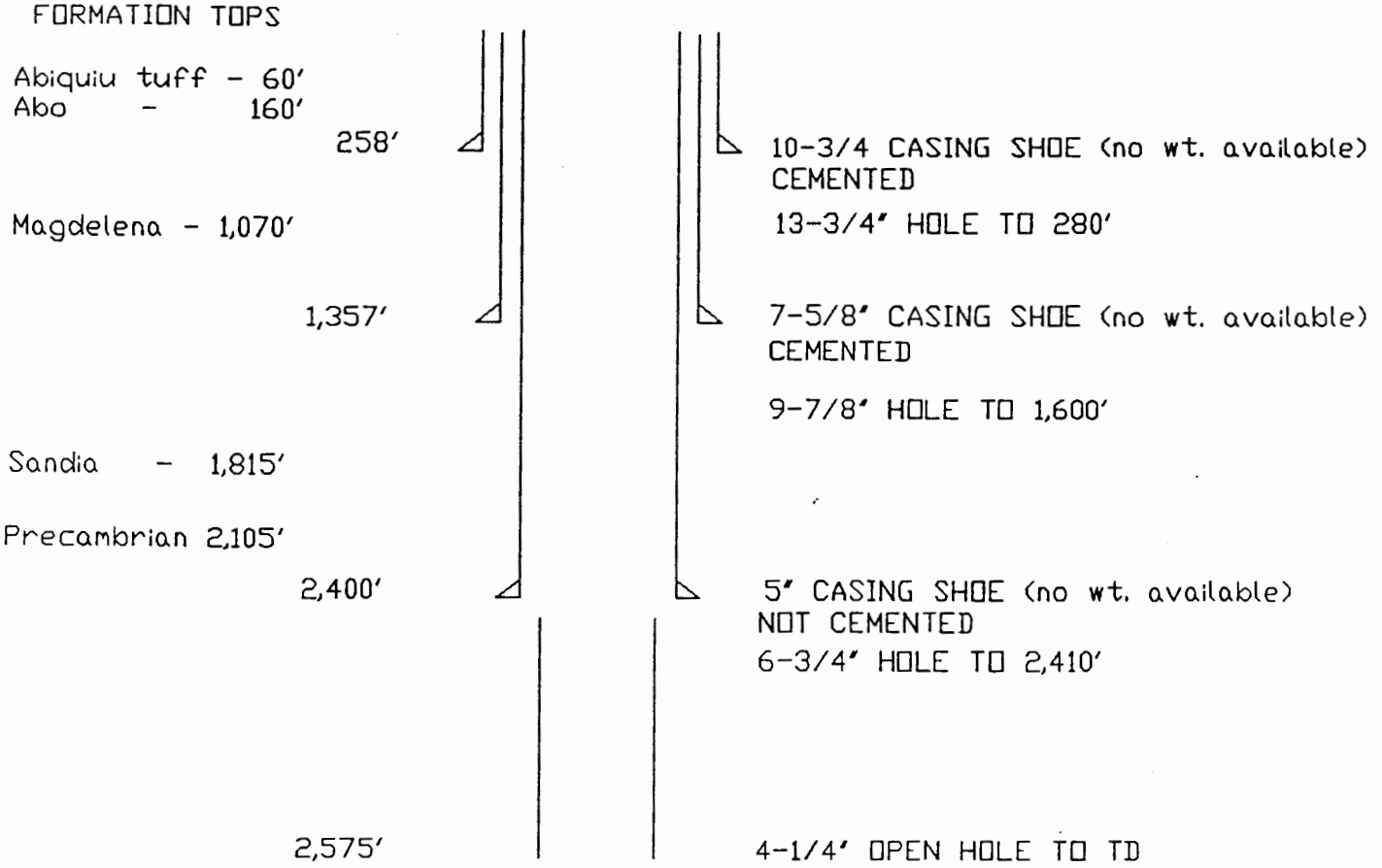
Attempted to remove 5" casing. Would not come free with 120,000#.
Set 5" retainer at 2,300'. Could not pump through retainer. Stung out and placed 9sk class H plus 40% silica flour and 1/4#/sk Flow Seal on top of retainer (100+ linear ft) Cut 5" casing at 1,400' and removed from well. Pumped 40 sk cement blend same as above through open ended pipe at 1,420'. Filled hole with 9.2 #/gal mud. Tagged cement top at 1,222'. Cemented from 110' to surface with 30 sk cement, same blend as above. Cut off wellhead and welded steel plate with identification markings on casing top. Operations were completed on 9/27/96.

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

NED [signature] TITLE EES-4 Group Leader DATE 1/17/97

GT-1 WELLBORE SCHEMATIC

5/29/96



Notes: Although not documented, the 10-3/4" and 7-5/8" casing strings were probably only cemented a few feet at the bottom, but there may have been cement poured behind the casing.

WELL COMPLETED 6/30/72
LOCATED IN BARLEY CNYN

- STATE OF NEW MEXICO
ERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-103
Adopted 10-1-74
Revised 10-1-78

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SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

Federal Land Use Agreement

5. Indicate Type of Lease State ☐ Fee ☐

5.a State Lease No.

Not Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application Permit –" (Form G-101) for Such Proposals.)

7. Unit Agreement Name: Fenton Hill

Type of well: Geothermal Producer ☐ Temp. Observation XX Low-Temp Thermal ☐ Injection/Disposal ☐

Name of Operator: Los Alamos National Laboratory

8. Farm or Lease Name

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

9. Well No.: PC-1

Location of Well
Unit Letter 1,966 Feet From The West Line and 3,048 Feet From
The North Line, Section 18 Township 19N Range 3E NMPM.

10. Field and Pool, or Wildcat

15. Elevation (*Show whether DF, RT, GR, etc.*) 8,400'

12. County: Sandoval

Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
FORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
PORARILY ABANDON	☐			COMMENCE DRILLING OPNS.	☐	PLUG & ABANDONMENT	X
. OR ALTER CASING	☐	CHANGE PLANS	☐	CASING TEST AND CEMENT JOB	☐		
				OTHER			☐
THER	☐						

Describe Proposed or completed Operations *(Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any proposed work)* SEE RULE 203.

Cut 4-1/2" casing at 1,300' and removed from the well. Cleaned out 7" casing to 1,250', ran 7" cement retainer which set prematurely at 1,005'. Cut 7" casing at 980', 780', and 580' but could not pull free. Cut 7" casing at 100' and removed from well. 7" x 8-5/8" annulus had been cemented and not documented when the well was drilled. Placed 40 sk class H plus 40% silica flour and 1/4 #/sk Flow Seal on top of retainer at 1,005'. Filled hole with mud. Tagged cement top at 974'. Set 20 sk plug, same blend as above, on top of previous plug. Hole stayed full. Pumped 20 sk plug, same blend as above, across cut at 580' through open ended pipe at 650'. Set 8-5/8" retainer at 90'. Squeezed 64 sk cement, same blend as above, and circulated to surface through 8-5/8" x 10-3/4" annulus. Stung out of retainer and cemented to surface. Cut off wellhead, welded steel plate with identification markings to casing top. Operations were completed on 10/1/96.

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

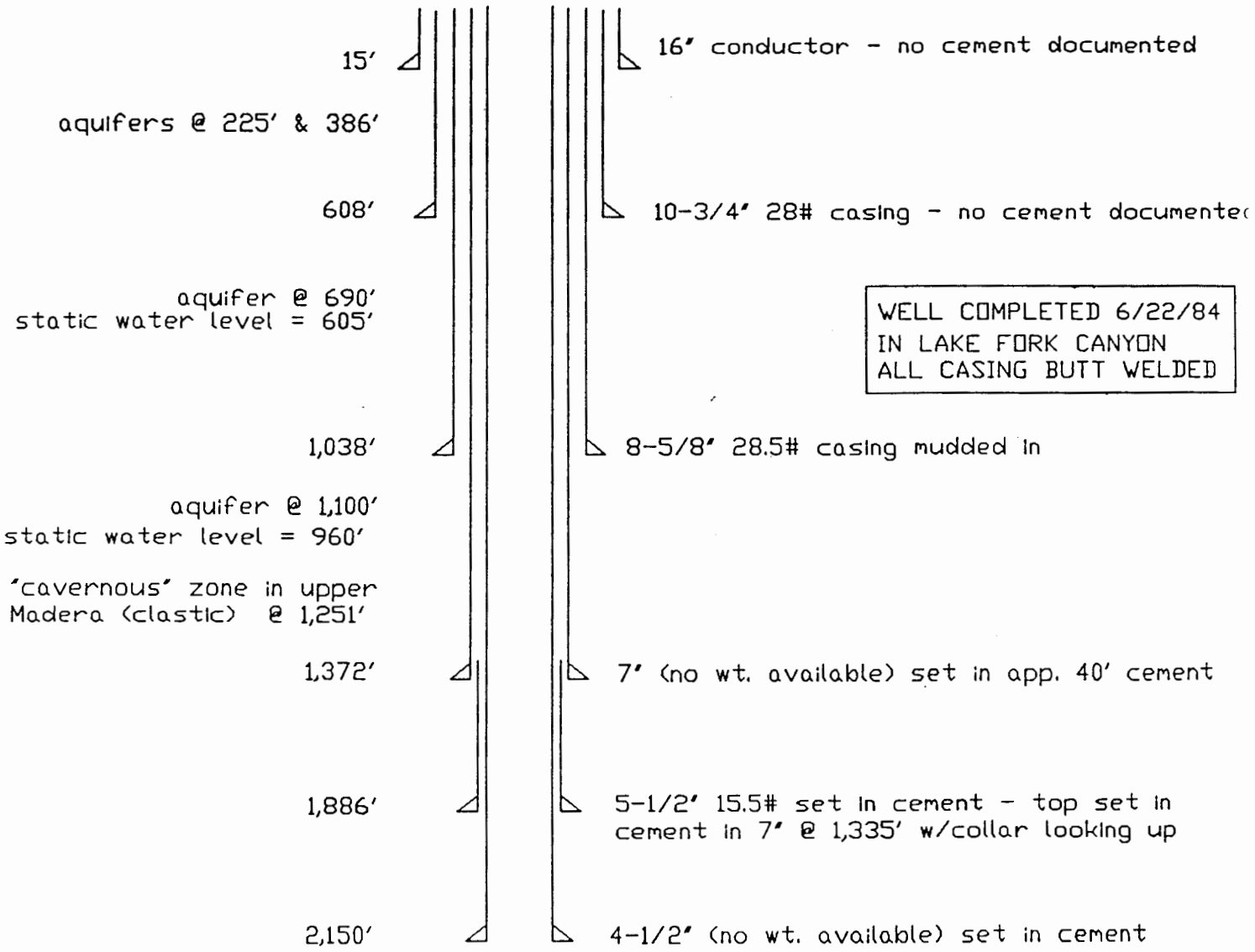
D James A. Albright TITLE EES-4 Group Leader DATE 1/17/97

VED BY _____ TITLE _____ DATE _____

PC-1 WELLBORE SCHEMATIC

5/17/96

DATA DERIVED FROM D.MILES DAILY REPORTS



TOTAL DEPTH = 2,178' IN PRECAMBRIAN
DRILLING ASSY WAS LEFT ON BOTTOM

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-103
Adopted 10-1-74
Revised 10-1-78

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SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

Federal Land Use Agreement

5. Indicate Type of Lease: State ☐ Fee ☐

5.a State Lease No.

(Do Not Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application for Permit —" (Form G-101) for Such Proposals.)

Type of well: Geothermal Producer ☐ Temp. Observation ☒ Low-Temp Thermal ☐ Injection/Disposal ☐

7. Unit Agreement Name: Fenton Hill

Name of Operator: Los Alamos National Laboratory

8. Farm or Lease Name:

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

9. Well No.: PC-2

Location of Well: Unit Letter ____ 4,458 ____ Feet From The East Line and 3,038 Feet From the North Line, Section 13 Township 19N Range 2E NMPM.

10. Field and Pool, or Wildcat

15. Elevation (Show whether DF, RT, GR, etc.): 8,635'

12. County: Sandoval

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 ☐		COMMENCE DRILLING OPNS. ☐	PLUG & ABANDONMENT ☒
PULL OR ALTER CASING ☐	CHANGE PLANS ☐	CASING TEST AND CEMENT JOB ☐	
OTHER ☐		OTHER ☐	

Describe Proposed or completed Operations *(Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any proposed work)* SEE RULE 203.

Perforated 7" casing at 1,750'. Set 7" cement retainer at 1,700', filled hole with water, pumped 186 sk class H plus 40% silica flour and 1/4#/sk Flow Seal below retainer. Stung out of retainer and placed 20 sk cement of same blend on top of retainer. Perforated 7" casing at 1,480'. Set 7" retainer at 1,400' and pumped 52 sk cement plug, same blend as above, below retainer. Circulated cement out 7" x 8-5/8" annulus. Stung out of retainer and set 20 sk cement plug, same blend as above, on top of retainer. Filled hle with 9.1 #/gal mud. Set cement plug from 60' to surface. Cut off wellhead, and welded steel plate with well identification on casing top.

Operations were completed on 10/2/96.

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

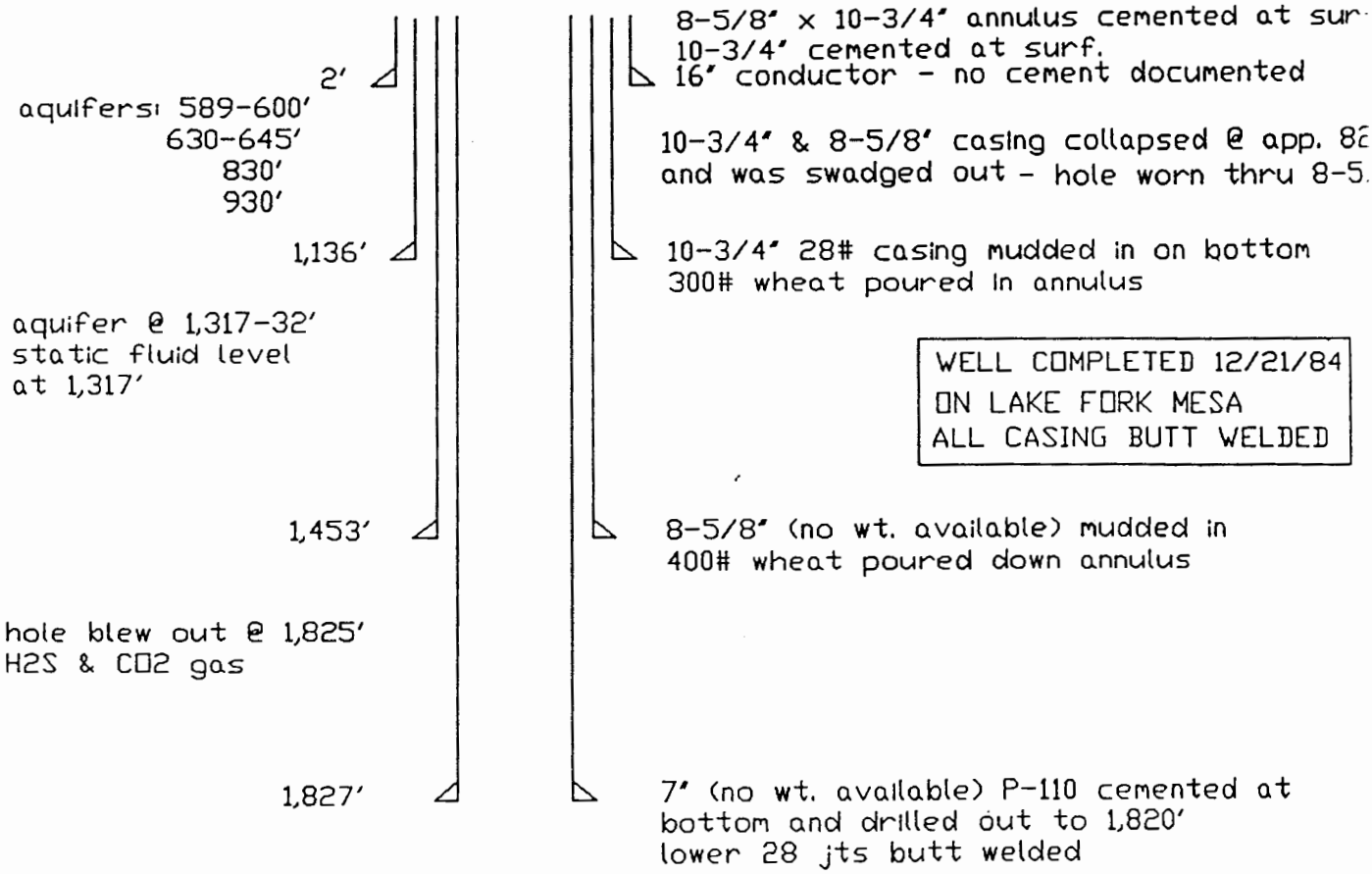
SIGNED [signature] TITLE EES-4 Group Leader DATE 1/17/97

APPROVED BY ____ TITLE ____ DATE ____

PC-2 WELLBORE SCHEMATIC

5/17/96

DATA DERIVED FROM D.MILES DAILY REPORTS



FENTON HILL HOT DRY ROCK PROJECT
Daily Well Abandonment Activity

9/9/96 Move in rig and equipment to main project site.

Daily Project Cost	3,393
Cumulative	6,113

Well THC

9/10/96 Move equipment to well site and rig up to pull 4 1/2" casing. Pulled up to 60,000# over estimated string weight. Pipe stretch indicated was stuck 520-580 feet deep. Records showed a formation change at 580 foot. Rigged up wireline truck and ran in hole to 52 with casing caliper, pulled caliper, run explosive casing shot to 500' and shot casing apart. Laid down 500', 15 joints and cutoff.
Set rig anchors on THA, THB, THC, THD, GT1, PC1 and PC2
Shut down for day .

Rig 12 hours	
Daily Project Cost	7,904
Cumulative	14,017

9/11/96 Pick up 2 3/8" tubing and run in hole to 650', set down solid. Pump 15 barrels fresh water to fill hole. Cement from 650' (120' Inside casing stub) to surface. Pumped 128 sacks Class H premium cement blended with 40% Silica Flour with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack. Circulated while cementing and had good cement to surface. While laying down tubing, cement fell back 100'. Pumped 20 sacks of same blend cement to fill hole. Cement falling back slowly (10' in 1/2 hour), top off with 4 sacks hole stayed full.
Rig down equipment.

Well THB

Move in rig and rig up equipment and spear into 4 1/2" casing. Pulled 60,000 # and casing came free. Laydown 17 joints 650', 4 1/2" casing. Pickup 2 3/8" tubing to 650'. Load hole with 12 bbls fresh water. Cement from 650' to 300' with 45 sacks blended with 40% Silica Flour and 3% Calcium Chloride with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack. Circulated out fresh water while cementing.
Shut down for day.

Rig 12. 5 hours	
Daily Project Cost	9,869
Cumulative	23,886

9/12/96 Run in hole and tag cement top at 415'. Rig up to cement and pump 80 sacks Class H premium cement blended with 40% Silica Flour with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack. Circulated while cementing and had good cement to surface. Lay down tubing. Cement falling back, wait 3 hours and tag cement top at 85'. Pump 32 sacks of same blend cement and fill hole, hole stayed full. Rig down rig and equipment, location to muddy to move.

Rig 9 hours	
Daily Project Cost	6,043
Cumulative	29,869

FENTON HILL HOT DRY ROCK PROJECT
Daily Well Abandonment Activity

9/13/96
Well WW-3

Move in and rig up. Pull and work 16" casing up to 75,000#, stretch indicates pipe stuck at 380'. Rig up wireline and tag bottom at 468' inside casing. Rig down.

WW-2 Move in and rig up to pull casing. Pull and work 16" casing up to 75,000#, string up 4 lines, work casing up to 95,000# casing came loose. Lay down casing and shut down for weekend.

Rig 12 hours	
Daily Project Cost	4,270
Cumulative	34,139

9/16/96 Rig down.

WW-3 Move in and rig up to try to pull casing again. Work casing up to 108,000# would not move. Pump 216 cubic feet sand down 16" casing and 54 cubic feet down annulus, tag sand at 300". Pump 85 sacks Class H premium cement blended with 40% Silica Flour with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack down 16" casing and 25 sacks same blend down annulus. wait on cement to harden to tag top.

WW-2 Pump 270 cubic feet sand down open hole. Rig up wire line and tag top of sand at 350'. Pump 125 sacks Class H premium cement blended with 40% Silica Flour with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack, wait on cement to harden to tag top. Shut down for day.

Rig 9 hours	
Daily Project Cost	10,865
Cumulative	46,204

9/17/96

WW-2 Tag cement top in open hole, at 313' with wire line, pump 120 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack.

WW-3 Tag cement top at 237' inside 16" with wire line, then pumped 42 barrels gel water in to fill pipe for top plug. Because of the extra cement needed on WW-2 pumped additional 70 sacks of same blend cement down annulus. to insure 100' coverage. Rig down

PC-1 Move in and rig up to pull 4 1/2" casing. Run in with 4 1/2" ring gauge on wire line to 1320" checking casing ID. Make up explosive shot and shoot casing at 1300'. Lay down 32 joints and cutoff joint (1300').

Rig 12 hours	
Daily Project Cost	8,744
Cumulative	54,948

9/18/96

WW-2 Rig up wire line truck and tag cement top in open hole at 309', had 4' of cement fill.

WW-3 Rig up pump truck and pumped 56 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack top plug inside 16" from 60' to surface.

PC-1 Dress top of 7" casing and run in with ID gauge, stopped at 860'. Make up 6 1/8" bit and pick up tubing to 1000', tubing stopped. Pump fresh water and clean out 7" casing to 1250'. Pull out of hole and run in with cement retainer, retainer hung up at 1,005' and could not get it loose. Pull out of hole and check stinger, trip in and sting into retainer. Pump through retainer and pressured up to 1,000#, would bleed off 100# per hour.

Rig 12 hours	
Daily Project Cost	5,787
Cumulative	60,735

9/19/96

PC-1 Pull out of hole with tubing, Rig up wire line truck and run explosive casing shot at 980'. Work casing up to 110,000# and torque left and right trying to make it break at cut. Run second explosive casing shot at 780'. Work casing up to 110,000# and torque left and right trying to make it break at cut. Turn 7" casing 1/2 turn to the right and casing bound in 8 5/8' casing and did not lose stretch. Need additional tools on this well. Rig down.

TH-A Move in and rig up to pull 4 1/2" casing.

WW-2 Dumped 324 cubic feet sand down open hole.

WW-3 Dumped 216 cubic feet sand down annulus.

Rig 12 hours	
Daily Project Cost	8,174
Cumulative	68,909

9/20/96

WW-2 Tag top of sand at 187' with wire line truck.

TH-A Pull 78,000# on 4 1/2" casing and it came loose. Lay down 16 joints (590") casing. Pick up tubing and run in to 560'. Rig up pump truck and load hole with 12 barrels water. Pump 50 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1. 56, mixed at 15. 6 lb. /gal using 6. 34 gal/water per sack. Pull out of hole and wait for cement to set. Tag cement at 295'. Pump 13 barrels of 40 viscosity, 9.2# mud in hole and lay down tubing. Started pumping surface plug at 55' and lost returns. Continued pumping and had good cement to surface with 95 sacks of same blend cement, hole stayed full. Start rigging down.

Rig 10 hours	
Daily Project Cost	7,943
Cumulative	76,852

9/23/96

TH-A Rig down.

TH-D Move in and rig up to pull 4 1/2' casing. Pull and work up to 90,000#, casing came loose, lay down 15 1/2 joints (500') casing. Pick up 500' tubing and rig up pump truck. Load hole with 16 barrel fresh water, pump 47 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1. 56, mixed at 15. 6 lb./gal using 6.34 gal/water per sack. Circulated steady while cementing and fluid in hole fell back slowly when finished, WOC.

Rig 12 hours	
Daily Project Cost	6,012
Cumulative	84,064

9/24/96

TH-D Run in hole with tubing and tag top of cement at177'. Pump 10 barrels 40 viscosity, 9.1# gel water in hole. Lay down tubing and pump 24 sacks same blend cement surface plug a 55'. Cement fell back 14', topped off with 4 sacks, installed well cap, cut anchors below ground level and rig down.

GT-1 Move in and rig up to pull 5" casing. Inside of casing is egg shaped and casing spear would not go in, will need different grapples.

Rig 10 hours	
Daily Project Cost	3,587
Cumulative	87,651

9/25/96

GT-1 Make up casing spear and work 5" casing up to 120,000#, would not come free. Make up 4 1/4" bit and pick up tubing to 2300'. Pull out of hole, make up cement retainer, trip in to 2300' and set retainer. Try to pump through retainer, but pressured up to 1,000# and held steady. Pull out of retainer and pump 9 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1.56, mixed at 15. 6 lb./gal using 6.34 gal/water per sack, 100'+ coverage. Stand back 1250' tubing and lay the rest down. Rig up wire line truck and run explosive casing cutter at 1400'. Lay down 44 joints and cut off joint of 5" casing.

Rig 12 hours	
Daily Project Cost	7,349
Cumulative	95,000

9/26/96

GT-1 Trip in open ended with tubing to 1420'. Pump 40 Sacks same blend cement to cover 30(circulated while cementing and hole stayed full. Pull up to 1000' and WOC. Trip in with tubing and tag cement at 1222'. Pump hole full of 43 viscosity, 9.2# mud. Lay down tubing to 110'. Pump 30 sacks same blend cement and circulated good cement. Lay dow tubing and cut off well head assembly. Cement falling back very slow, will top off tomorrow. Rig down

PC-1 Move in and start rigging up.

Rig 12 hours	
Daily Project Cost	6,301
Cumulative	101,301

9/27/96

GT-1 Topped cement off with 20 sacks, hole stayed full.

PC-1 Rig up to pull 7" casing with spear, jar and pull casing up to 125,000#, stretch indicates stuck at 620'. Rig up wire line and shoot explosive casing cutter at 580'. Work casing up to 125,000# and try to rotate, would not come free. Shoot explosive casing cutter at 100' lost cable head and collar locator in hole. Work casing up to 80,000# casing started moving. Lay down casing and break down fishing tools. Cement has been poured down annulus and casing showed cement on all that was laid down.

Rig 12.5 hours	
Daily Project Cost	7,306
Cumulative	108,607

9/30/96

PC-1 Trip in to 100' with 7 7/8" bit to clean out cement and pull out. Trip in open ended to 1004 to retainer. Pump 40 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1. 56, mixed at 15.6 lb./gal using 6.34 gal/water per sack. Pull above cement and fill hole with mud and WOC. Tag cement at 974', cement went out hole where pipe was cut. Pump 20 sacks same blend cement, hole stayed full. Pull up to 650', pump 20 sacks cement across cut at 580' and down tubing. Pick up 8 5/8" retainer and run in to 90'. Squeeze 64 sacks cement through retainer until came to surface between 8 5/8" and 10 3/4" casing. Pull out of retainer and pump 30 sacks circulating good cement to surface inside 8 5/8" and some down 16". I telephoned Roy Johnson with OCD and received approval to plug this well this way and PC-2 by perforating and squeezing.

WW-2 Dump 9 yards ready mix cement and fill hole full.

Rig 12.5 hours	
Daily Project Cost	10,075
Cumulative	119,882

10/1/96

PC-1 Cement fell between 10 3/4" and 16" casing, Pump 25 sacks and hole stayed full rig down Cut anchors below ground level and install well cap. Release rig 10/1/96.

PC-2 Move in and rig up. Fill 7" casing with water. Rig up wire line truck and run 7" casing ID gauge 1770. Run perforating gun on wire line to 1750' and shoot 2, 1/2" holes in 7" casing and well went on vacuum. Run in with cement retainer to 1700' and set, load hole with 50 barrels water. Sting back in and pump 186 sacks Class H premium cement blended with 40% Silica Flour and 1/4# per sack Flow Seal with yield of 1. 56, mixed at 15.6 lb./gal using 6.34 gal/water per sack, started pressuring up on last20 sacks. Sting out, pump 20 sacks of same blend cement on top of retainer and trip out.

Rig 13 hours	
Daily Project Cost	12,122
Cumulative	132,004

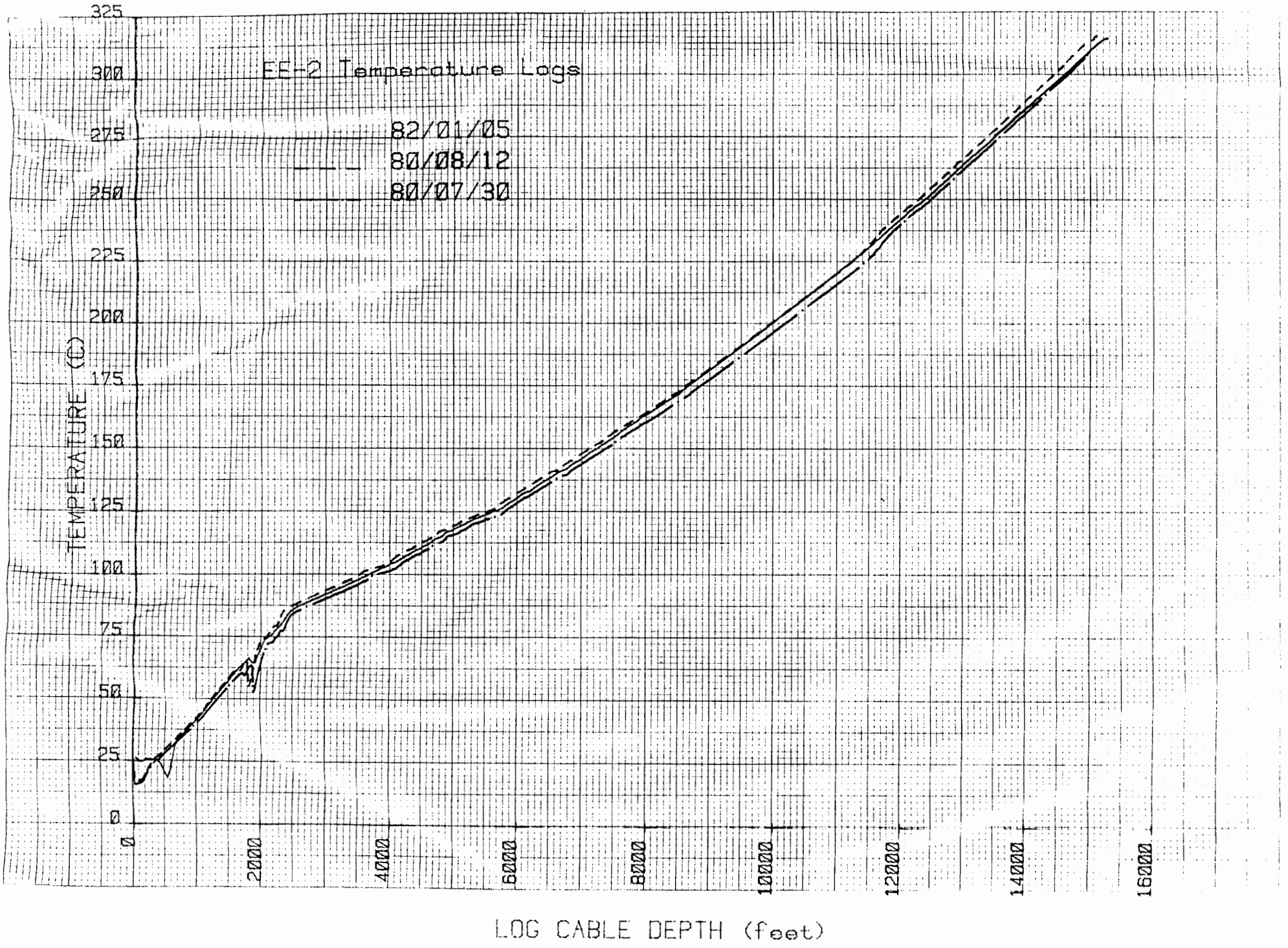
10/2/96

PC-2 Run in with wire line to 1480' and shoot 2, 1/2" holes, fluid in hole fell 500'. Run in with tubing and set retainer at 1400'. Pump 52 sacks of same blend cement. While pumping pressure came up 500# after 20 sacks and air came around cement in 7" X 8 5/8" annulus. Continued pumping 30 more sacks, and pressure started up and got 2 more sacks in before lockup. Pull above retainer and spot 20 sacks. Pull above cement and load hole with viscous 9.1# mud. Lay down tubing to 60', pump 58 sacks to circulate to surface and fill around 10 3/4", hole stayed full. Rig down all equipment, cut anchors and casing below ground level and install well cap. Release rig 10/2/96. (Received approval from Roy Johnson with Oil Conservation Division to plug this way)

Rig 12 hours	
Daily Project Cost	10,054
Cumulative	142,058

10/3/96 Demobilize rig from Fenton HDR site.

Daily Project Cost	4,093
Cumulative	146,151


EE-2 Temperature Logs
82/01/05
80/08/12
80/07/30
TEMPERATURE (C)
325
300
275
250
225
200
175
150
125
100
75
50
25
0
0
2000
4000
6000
8000
10000
12000
14000
16000
LOG CABLE DEPTH (feet)

Department of Energy
Albuquerque Operations Office
Los Alamos Area Office
Los Alamos, New Mexico 87544

AUG 5 1996

AUG -7

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Roy Johnson
Senior Petroleum Geologist
District IV Supervisor
New Mexico Oil Conservation Division
2040 Pacheco Street
Santa Fe, NM 87507

Dear Mr. Johnson:

Subject: Repair Procedures for Injection Well EE-3A

Enclosed are the Well Repair Procedures for Los Alamos National Laboratory's (LANL) Fenton Hill Hot Dry Rock Geothermal Project's Injection Well EE-3A. These procedures are being submitted to your agency for review, comment, and approval. Repair of Injection Well EE-3A has been developed as an alternative to plugging and abandonment. Implementation of this alternative is contingent upon completing other P&A operations significantly under budget. As soon as a funding determination has been made, your agency will be notified if Well EE-3A will be plugged and abandoned or repaired.

Questions regarding the enclosed Repair Procedures should be addressed to Bob Beers of LANL's Water Quality and Hydrology Group at 667-7969. Please submit written comments and approvals to me at your earliest convenience.

Sincerely,

Joseph C. Vozella
Assistant Area Manager
Office of Environment and Projects

LAAMEP:3KZ-005

Enclosure

cc w/enclosure:
K. Zamora, AAMEP, LAAO
S. Rae, ESH-18, LANL, MS-K497
J. Albright, EES-4, LANL, MS-D443
K. McAda, EPD, AL

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

2040 S. Pacheco
SANTA FE, NEW MEXICO 87501

Form C-103
Adopted 10-1-74
Revised 10-1-78

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Operator		
Land Office		

SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

Federal Land Use Agreement

5. Indicate Type of Lease: State ☐ Fee ☐

5.a State Lease No.

Do Not Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application For Permit —" (Form G-101) for Such Proposals.)

1. Type of well: Geothermal Producer ☐ Temp. Observation ☐ Low-Temp Thermal ☐ Injection/Disposal ☒

7. Unit Agreement Name: Fenton Hill

2. Name of Operator: Los Alamos National Laboratory

8. Farm or Lease Name

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

9. Well No.: EE-3

4. Location of Well
Unit Letter ____ 1,754 ____ Feet From The East Line and 1,420 Feet From
The North Line, Section 13 Township 19N Range 2E NMPM.

10. Field and Pool, or Wildcat

15. Elevation (Show whether DF, RT, GR, etc.): 8,675'

12. County: Sandoval

16. 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 ☐		COMMENCE DRILLING OPNS. ☐	PLUG & ABANDONMENT
PULL OR ALTER CASING ☒	CHANGE PLANS ☐	CASING TEST AND CEMENT JOB ☐	
OTHER ☐		OTHER	

17. Describe Proposed or completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 203.

Pull 4-1/2" string from PBR at 9,191'. Cement in 9-5/8" x 13-3/8" casing annulus from leak at app. 4,150' to surface. Perforate 5-1/2" liner at 10,900' or deepest free point and squeeze cement 5-1/2" liner in 8-1/2" hole from perfs to PBR. Run 5-1/2" tubing from surface to PBR and cement in to surface through float collar above PBR. Clean hole to total depth.

See attached detailed procedures and casing schematic.

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

SIGNED James A. Allen TITLE Geo Engineering Group Leader DATE 7/25/96

APPROVED BY Roy E. Johnson TITLE DISTRICT SUPERVISOR DATE 11/4/96

CONDITIONS OF APPROVAL, IF ANY:

Los Alamos National Laboratory

Fenton Hill Hot Dry Rock Test Site

Contingency Well Repair Procedure
Well: EE-3A

ThermaSource, Inc.

6-24-96 Revision

Pertinent Well Data

1. EE-3A was originally completed on May 14, 1986.

2. 9-5/8" casing was originally set in the original EE-3 at a total depth of 10,374'. EE-3 was originally drilled to 13,933' on 8-7-81. EE-3 was adequately abandoned and EE-3A was sidetracked through a section cut in the 9-5/8" between 9285' to 9372'. The section was then underreamed to 16" from 9293' to 9330'. Present bottom of 9-5/8" casing at 9285'. 9-5/8" casing is cemented from 9285' up to 5200' using stage collar at 7281'. Top of cement in 9-5/8" casing X 12-1/4" hole is at approximately 5200' based on CBL.

3. Casing leak or hole in the 9-5/8" casing located at approximately 4150'. Pressure up on 9-5/8" casing result with pressure appearing on the 9-5/8" X 13-3/8" annulus.

4. 13-3/8" casing set to total depth of 2552' and cemented from 2552' up to 2275' and from 1421' back to surface using an external casing packer set at 1421' in 20" casing.

5. 20" casing set to total depth of 1580' and cemented from total depth back to surface.

6. 30" conductor pipe set and cemented to a total depth of 87'.

7. 5-1/2" liner from 9191' to 11,436' and cemented from 11,436' up to 10,950'. Combination 4-1/2" (3.75" Minimum I.D.) and 5" tubing tied-back to top of liner at 9191' using polish bore receptacle back to surface.

8. EE-3A was drilled with a 8-1/2" bit to total depth of 13,182 on 6-17-85. Hole was plugged back with barite, packer and sand to 12,107'.

Time	Sequence of Operations
18 hours	1. Rig up on well and nipple up appropriate blow preventer stack. Test stack and complete rig up operations.
12 hours	2. Rig up and pull 4-1/2" tubing and pull same out of hole and lay down same from tie-back sleeve at 9191' .
6 hours	3. Pick up 8-1/2" bit and 9-5/8" casing scrapper. Run in hole with same and check 9-5/8" casing to 9100'. Circulate and condition fluid in hole to mud and spot thick gel pill on top of PBR.
8 hours	4. Pull out of hole with 8-1/2" bit and pick up 9-5/8" casing cement retainer. Run in hole with retainer and set same below suspected casing leak in the 9-5/8" at approximately 4150'. Disengage from retainer and pull above retainer and prepare to repair casing leak.
8 hours	5. Pull out of hole with drill pipe and pick up a squeeze packer and run in hole with same. Set packer above casing leak. Inject water below squeeze packer and establish an injection rate, hopefully to establish circulation to the surface through the 9-5/8" X 13-3/8" annulus. Mix and pump cement into leak to bring cement to the surface of the 9-5/8" X 13-3/8" annulus or until the injection pressure increases to an appropriate squeeze pressure. Open by-pass on squeeze packer or pull out and circulate out excess squeeze cement.
12 hours	6. Wait on cement.
8 hours	7. Drill out cement and pressure test leak. Drill out cement retainer set below leak.
8 hours	8. Run in hole to top of PBR. Circulate and condition mud in hole. Trip out of hole and lay down 8-1/2" bit.

12 hours 9. Pick up 4-1/2" bit on 2-7/8" drill pipe and run in hole with same. Run in to top of fill at 12,107'. Circulate and condition mud in hole from total depth to surface.

8 hours 10. Trip out of hole and pick up Cement Retainer of 5-1/2" liner and run in hole with same. Set retainer at 11,000'. Pull out of hole with setting tool.

12 hours 11. Rig up and run free pipe log and perforate 5-1/2" Liner at approximately 10,900' or at the deepest free point with wireline perforater. Run in hole with squeeze packer at set packer in top of 5-1/2" liner and attempt to circulate through perforations up liner pass PBR. If circulation can be established then circulate to clean 5-1/2" X 8-1/2" hole annulus in preparation for cement. If unable to circulate, release squeeze packer, pull out of hole with same and rerun wireline perforater and perforate pipe 100' higher. Attempt to establish circulation in a similar method as discussed above.

6 hours 12. After circulation has been established then mix and pump cement to fill annulus between the 5-1/2" liner and the 8-1/2" hole from the perforated hole to the top of the PBR. Open by-pass on squeeze packer or pull out and circulate out excess cement.

12 hours 13. Wait on cement.

12 hours 14. Drill out cement and pressure test 5-1/2" liner across perforations. Drill out cement retainer and run to top of fill at 12,107'.

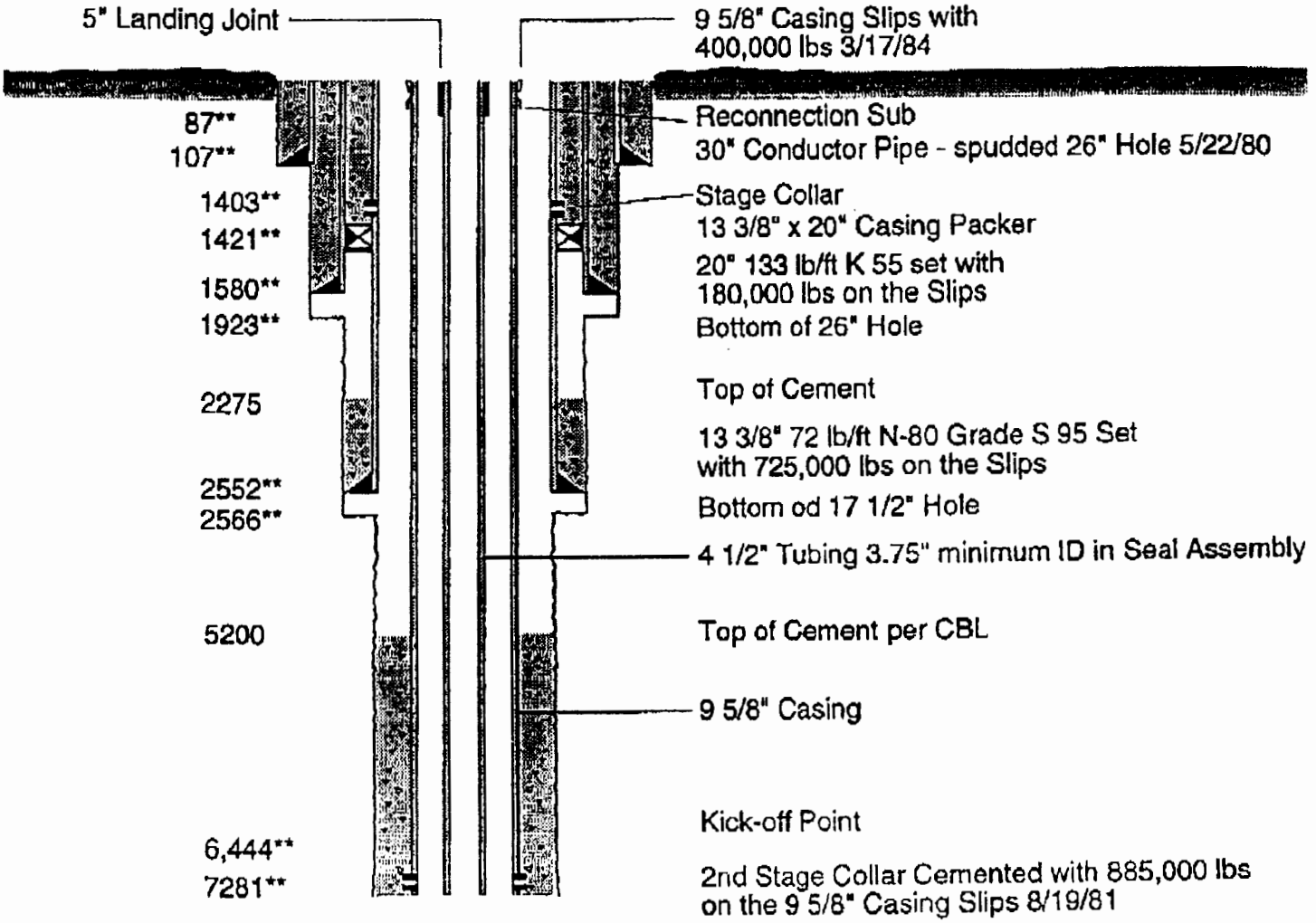
4 hours 15. Circulate and condition mud in hole. Clean out fill to top of packer at 12,271'.

12 hours 16. Pull out of hole with 4-1/2" bit and pick up 2-7/8" tubing with float shoe on bottom and float collar located 80' above bottom. Run liner in hole and hang same from 200' up inside bottom of the 5-1/2" liner at approximately 11,236'. Circulate through tubing and prepare to cement.

6 hours	17. Mix and pump cement through tubing to cement entire length of 2-7/8" tubing from 12,271' up to 11,236'. Leave approximately 150' cement in bottom of tubing. Pull off top of 2-7/8" tubing liner and pull out of hole.
12 hours	18. Wait on cement.
8 hours	19. Run in hole with 4-1/2" bit and drill out excess cement from top of 2-7/8" liner.
12 hours	20. Pressure test lap area to 1000 psi. Trip out of hole and lay down 4-1/2" bit and pick up 1.9" tubing stinger. Run in hole and clean out 2-7/8" tubing.
12 hours	21. Pull out of hole and lay down all drilling tools and equipment.
12 hours	22. Rerun 4-1/2" and 5-1/2" tubing and stab back into PBR. Land tubing in well head security same.
12 hours	23. Rig down and prepare to move rig off location.
12 hours	24. Release rig and move rig off location.
	25. 1-11/16" Geophone to be run to total depth on wireline after rig has been moved off location.

240 hours (10.0 Days) Total Time on Location

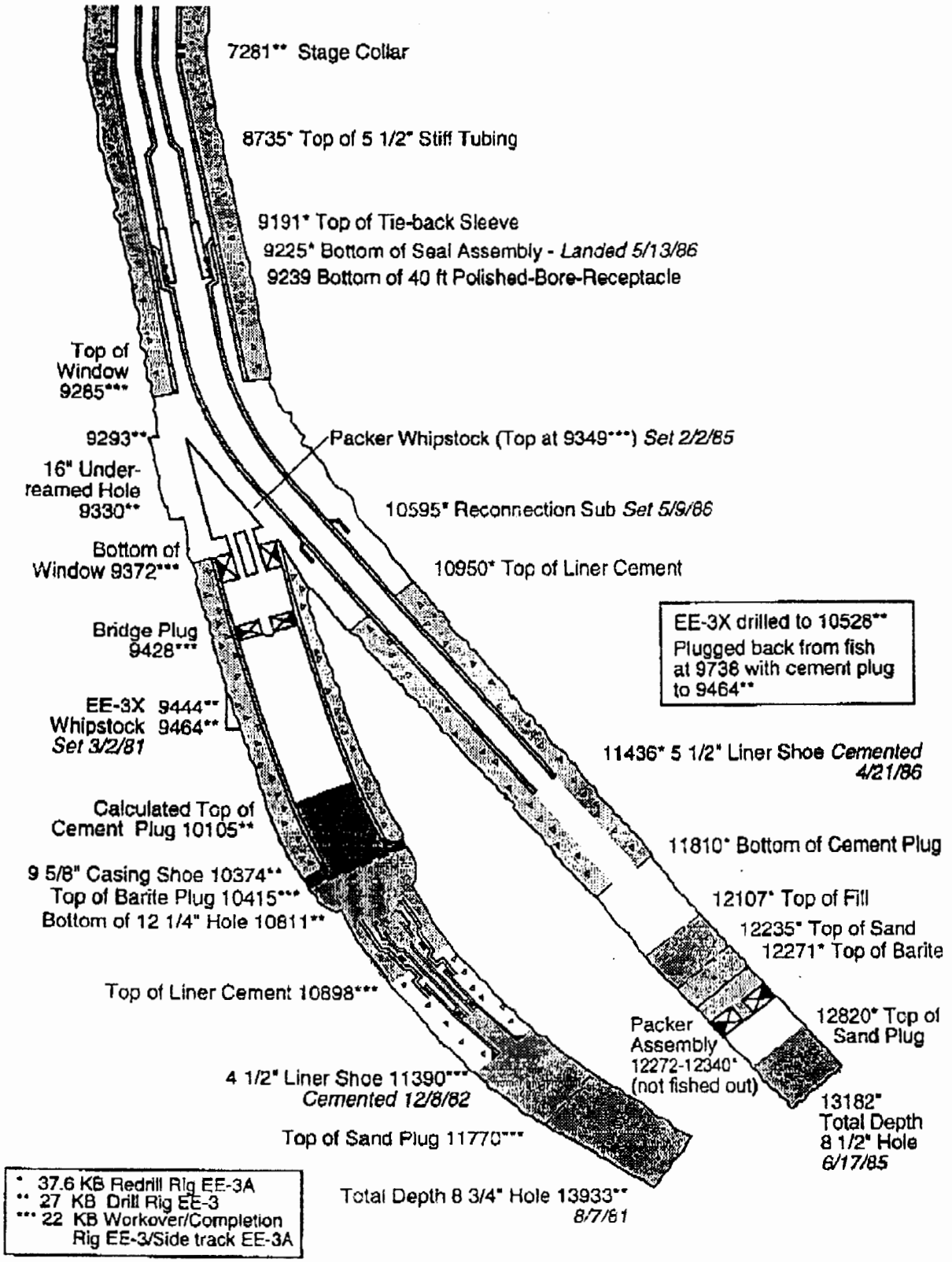
Present Configuration of EE 3-A
As Completed June 17, 1988
(Drawing revised 4 /15/91, all depths in ft)



* 37.6 KB Plugback EE-3A
** 27 KB Drill Rig EE-3
*** 22 KB Workover/Completion Rig EE3-Side track EE-3A

Present Configuration of EE-3A. Completed by May 14, 1986

(Drawing revised 4/15/91, all depths in ft)



Effective 4/30/92

ok

ATTACHMENT 2.A.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
2040 S. Pacheco
SANTA FE, NEW MEXICO 87501

Form G-103
Adopted 10-1-
Revised 10-1-

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SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

Federal Land Use Agreement

5. Indicate Type of Lease State ☐ Fee ☐

5.a State Lease No.

Do Not Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application For Permit –" (Form G-101) for Such Proposals.)

1. Type of well: Geothermal Producer ☐ Temp. Observation ☐ Low-Temp Thermal ☐ Injection/Disposal ☒

7. Unit Agreement Name: Fenton Hill

2. Name of Operator: Los Alamos National Laboratory

8. Farm or Lease Name:

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

9. Well No.: EE-3

4. Location of Well
Unit Letter 1,754 Feet From The East Line and 1,420 Feet From
The North Line, Section 13 Township 19N Range 2E NMPM.

10. Field and Pool, or Wildcat

15. Elevation (Show whether DF, RT, GR, etc.): 8,695'

12. County: Sandoval

16. 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	☐			COMMENCE DRILLING OPNS.	☐	PLUG & ABANDONMEN	
PULL OR ALTER CASING	☐	CHANGE PLANS	☐	CASING TEST AND CEMENT JOB	☐		
OTHER	☐			OTHER			

17. Describe Proposed or completed Operations *(Clearly state all pertinent details, and give pertinenet dates, including estimated date of starting any proposed work)* SEE RULE 203.

Pull 4-1/2" tubing from PBR at 9,191'. Set cement retainer (9-5/8") at 9,100'.
Set cement plug from 9,100' to 8,900'. Fill hole with 30-40 vis. mud. Tag cement top.
Cut 9-5/8" casing at 4,200' and remove (see step 6 of attached prodedure for contingency).
Set cement plug at 4,100-4,200'. Fill hole with 30-40 vis. mud. Tag cement top.
Set 13-3/8" cement retainer at 2,452'. Set 100 linear foot cement plug on top of reatiner.
Set cement plug at 1,371-1,471'. Set 50 linear foot plug at surface. Cut off casing
6' below ground level and weld plate with well name on top. Cover wellhead.
See attached detailed procedures and casing schematic.

It is estimated that this proposed work may start in late July 1996.

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

SIGNED James N. Albright TITLE FOX-4 GROUP LEADER DATE 6/24/96

ATTACHMENT 2.B.

Los Alamos National Laboratory

Fenton Hill Hot Dry Rock Test Site

Preliminary Well Abandonment Procedure
Well: EE-3A

ThermaSource, Inc.

4-2-96 Revision 3

Pertinent Well Data

1. EE-3A was originally completed on May 14, 1986.

2. 9-5/8" casing was originally set in the original EE-3 at a total depth of 10,374'. EE-3 was originally drilled to 13,933' on 8-7-81. EE-3 was adequately abandoned and EE-3A was sidetracked through a section cut in the 9-5/8" between 9285' to 9372'. The section was then underreamed to 16" from 9293' to 9330'. Present bottom of 9-5/8" casing at 9285'. 9-5/8" casing is cemented from 9285' up to 5200' using stage collar at 7281'. Top of cement in 9-5/8" casing X 12-1/4" hole is at approximately 5200' based on CBL.

3. Casing leak or hole in the 9-5/8" casing located at approximately 4150'. Pressure up on 9-5/8" casing result with pressure appearing on the 9-5/8" X 13-3/8" annulus.

4. 13-3/8" casing set to total depth of 2552' and cemented from 2552' up to 2275' and from 1421' back to surface using an external casing packer set at 1421' in 20" casing.

5. 20" casing set to total depth of 1580' and cemented from total depth back to surface.

6. 30" conductor pipe set and cemented to a total depth of 87'.

7. 5-1/2" liner from 9191' to 11,436' and cemented from 11,436' up to 10,950'. Combination 4-1/2" (3.75" Minimum I.D.) and 5" tubing tied-back to top of liner at 9191' using polish bore receptacle back to surface.

8. EE-3A was drilled with a 8-1/2" bit to total depth of 13,182 on 6-17-85. Hole was plugged back with barite, packer and sand to 12,107'.

Time	Sequence of Operations
18 hours	1. Rig up on well and nipple up appropriate blow preventer stack. Test stack and complete rig up operations.
12 hours	2. Rig up and pull 4-1/2" tubing and pull same out of hole and lay down same from tie-back sleeve at 9191' .
6 hours	3. Pick up 8-1/2" bit and 9-5/8" casing scrapper. Run in hole with same and check 9-5/8" casing to 9100'.
8 hours	4. Pull out of hole with 8-1/2" bit and pick up 9-5/8" casing cement retainer. Run in hole with retainer and set same at 9100'. Disengage from retainer and pull above retainer and prepare to set cement plug.
10 hours	5. Mix and pump cement to fill 200 linear feet of 9-5/8" casing from 9100' up to 8900'. Pull out of cement and wait on cement form 8 hours. While waiting on cement mix and fill hole with 30 to 40 vis. gel mud. Tag top of cement to verify proper location of cement.
26 hours	6. Pull out of hole and pick up 9-5/8" casing cutter and cut 9-5/8" casing at approximately 4200'. Pull out of hole and attempt to pull 9-5/8" casing. Pull and lay down 9-5/8" casing. If unable to pull 9-5/8" then run in hole with cement retainer and set same at 4100' approximately 50' above casing leak. Pump below retainer and attempt to establish circulation through the leak and up the annulus of 9-5/8" X 13-3/8" to the surface. If circulation can be established then mix and pump cement to fill 9-5/8" X 13-3/8" annulus up to a free point so that the upper portion of the 9-5/8" can be recovered. Then proceed on with the remainder of the procedures.
12 hours	7. Run in hole with 12-1/4" bit and 13-3/8" casing scrapper. Clean out 13-3/8" casing to 2552' and 12-1/4" open hole to top of 9-5/8" stub at 4200'. Trip out of hole with bit and run in

		hole open ended to top of 9-5/8" stub and set 100 linear open hole cement plug from top of 9-5/8" stub up to 4100' +/-.
12 hours	8.	Wait on cement to set and tag top to verify cement plug is in proper location. Fill hole with good 30 to 40 vis. gel mud.
5 hours	9.	Trip to pick up 13-3/8" casing cement retainer and run in hole with same. Set retainer at 2452'. Disengage from retainer and pull above same and prepare to set cement plug.
3 hours	10.	Mix and pump cement to fill 100 linear feet of 13-3/8" casing from 2452' up to 2352'. Mix and fill hole with 30 to 40 vis gel mud.
2 hours	11.	Set another cement plug from 1471' up to 1371' and another from 50' to surface.
18 hours	12.	Nipple down blow out preventer stack and cut all casing string at ground level. Weld top plate on all casings with well name welded on top.
18 hours	13.	Rig down and release rig.

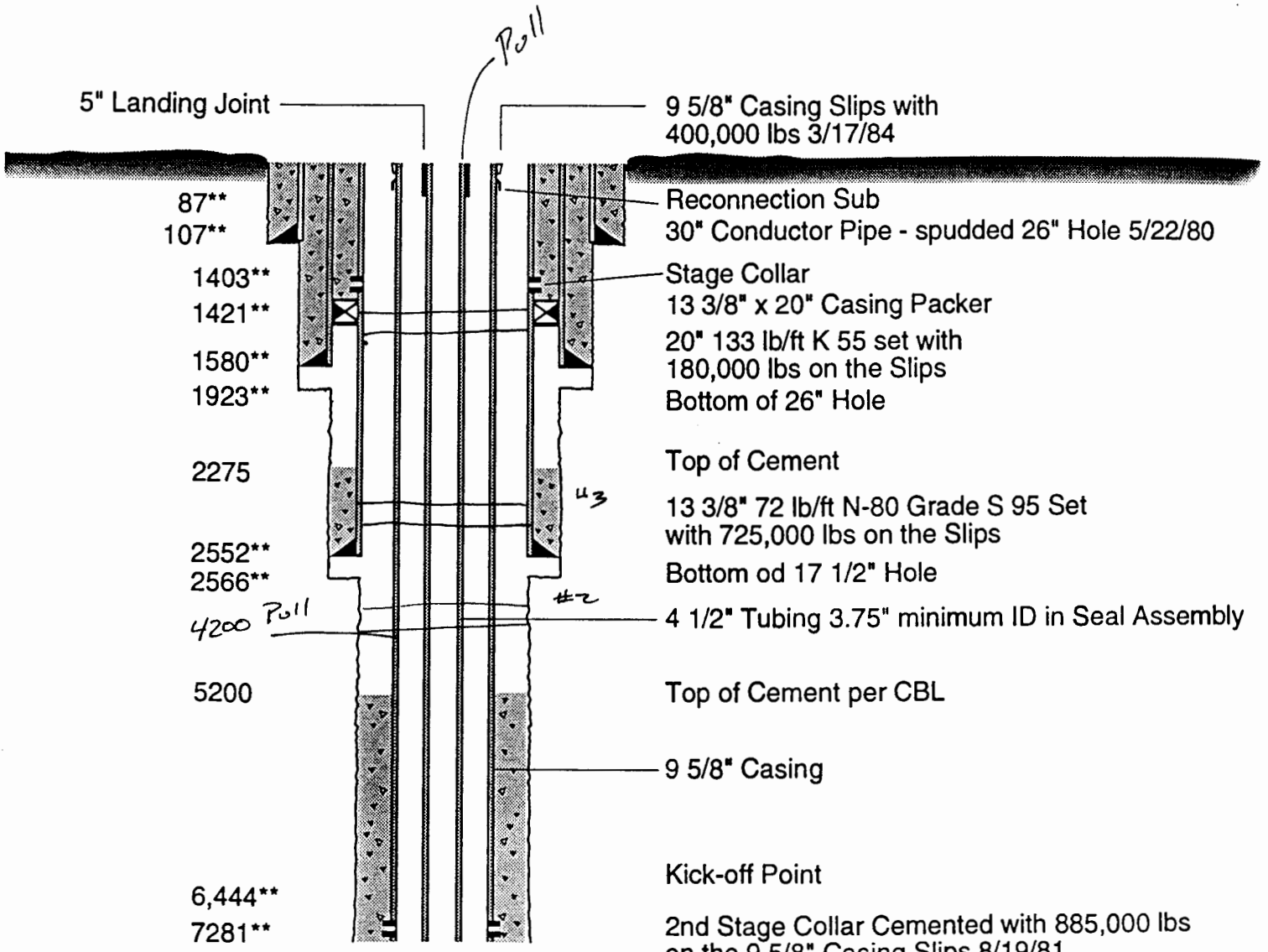
---

150 hours (6.25 days) Total Time on Location

OK

Present Configuration of EE 3-A

As Completed June 17, 1988
(Drawing revised 4 /15/91, all depths in ft)

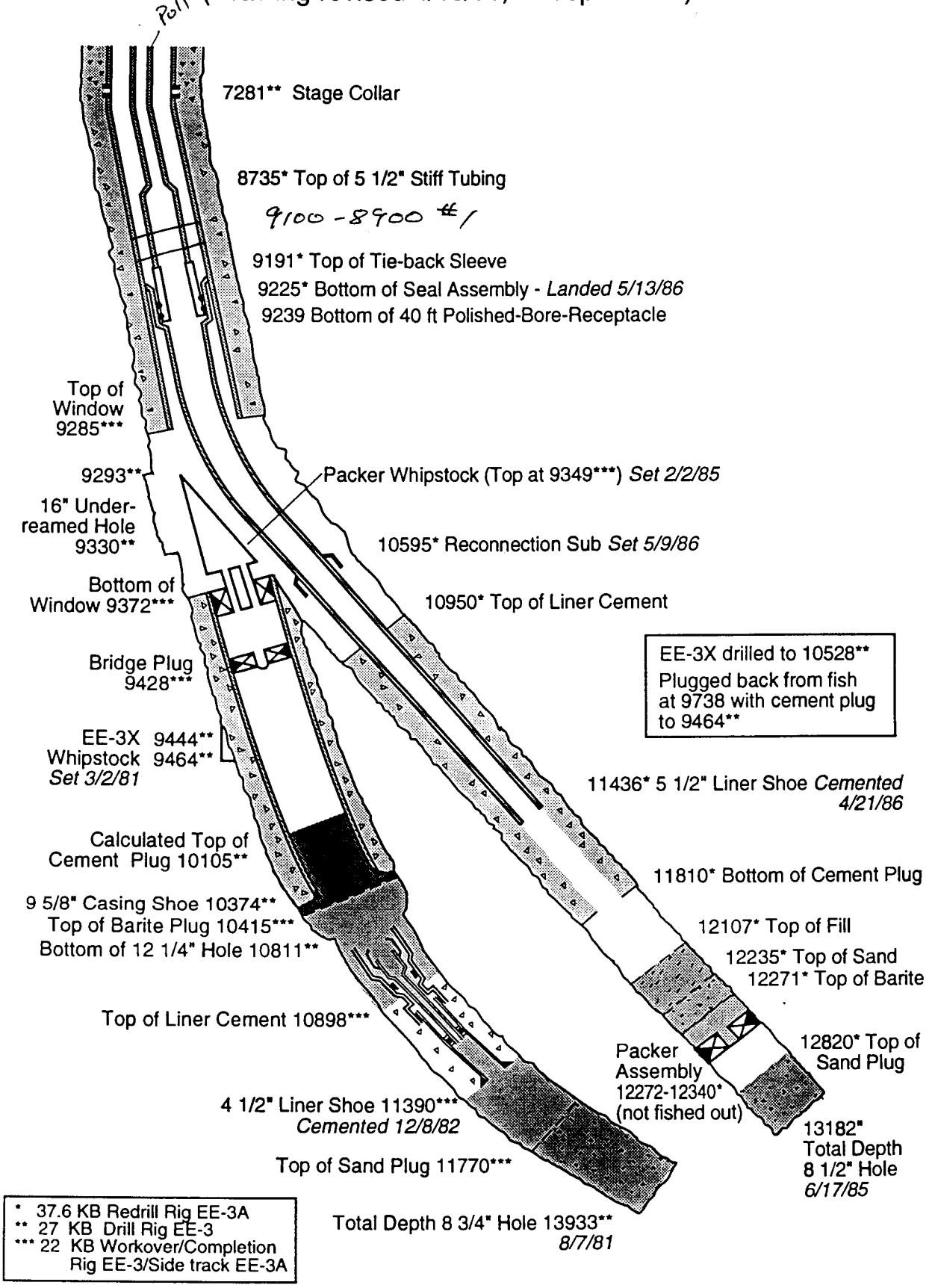


* 37.6 KB Plugback EE-3A
** 27 KB Drill Rig EE-3
*** 22 KB Workover/Completion Rig EE3-Side track EE-3A

Attachment 2.C. (cont'd)

Present Configuration of EE-3A. Completed by May 14, 1986

(Drawing revised 4/15/91, all depths in ft)



Canadian Pacific Hotels & Resorts

Jasper Park Lodge

ROY, HERE IS THE
(BETTER-LATE-THAN-NEVER)
WRITTEN NOTICE OF OUR
VERBAL NOTIFICATION TO
YOU RE THE 9S/D"
CSG LEAK IN EE 3A,
HOPE YOU HAVE (HAD)
A NICE THANKSGIVING.

TONY

Reservations: Canada and United States 1-800-441-1414

Event Report
Casing Leak -- Well EE3-A

Los Alamos National Laboratory
Fenton Hill Hot Dry Rock Geothermal Site
Sandoval County, New Mexico

8/24/95

Mr. Roy Johnson
Senior Petroleum Geologist
Supervisor District IV
State of New Mexico
Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

Dear Roy,

The following report memorializes our conversation of 8/16/95.

At approximately 4:00PM 7/20/95 pressure break through was noted between the 9-5/8" and 13-3/8" casing strings in injection well EE 3-A. While injecting 150 gpm at 3550 psi surface pressure the 9-5/8" X 13-3/8" annulus pressure rose from 50 to 170 psig at 4:00PM. Suspended injection at 4:30 PM and opened the annulus to the sump. The annular flow stabilized at approximately 29 gpm prior to shut-in. Subsequent tracer and temperature surveys indicated that the leak between the 4-1/2" X 9-5/8" annulus and the 9-5/8" X 13-3/8" annulus is located 4150' below the wellhead flange. The well will remain shut-in pending repair or abandonment. LANL will submit detailed repair or abandonment procedures to the US Forest service and the NMOCD prior to commencement of operations.

Sincerely,

Thomas A. Turner
Consultant at Los Alamos National Laboratory

LOS ALAMOS NATIONAL LABORATORY
ENERGY, ENVIRONMENT, AND TECHNOLOGY
MAIL STOP D443

FACSIMILE COVER SHEET

DATE: 6/28/93

TO: OCD
ATTN: Roy Johnson

FROM: Jim Thomson

REPLY REQUESTED YES ✓ NO ____
NUMBER OF PAGES 4
(INCLUDING COVER SHEET)
LOS ALAMO NATIONAL LABORATORY
PHONE: (505) 667-7900
FAX: (505) 667-3377
(CALL AHEAD)

MESSAGE: _____

Los Alamos National Laboratory
Group EES-4 - Geoengineering
Fenton Hill HDR Project
Phone: (505) 667-7900
FAX: (505) 667-3377 (phone ahead)

N.M. Energy, Minerals, and Natural Resources Department
Oil Conservation Division
Attn: Mr.Roy Johnson

6/28/93

Dear Roy,

On June 22 we performed a "dry run" of the 9-5/8" casing integrity test of injection well EE-3A. The test indicates that the casing is intact. Please find attached two graphs of the data obtained during the test. Figure 1 has a time span of 3 hours from 08:25 to 11:25 on 6/22/93 and shows the injection into the annulus and the early backside shut-in. Figure 2 includes the Fig. 1 time span and shows the overnight shut-in of both annuli. A chronological summary follows. As before, the 9-5/8" x 13-3/8" annulus is called the "annulus" and the 4-1/2" x 9-5/8" annulus is the "backside".

6/21/93
Vented gas pressure (67 psi) from annulus and shut in.

6/22/93
07:00 - Vented gas pressure (0.5 psi) from annulus.
08:47 - Began injecting water into the annulus at 114 gpm using two 3" x 2" centrifugal pumps. Backside pressure began dropping due to cooling as seen during the previous test in 12/91.
09:20 - Annular pressure began to rise - shut off one pump and continued injecting at 20-30 gpm. Annular pressure rose to 176 psig (max. output of pump).
09:40 - Injection rate dropped sharply - shut off pump and shut in annulus. Cumulative injection was 4037 gallons. Annular pressure fell off to vacuum in 1 hour and 45 minutes.
10:40 - Shut in backside - pressure (P-9B) rose to 342 psig overnight. No pumping was necessary. Annular pressure (P-9A) stayed on vacuum.

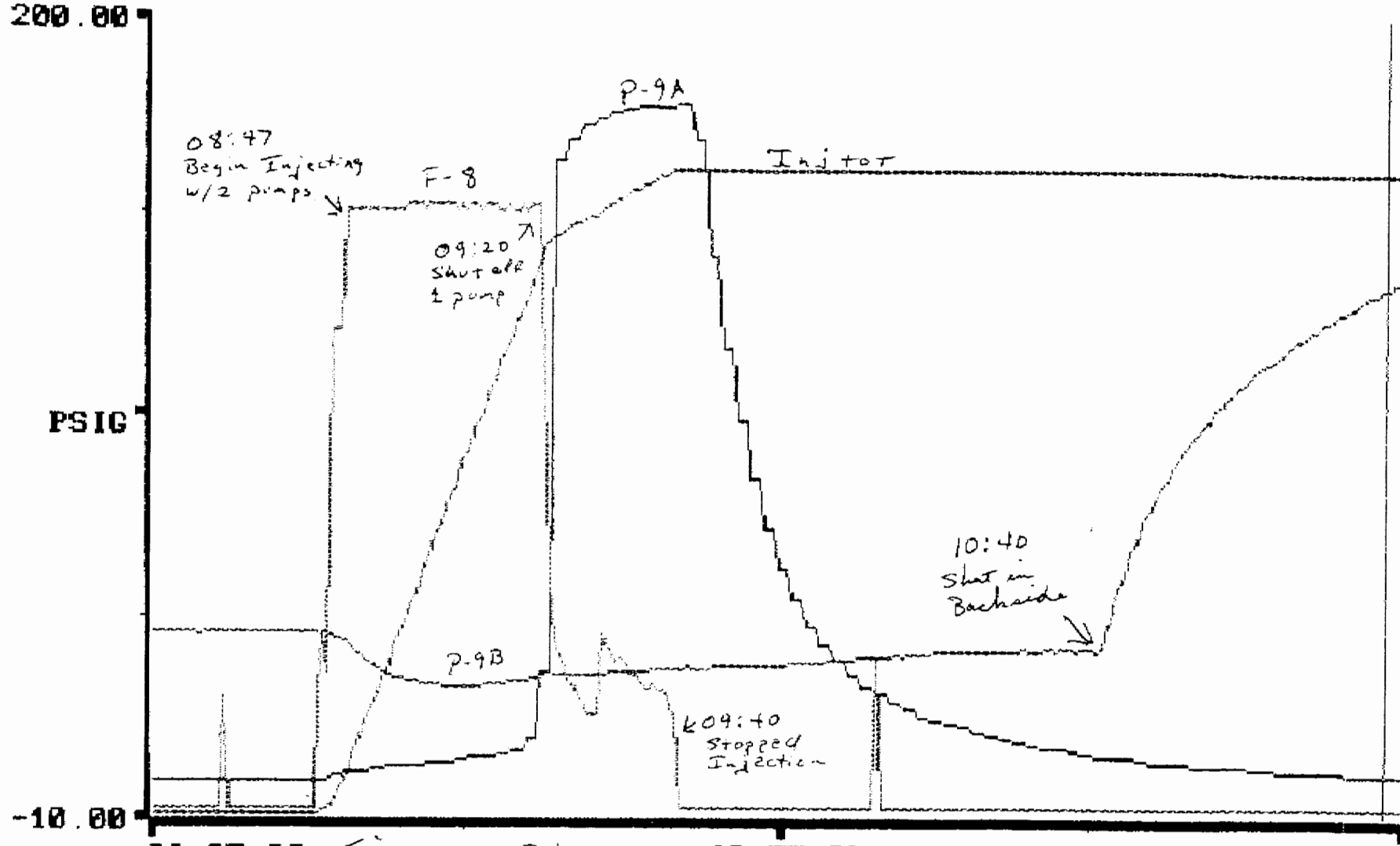
6/23/93
10:40 - Put backside on vent.

Roy, we can schedule a witnessed rerun of the test any time it's convenient for you. Monday through Thursday sometime in July or August would be preferred. Let me know.

Sincerely,

Jim Thomson

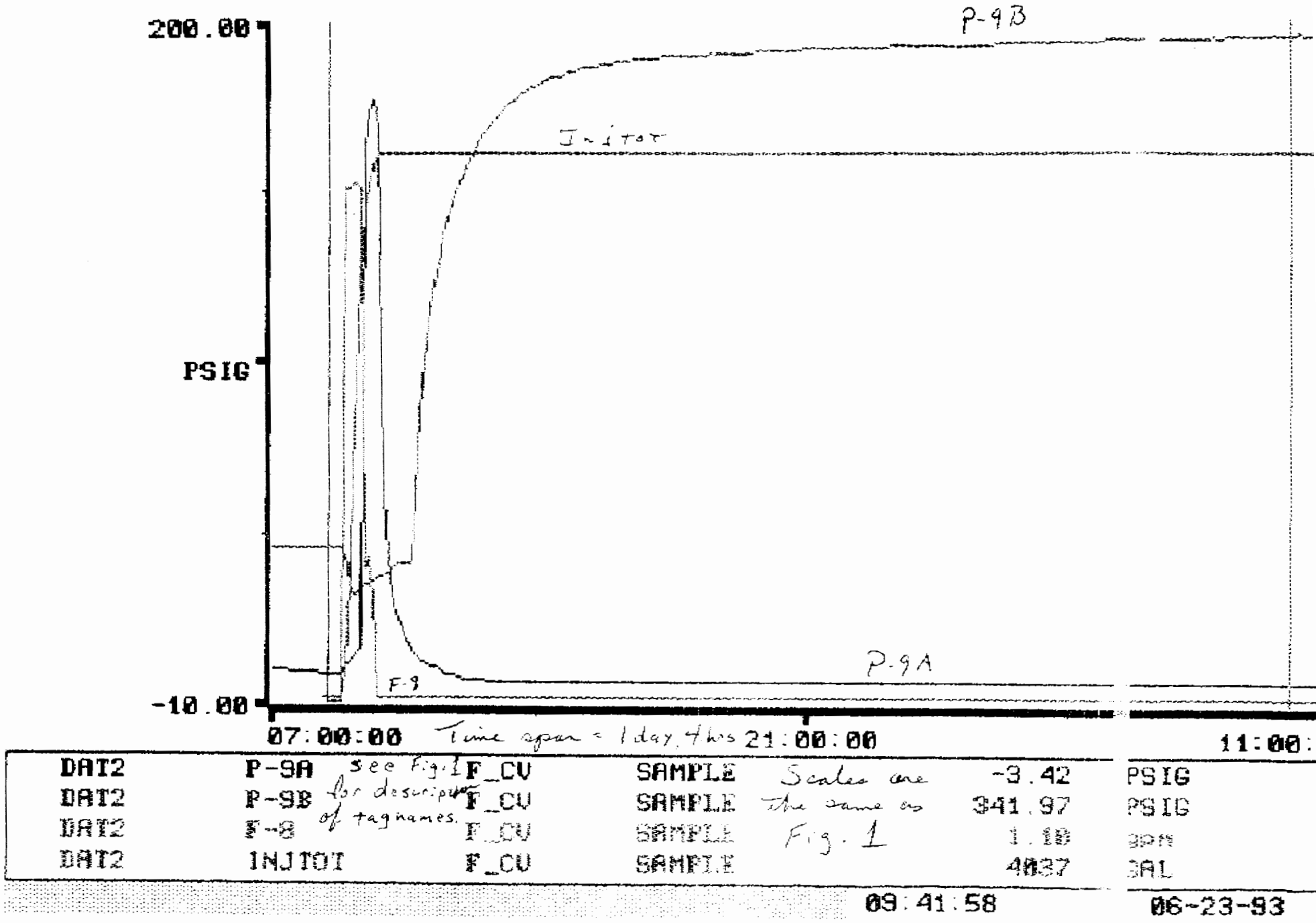
cc: Distribution



DAT2	P-9A (annulus)	F_CV	SAMPLE (-10 - 200 psig)	0.49	PSIG
DAT2	P-9B (Backside)	F_CV	SAMPLE (-10 - 350 psig)	227.06	PSIG
DAT2	F-8 (Injection Rate)	F_CV	SAMPLE (0 - 150 spm)	1.10	SPM
DAT2	INJTOT (Cumulative Injection)	F_CV	SAMPLE (0 - 5000 gal (Scale))	4037	GAL

11:21:40 06-22-93

Fig. 1



see Fig. 1 for description of tagnames.

Scales are the same as Fig. 1

Fig. 2

LOS ALAMOS NATIONAL LABORATORY
ENERGY, ENVIRONMENT, AND TECHNOLOGY
MAIL STOP D443

FACSIMILE COVER SHEET

DATE: 6/16/93

TO: O.C.D.
ATTN: Ray Johnson

FROM: Jim Thomson

REPLY REQUESTED YES ✓ NO
NUMBER OF PAGES 3
(INCLUDING COVER SHEET)
LOS ALAMO NATIONAL LABORATORY
PHONE: (505) 667-7900
FAX: (505) 667-3377
(CALL AHEAD)

MESSAGE:

Los Alamos National Laboratory
Group EES-4 - Geoengineering
Fenton Hill HDR Project

N.M. Energy, Minerals, and Natural Resources Department
Oil Conservation Division
Attn: Mr.Roy Johnson

6/14/93

Dear Roy,

It is our understanding that in order to remain in compliance with RULE G-505 - SURVEILLANCE, a positive test of the 9-5/8" casing in our injection well, Well# EE-3A, is required by 12/19/93. We would prefer to accomplish this task during late June or July of 1993 because a funding shortage is mandating a major reduction in personnel at the site and because this sort of testing is best done during warm weather to avoid the potential for freezing.

The procedure that we propose to use is identical to that used in December, 1991 and is detailed below. We would first pump into the 9-5/8" x 13-3/8" annulus (herein referred to as the annulus) to demonstrate communication with the sub-hydrostatic region at 1600-2300 ft. The 4-1/2" x 9-5/8" annulus (herein referred to as the "backside") will then be pressurized and the backside and annular pressures observed for evidence of leakage across the 9-5/8" casing. Pending your approval of this procedure, we plan to perform the test, forward the results to your office, and invite an OCD representative to w[illegible]s a repeat of the test.

Data collection during the test will be performed with a PC-based data acquisition system at 10 sec. collection intervals. Flow will be measured with a 2" turbine located in the injection line and totalized by the PC. Pressure transducers and gauges will be located on the backside and the annulus. Calibration of intruments will be verified prior to testing.

Procedure:

1. Vent gas pressure from the annulus through gauge vent port - remain upwind and carry hand held H2S monitor. Annular pressure is currently 60 psi.
2. Pump 5,000 gallons of water into annulus using 2 Myers 7" centrifugal pumps. (the annulus should go on vacuum).
3. Stop pumps and shut outer annulus valve.
4. Monitor shut-in pressure for one hour.
5. Shut in backside vent and allow pressure to increase for 15 minutes.

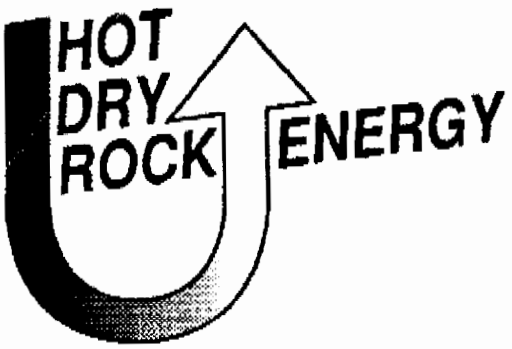
6. Pump with Roto-Jet (high pressure pump) until backside pressure reaches 250 psig.
7. Stop pump and shut in backside.
8. Maintain shut-in data collection for 24 hours.
9. Blow down annulus if there is pressure and record any fluid flow observed.
10. Open backside to vent system.

Please feel free to contact me at 667-7900. Our FAX number is 667-3377 (not a dedicated line - call first and have someone turn the FAX machine on).

Sincerely,

Jim Thomson

cc: EES-4 Group file



Los Alamos National Laboratory
Hot Dry Rock Program
MS D-443
Los Alamos, NM 87545
USA

Telephone (505) 667-4318
FAX (505) 667-8487

FAX Transmission

From: Don Dreesen

To: Roy Johnson
OCD of NM Energy & Minerals Dept

FAX No: 505 827 5741 **Confirmation No:** 827-5800
5741

Message: Roy

These are the results of the test on the 9 5/8" casing in EE-3A. I will be in the office Monday, January 6.

Number of Pages, including cover sheet: 7

Date: Jan 2, 1991

Dresson
Don: 667-1913

G-110

TEST RESULTS - EE-3A 9-5/8" INTEGRITY TEST (2nd and 3rd TEST)

As proposed in Memorandum EES-4-91-254, Nov. 29 1991 a 2nd test procedure was developed and informally proposed by Thomas Turner, a Hot Dry Rock Project consultant, to Roy Johnson of the Oil Conservation Division of the NM Energy, Minerals and Natural Resources Department. A tentative approval of the following procedure was given:

1. Pump into the 9-5/8" x 13-3/8" ANNULUS and demonstrate that the ANNULUS is well connected to the sub-hydrostatic region extending from 1600 ft to 2300 ft depth. The injection pressure should be go on a vacuum. 2nd TEST

2. Shut-in and if necessary pump into the 4-1/2" x 9-5/8" BACKSIDE annulus and demonstrate that the BACKSIDE will pressure up to approximately 250 psig and, therefore, cannot be in communication with the ANNULUS. 3rd TEST

TEST RESULTS - 2nd 9-5/8" Casing Integrity Test

On Tuesday, December 17, the ANNULUS was found shut-in with less than 1 psig gas pressure on it. The ANNULUS was quickly blown down through a needle valve. The BACKSIDE was producing about 2 GPM with a producing back-pressure of 12 psig. The BACKSIDE flow is produced against a partially closed valve and typically produces enough CO_2 vapor to surge with the daily back- pressure fluctuating between 10 and 20 psig.

The temporary injection line was installed on the weld-o-let on the injection line near V46. The line was first connected to the ANNULUS outlet valve V147. The valve-removal plug on the opposite outlet was removed and a pressure gage (0-200 psig) was installed. The injection line filled with 700 gallons with gravity drive from the storage tanks. The annulus was opened to the injection line and the pressure was 0 psig. One and then two feed pumps were used to pump into the annulus at rates up to 250 gpm. A total of 2359 gallons was injected and the pressure was less than 0 psig at the end of each (two) pumping intervals.

The producing BACKSIDE pressure dropped from 12 psig to 3 psig during the injection into the ANNULUS. This is believed to be the result of the cooling of the BACKSIDE fluid which increases the head on the producing formation below 9285 ft and contraction of the fluid in the BACKSIDE. The BACKSIDE pressure increased to 8 psig in 10 minutes after the ANNULUS pumping was secured.

TEST RESULTS - 3rd 9-5/8" Casing Integrity Test

On Tuesday, December 17, the BACKSIDE production was shut-in and the BACKSIDE pressure increased from 8 psig to 116 psig in 11 minutes. The feed pumps were started up and instantly increased the BACKSIDE pressure to 174 psig. The feed pumps were shut in after one minute. The shut-in BACKSIDE pressure continued to increase from 174 psig to 185 psig in 46 minutes. The high pressure make-up pumps were used to inject into the BACKSIDE for 1 minute. The BACKSIDE pressure increased from 185 psig to 260 psig. After the make-up pumps were secured the shut-in BACKSIDE pressure decreased from 260 psig to 215 psig in 9 minutes. The shut-in ANNULUS pressure remained at 0 psig during the entire BACKSIDE shut-in and injection sequence.

A summary of the 2nd and 3rd test data is shown on Table 1.

TEST RESULTS - 4th 9-5/8" Casing Integrity Test

On Thursday, December 19, the BACKSIDE production was shut-in and the BACKSIDE pressure increased from approximately 1 psig to 192 psig in 77 minutes. After 167 minutes the BACKSIDE pressure had increased to to 225 psig. The shut-in BACKSIDE pressure continued to increase from 192 psig to 225 psig in 90 minutes. The BACKSIDE was then put back on production. (See attached plot.)

RECOMMENDATION

A summary of the test results for the 2nd, 3rd and 4th test will be furnished to the OCD of the NMEM&NRD. If these result are found to be sufficient to serve as an positive casing integrity test of the 9-5/8" casing as required by RULE G-505. SURVEILLANCE, a re-test should be scheduled with a representative of the OCD present. These two tests would then be performed at least every two years to check the integrity of the 9-5/8" casing and the results furnished to or witnessed by the OCD.

TABLE 1
9-5/8" CASING INTEGRITY TESTS - 2ND AND 3RD TEST RESULTS

2ND TEST - INJECTION INTO 9-5/8" X 13-3/8" ANNULUS

	PRESSURE DATA		INJECTION DATA		
TIME	BACKSIDE	ANNULUS	RATE	TOTAL	COMMENTS
12/17/91	(psig)	(psig)	(gpm)	(gal)	
	*				BACKSIDE producing.
14:33	11.7	0.0	0.0	0	Open BACKSIDE to pressure transducer.
14:45	9.6	0.0	0.0	0	Open ANNULUS to injection line.
14:45	9.6				Start 1st feed pump.
14:50	4.1	<0.0	133.7	689	Start 2nd feed pump.
14:51	4.1	<0.0	249.1	1000	
14:53	3.4	<0.0	0.0	1360	Feed pumps secured.
14:55	3.4	0.0	135.7	1360	Start 1st feed pump.
14:57	3.4	<0.0	247.0	1637	Start 2nd feed pump.
15:00	3.4	<0.0	0.0	2359	Feed pumps secured.

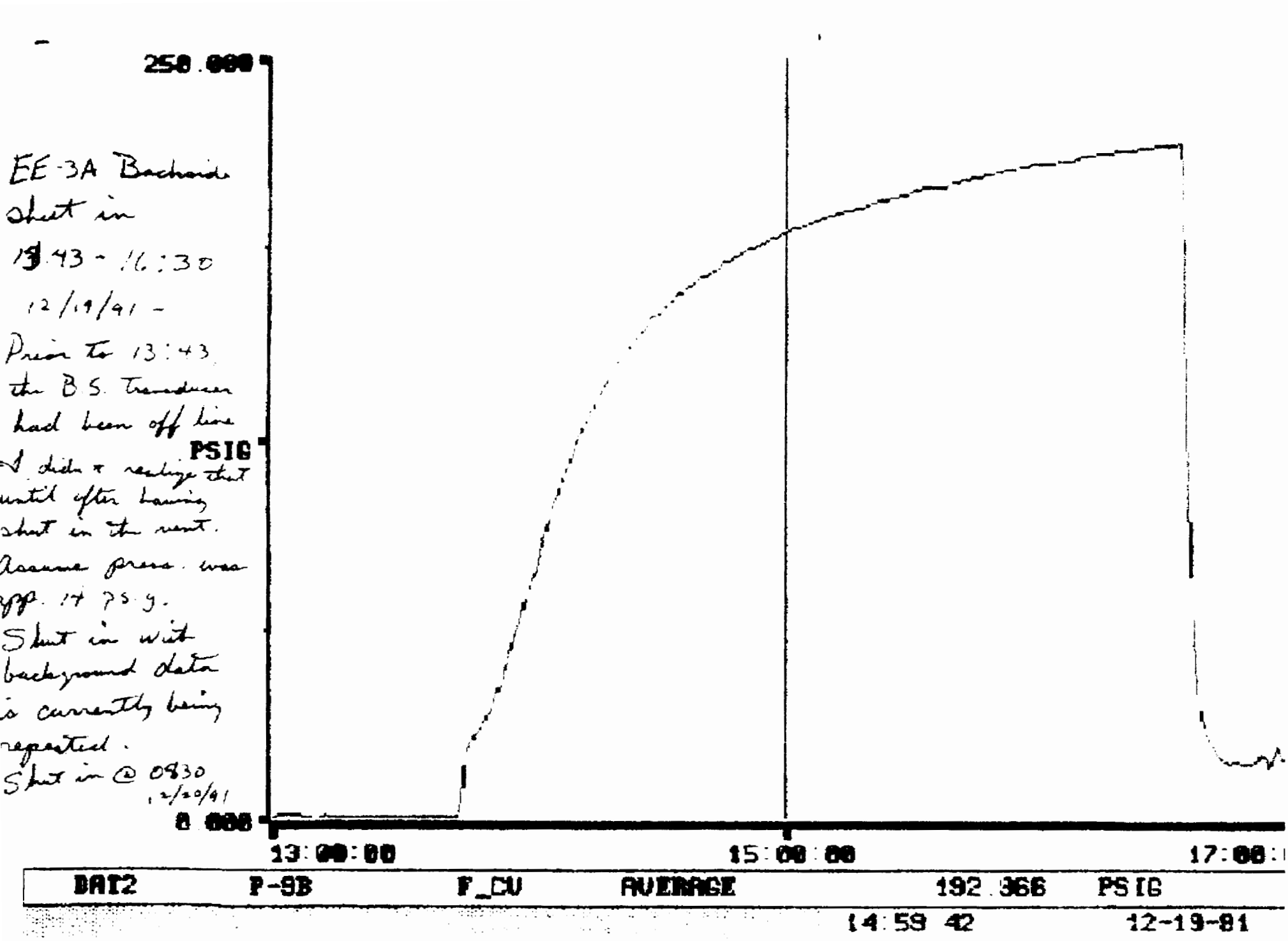
3RD TEST - SHUT-IN AND INJECTION INTO 4-1/2" X 9-5/8" BACKSIDE

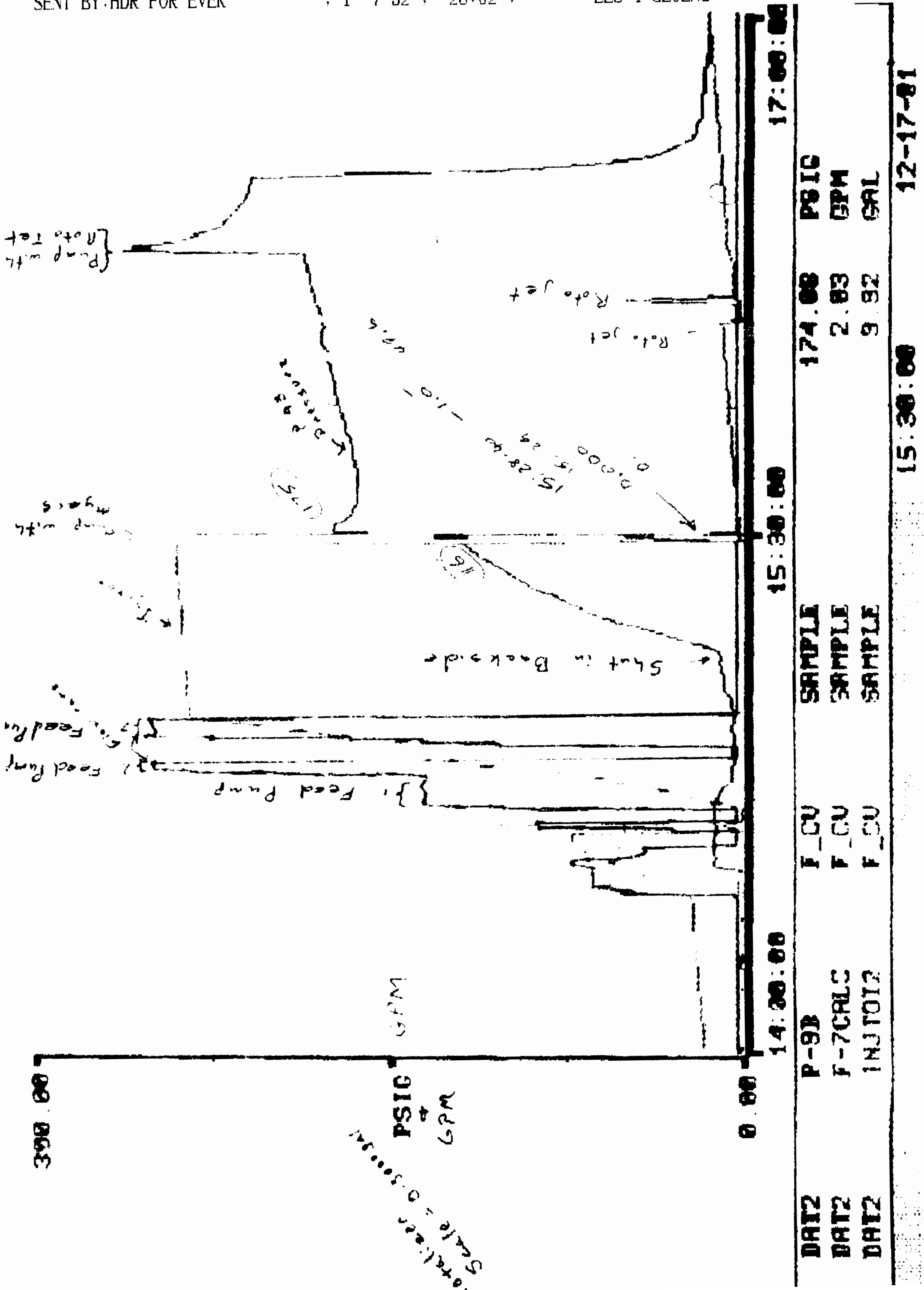
	PRESSURE DATA		INJECTION DATA		
TIME	BACKSIDE	ANNULUS	RATE	TOTAL	COMMENTS
12/17/91	(psig)	(psig)	(gpm)	(gal)	
					ANNULUS shut-in.
15:10	8	--	0.0	0	Shut-in BACKSIDE production.
15:21	79	0.0	0.0	0	BACKSIDE build-up.
15:26	104	0.0	0.0	0	BACKSIDE build-up.
15:30	116	0.0	47.0	0	Start 1st feed pump.
15:31	175	0.0	0.0	TSTM	Start 2nd feed pump.
15:32	175	0.0	0.0	TSTM	Maximum feed pump pressure output & feed pumps secured.
15:40	165	0.0	0.0	TSTM	BACKSIDE shut-in pressure.
15:53	173	0.0	0.0	TSTM	BACKSIDE shut-in pressure.
16:06	180	0.0	0.0	TSTM	Open BACKSIDE to injection line.
16:18	188	0.0	55.0	TSTM	Start make-up pump.
16:19	260	0.0	0.0	TSTM	Make-up pump secured.
16.22	239	0.0	0.0	TSTM	BACKSIDE shut-in.*
16:28	215	0.0	0.0	TSTM	BACKSIDE shut-in.
16:33	212	0.0	0.0	TSTM	BACKSIDE on production.
17:00	8	0.0	0.0	--	BACKSIDE producing.

TSTM = to small to measure, < than 10 gallons.
* See attached plot.

4TH TEST - SHUT-IN OF 4-1/2" X 9-5/8" BACKSIDE

	PRESSURE DATA		INJECTION DATA		
TIME	BACKSIDE	ANNULUS	RATE	TOTAL	COMMENTS
12/17/91	(psig)	(psig)	(gpm)	(gal)	
					ANNULUS shut-in.
13:43	1	--	0.0	0	Shut-in BACKSIDE production.
15:00	192	--	0.0	0	BACKSIDE build-up.
16:30	225	--	0.0	0	BACKSIDE build-up.
16:30	225	--	0.0	0	BACKSIDE ON PRODUCTION




300.00
PSIG + GPM
0.00
GPM
14:30:00
15:30:00
17:00:00
P-9B
F-7CALC
INJTOT2
F_CU
F_CU
F_CU
SAMPLE
SAMPLE
SAMPLE
174.00
2.83
9.92
PSIG
GPM
GAL
DAT2
DAT2
DAT2
15:30:00
12-17-91
Roto Jet
Roto Jet
Shut in Backside
Feed Pump
Pump with Roto Jet

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

OIL CONSERVATION DIVISION
RECEIVED
'91 JUL 8 AM 9 41

DATE: June 25, 1991
IN REPLY REFER TO: EES-4-91-100
MAIL STOP: D443
TELEPHONE: (505)667-4318

Mr. William J. Lemay, Director
Oil Conservation Division
NM Energy, Minerals and
Natural Resources Department
P.O. Box 2088
Santa Fe, NM 87504-2088
Attn.: Roy Johnson

Thru: Allen J. Tiedman
Associate Director for Operations
Los Alamos National Laboratory

Dear Sir:

Subject: INJECTION OPERATIONS IN WELL EE-3A, FENTON HILL, NM

Pursuant to the "State of New Mexico Energy and Minerals Department, Oil Conservation Division - Geothermal Rules and Regulations" dated 11/15/83, Rule G-503, the Department of Energy, Los Alamos National Laboratory requests your approval to commence injection operations in well EE-3A at the Fenton Hill Hot Dry Rock Geothermal Energy test site located in Sandoval County, New Mexico. This well is on U.S. Forest Service land that has been reserved for the purpose of conducting hot dry rock reservoir system experiments by way of a special agreement between the U.S. Department of the Interior (Forest Service) and the Department of Energy. The injection operations and all other associated activities are described in Ground Water Discharge Plan (GW-31) which was approved on June 5, 1985 and renewed by your Department on May 17, 1990.

Testing of the artificial hot dry rock reservoir is scheduled for the latter part of this year. The reservoir was created by connecting two wells (an injection well and a production well) with a hydraulically induced artificial fracture system. The reservoir test will involve the long term injection of water (produced on site) into well EE-3A in the interval 11,436 ft (3487 m) to 12,107 ft (3691 m), its subsequent production from well EE-2A and circulation through surface heat exchange equipment prior to "closed loop" reinjection back into well EE-3A. Flow rates as high as 11,520 barrels per day are planned at pressures as high as 4500 psig to be injected into the openhole zone between the bottom of the 5½" liner and the PBTD at 12,107 ft (3691 m). Figure I in the attached "History of Drilling and Reworking Hot Dry Rock Geothermal Injection Well EE-3A in Sandoval County, NM." is a schematic of the injection well. The attached report, "ICFT: An Initial Closed-Loop Flow Test of the Fenton Hill Phase II HDR Reservoir," (ICFT Report) describes, in detail, the results of a test injection into EE-3A with EE-2 on production.

EE-3A was completed with an openhole injection interval below the 5½" OD liner and an openhole production interval above the liner and connected to the tubing casing annulus. The upper interval includes two low pressure zones at 9298 ft-9446 ft (2835 m -2880 m) and 10135 ft-10250 ft (3090 m-3124 m) which accept water at 6.5 bbl/min at pressures less than 2000 psi. See Figure III-30, III-10, and Figure IV-10 in the attached ICFT report.

Low pressure injection zones have been penetrated by each of the four wellbores that penetrated the 9900 ft-10500 ft (3020 m-3200 m)region at Fenton Hill, EE-2, EE-3, EE-2A, and EE-3A. These zones will provide a barrier to upward migration of injection water from the deeper Phase II reservoir and will be monitored continuously to insure that no fracture propagation or fluid migration occurs above the upper artificial reservoir. How

As reported on page 27 in the ICFT report, there was flow from the 4½"/5½" tubing by 9-5/8" casing annulus (backside) at rates between 2 and 6 gpm during high pressure injection. The backside flow response (to an injection pressure increase) lags by approximately two days. Communication between the injection interval and the openhole interval 9285 ft-10,950 ft (2831 m-3338 m) has developed in a tortuous reservoir path. The shut-in temperature log of 6/23/86, Figure III-2 on page 33 of the ICFT report, supports this, as it shows considerable fluid storage between 10,950 ft and 11,436 ft (3338 m and 3487 m) and production between 10,855 ft and 10,950 ft (3309 m and 3338 m).

MAX 206 BWPD

Fracture initiation and propagation gradients and measured rock strength values are discussed in detail in the ICFT report Table I-I on page 11. Pages 54, 55, and 56 discuss host fracture initiation and propagation values which are depicted on Figure IV-10, "Fracture closure pressure comparison with 1985 drilling campaign". Drilling rig log book data are shown in Table 1, a summary of the well history. During the planned injection tests, changes in reservoir volume and fracture propagation will be monitored in three dimensions with transducers that are located in a multiple-well downhole seismic array surrounding the site. The downhole seismic array wells are PC-1, PC-2, GT-1, and EE-1 depicted in Figure VI-1 on page 80 of the ICFT report.

Questionable on vert. migration — Horizontal migration ???

We propose to operate the injection well with the backside open and flowing into an open tank. This will assure: (1) fracture propagation and fluid migration into the surrounding rock above the low pressure injection zones and the bottom of the 9-5/8" casing at 9285 ft (2830 m) (9127 ft (2782 m) TVD) will not occur, and (2) injection operations will meet the requirements of the New Mexico State Oil Conservation Division injection practices guidelines that limit surface injection pressure to 0.2 psi/ft of depth to the highest perforation. Should it be necessary to shut in the tubing casing annulus, it is proposed that injection in the interval below the 5½" liner continues as long as the annulus pressure does not exceed 1825 psi (0.2 ft x 9127 ft (2782 m)) or until microseismic earthquake locations indicate fracture growth at a point above a depth of 10,000 ft (3050 m).

It is hereby requested that approval be granted to inject fluids at pressures of up to 4500 psig in order to maintain fracture dilation and adequate circulation within the artificial reservoir system. The artificial reservoir created around EE-3A and EE-2A has been extensively analyzed and monitored in regard to the control of fracture propagation behavior. Fluid containment, fluid chemistry and all parameters necessary to fully understand and characterize its behavior are routinely monitored. During evaluation of the reservoir, production, injection and reservoir monitoring wells will be instrumented. Pressure behavior and traverse logs will be run to assess reservoir performance and fluid containment.

The closest fresh water aquifer to the artificially induced hot dry rock reservoir system is a perched aquifer of limited extent, located 9500 ft (2896 m) above the intended zone of injection. At no time will geothermal fluids from the hot dry rock reservoir be allowed to invade this aquifer which will be continuously monitored by the analysis of fluids withdrawn for system make up water.

> Need statement on local structure !

Additional documents required by Rule G-503 for approval of injection are enclosed as follows: History of Drilling and Repair - Well EE-3A; Completion schematic of well EE-3A; Plat of existing wells and geothermal leases within one mile radius of proposed injector; and Generalized geologic section and static conductive temperature profile at Fenton Hill; two copies of New Mexico Oil Conservation Division Form G-112.

There are no active geothermal leases and no other geothermal operators working within a ½ mile radius.

Your consideration of this request for approval and variance to the 0.2 psi/ft guideline is greatly appreciated and should you have any questions or need of additional information, please don't hesitate to contact me at 505-667-4318 for clarification.

Sincerely,

James N. Albright
GeoEngineering Group Leader
Earth and Environmental Sciences Division

JNA:esm

Cy: Jerry Bellows, DOE, MS A316
Juan Griego, DOE FP, MS A316
John Puckett, HSE-DO, MS K491
Kenneth Hargis. HSE-8, MS K490
Steve Rae, HSE-8, MS K490
Neil William, HSE, MS K490
Dave Duchane, MS D443
Don Dreesen, MS D443
Ray Ponden, MS D443
CRM-4, MS A150
EES-4 file

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

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

APPLICATION TO PLACE WELL ON INJECTION-GEOTHERMAL RESOURCES AREA

Operator: Los Alamos National Laboratory/University of California under contract for DOE		Address: P.O. Box 1663, MS D443 Los Alamos, N.M. 87545	
Lease Name: Dept of Agriculture/US Forest Service-SPecial Use Permit	Well No.: EE-3A	Field: Phase II Reservoir Hot Dry Rock Test Facility	County: Sandoval

Location
Unit Letter G ; Well is Located 1755 Feet From The E Line And 1417 Feet From The N
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	30"	107 ft	concrete	surface	fill to surface
Surface Casing	20"	1580 ft	3050 SX 1:1 POZ	surface	Tag TOC w/45'1" of
Intermediate casing	13-3/8	2552 ft	1000 SX + 80% SF	surface	cement to surface
Long String	9-5/8"	9285 ft	2150 SX + 80% SF	2nd Stage 5200ft	cement bond log
	51/2"	9191-11436 ft	276SX 50% SF	10950 ft	cement bond log
Tubing	4 1/2"x 5 1/2"	9225 ft	Name, Model and Depth of Tubing Packer: Brown Oil Tool 6 1/4 OD x 5" ID x 40 ft PBR with 5" seals on a 4-3/4" OD x 3-3/4 ID x 47 ft seal assembl		

Name of Proposed Injection Formation: Phase II Reservoir	Top of Formation: 10,000 ft	Bottom of Formation: 12,750 ft

Is Injection Through Tubing, Casing, or Annulus? Tubing	Perforations or Open Hole? Open Hole	Proposed Interval(s) of Injection: 11436-12107 ft

Is This a New Well Drilled For Injection? No	If Answer is No, For What Purpose was Well Originally Drilled? Production-converted to injection with side track & redrill.	Has Well Ever Been Perforated in Any Zone Other Than the Proposed Injection Zone? Open hole observation zone on tubing/ casing annulus 9285-10950 ft.

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

Depth of Bottom of Deepest Fresh Water Zone in This Area: 450 ft.	Is This Injection for Purpose of Pressure Maintenance or Water Disposal? (See Rules 501 and 502): Pressure Maintenance

Anticipated Daily Injection Volume: 5760 bbl	Minimum: 0	Maximum: 11520 bbl	Open or Closed Type System: Closed	Is Injection to be by Gravity or Pressure? Pressure	Approx. Pressure (psi): 3500-4200

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: Yes	Natural Water in Injection Zone: None	Are Water Analyses Attached? Yes, Table V-I, ICFT Rpt)

Name and Address of Surface Owner (or Lessee, if State or Federal Land): Los Alamos National Laboratory/University of California under contract for DOE.

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: Yes ☒ No ☐	Electrical Log: Yes ☐ No ☒	Diagrammatic Sketch of Well: Yes ☒ No ☐

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

James M. Albright (Signature) — Geo Engineering Group Leader (Title) — 6/25/91 (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.

April 4, 1991

HISTORY OF DRILLING AND REWORKING HOT DRY ROCK GEOTHERMAL INJECTION WELL EE - 3A SANDOVAL COUNTY, NEW MEXICO

Well Location: 1755 ft W. and 1417 ft S. of the NE corner of Sec. 13, T19N, R2E NMPM

Elevation: G.L. = 8697 ft ASL

Total Depth: 13,933 ft

Redrilled Total Depth: 13,182 ft

Hot Dry Rock (HDR) Geothermal injection well EE-3 was spudded 5/22/80 and completed as a geothermal production well on 8/25/81. The well was converted to HDR fracturing service on 3/18/84.

In January 1985, the well was prepared for sidetracking and redrill to intercept a HDR reservoir created by massive hydraulic fracturing in well EE-2. Well EE-3 was plugged back with sand and barite plugs to 10,415 ft and with 130 cu. ft of Class H cement with 40% silica flour from 10,415 ft to 10,105 ft, 269 ft inside the 9-5/8" casing shoe. A cast iron bridge plug was set at 9428 ft and the milled section (9285 ft-9372 ft) was then cemented and drilled out and the well was side tracked off a two degree per one hundred foot whipstock set at 9373 ft on 2/2/85 and redrilled to a redrilled total depth of 13,182 ft.

Openhole packers were used to fracture the openhole region from 10,829 ft to 13,182 ft depth. The well was re-completed by running a 5-1/2" 20 lb/ft, C-90 Hydril Tac I and VAM and 23 lb/ft L-80 VAM liner from 11,436 ft to 9191 ft, cemented from 11,436 ft to 10,950 ft. The liner is equipped with a 40 ft 5" ID polished bore receptacle. The tubing string includes a 5" 20.8 lb/ft C-90 VAM hanger joint, 8665 ft of 4½" 15.1 lb/ft L-80 VAM tubing, and 442 ft of 5½" 20 lb/ft C-90 and 23 lb/ft L-80 lower section to reduce buckling on a seal assembly with 4 seals. The seals were located 14 ft above bottom of the receptacle and the rig was released 5/16/86. A short term test was conducted from 5/19 through 6/18/86 that resulted in the determination of the EE-3A wellbore fluid containment profile and an analysis of fluid movement, rock strengths, and fracture propagation behavior within the reservoir. A copy of the test results, "1CFT: An Initial Closed-Loop Flow Test of the Fenton Hill Phase II HDR Reservoir," is enclosed.

Present Condition of Well: (All depths from this point to the next datum reference refer to a RKB 27 ft above ground level.)

Conductor - 30" conductor set and cemented at 107 ft (80 ft G.L.).

Surface Casing - 20" 133 lb/ft K-55 casing cemented from the shoe at 1580 ft to the surface in 26" hole (drilled to 1923 ft) with 3050 sacks of Class H cement mixed 50/50 with pozzolan, 40% silica flour, 1/4 lb/sack Floseal and 2% gel. The casing was jacked and set with 180,000 lb tension.

Intermediate Casing - 13-3/8" 72 lb/ft N-80 (1027 ft) and S-95 (1525 ft) casing cemented to the surface with Class H cement mixed with 80% silica flour at 16.6 lb/gal. in two stages from the shoe at 2552 ft in 17-1/2" hole (drilled to 2566 ft)

(200 sacks) and inside the 20" casing through ports above a 13-3/8" X 20" casing packer at 1403 ft (800 sacks) with 1000 sacks of Class H cement and set with 725,000 lbs of tension.

Production Casing - 9-5/8" 53.3 lb/ft (2 joints) and 47 lb/ft P-110 VAM casing stage cemented in 12-1/4" hole (drilled to 10,528 ft) at 10,374 ft and 7,281 ft, with 2150 sacks of Class H cement and set with 885,000 lbs of tension. The first stage consisted of 950 sacks of Class H cement premixed with 40% silica flour, 40% silica sand, 2% bentonite, turbulance enhancers and retarders. Cement volume calculated to fill to stage collar plus 25% excess. The second stage consisted of 1200 sacks of Class H cement mixed with 1200 cu. ft of expanded perlite, 20% silica flour, 20% silica sand, 2% bentonite, retarder, turbulance enhancers and anti-foam agents.

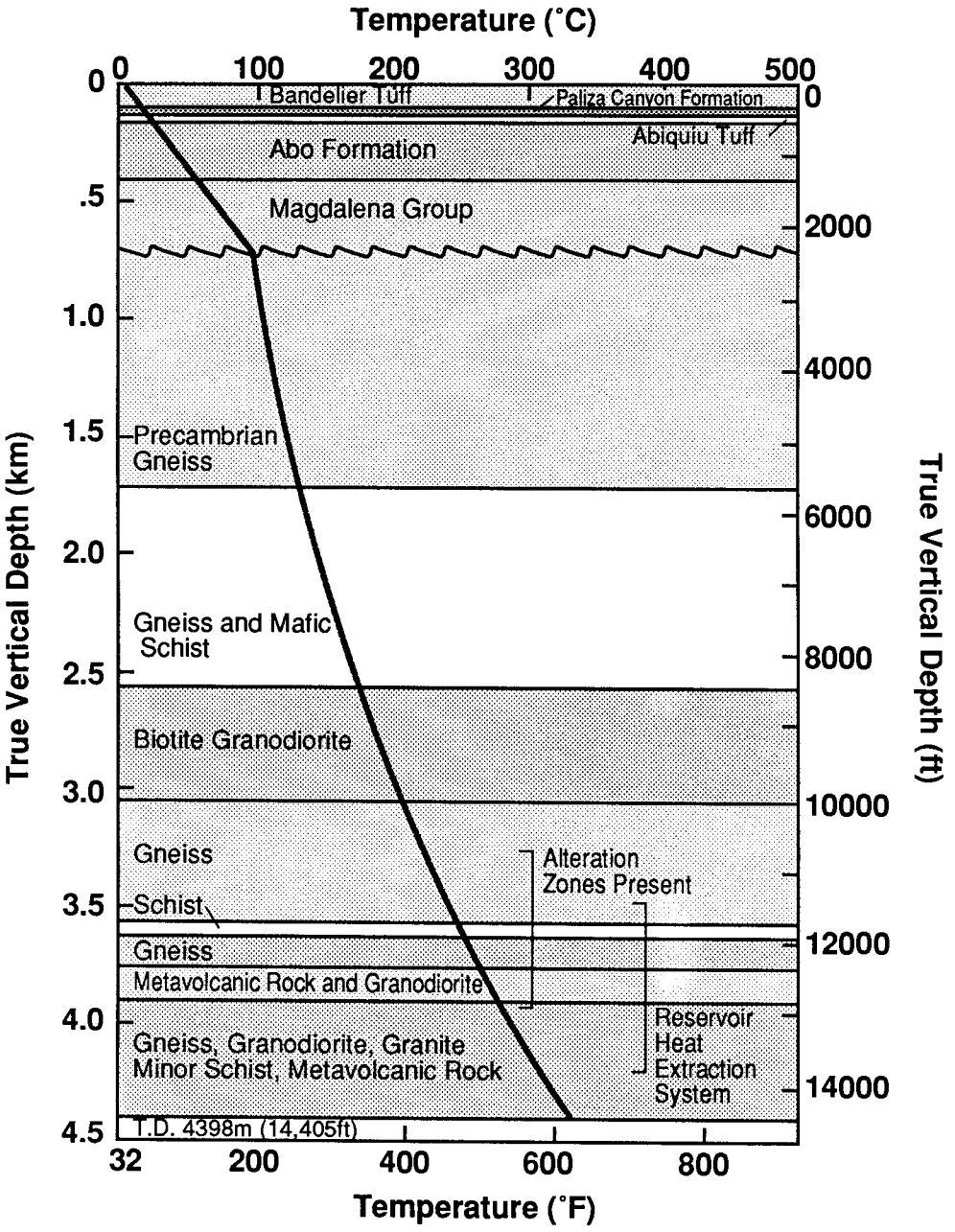
EE-3 Liner - A 4½" 11.6 lb/ft N-80 Buttress liner was hung in 9-5/8" casing at 10,105 ft after it was cemented in the openhole from 10,898 ft to 11,390 ft. Stimulation below the liner failed to establish production (a connection to the EE-2 reservoir).

Massive Hydraulic Fracturing (MHF) - The well was converted to a hydraulic fracturing (reservoir creation) service by removing the uncemented liner, installing a liner patch and by reducing the tension on the uncemented portion of the 9-5/8" casing to 400,000 lb. A 2,000,000 gallon hydraulic fracturing experiment was conducted with injection below the liner. Production was not established.

EE-3A Redrill - The well was prepared for redrilling and conversion to injection service as follows:
(1) The 9-5/8" casing, 12-1/4" and 8-3/4" (drilled to a TD of 13,933 ft) hole were plugged with sand, barite and cement from TD (all depths from this point to the next datum reference refer to a RKB 22 ft above ground level.) to 10,374 ft.
(2) A window was milled in the 9-5/8" casing from 9285 ft to to 9372 ft.
(3) A whipstock was set and the hole was sidetracked at 9285 ft (KOP) (all depths from this point to the end of this history refer to a RKB 37.6 ft above ground level).
(4) Wellbore EE-3A was then directionally drilled with 8-1/2" hole from 9285 ft, to the new RDTD at 13,182 ft intercepting the reservoir fracture system created by the hydraulic fracturing of EE-2 between 11,800 ft and 12,300 ft (based on micro-earthquake locations). Stimulation and massive hydraulic fracturing through openhole packers developed 2 large reservoirs, stimulated the intercepted reservoir fracture system and established the fracture gradient in the cemented region behind the liner. (See Table I) The last packer assembly was not retrieved from its location at 12,273 ft-12,340 ft depth. A 40 sack barite plug was spotted on the assembly and tagged at 12,271 ft. The top of fill is presently at 12,107 ft.

EE-3A Liner - A 5½" 20 lb/ft C-90 and 23 lb/ft L-80 liner was landed at 9191 ft with the shoe at 11,436 ft. The liner was cemented from a sand plug at 10,810 ft to 10,950 ft (CBL depth) with 220 sacks of 16.6 lb/gal Class H cement with 50% silica flour. The liner is equipped with a 6 ft long, 6.75" I.D. tie back sleeve, a 2 ft long J-sleeve, and a 40 ft 5.0" I.D. polished bore receptacle.

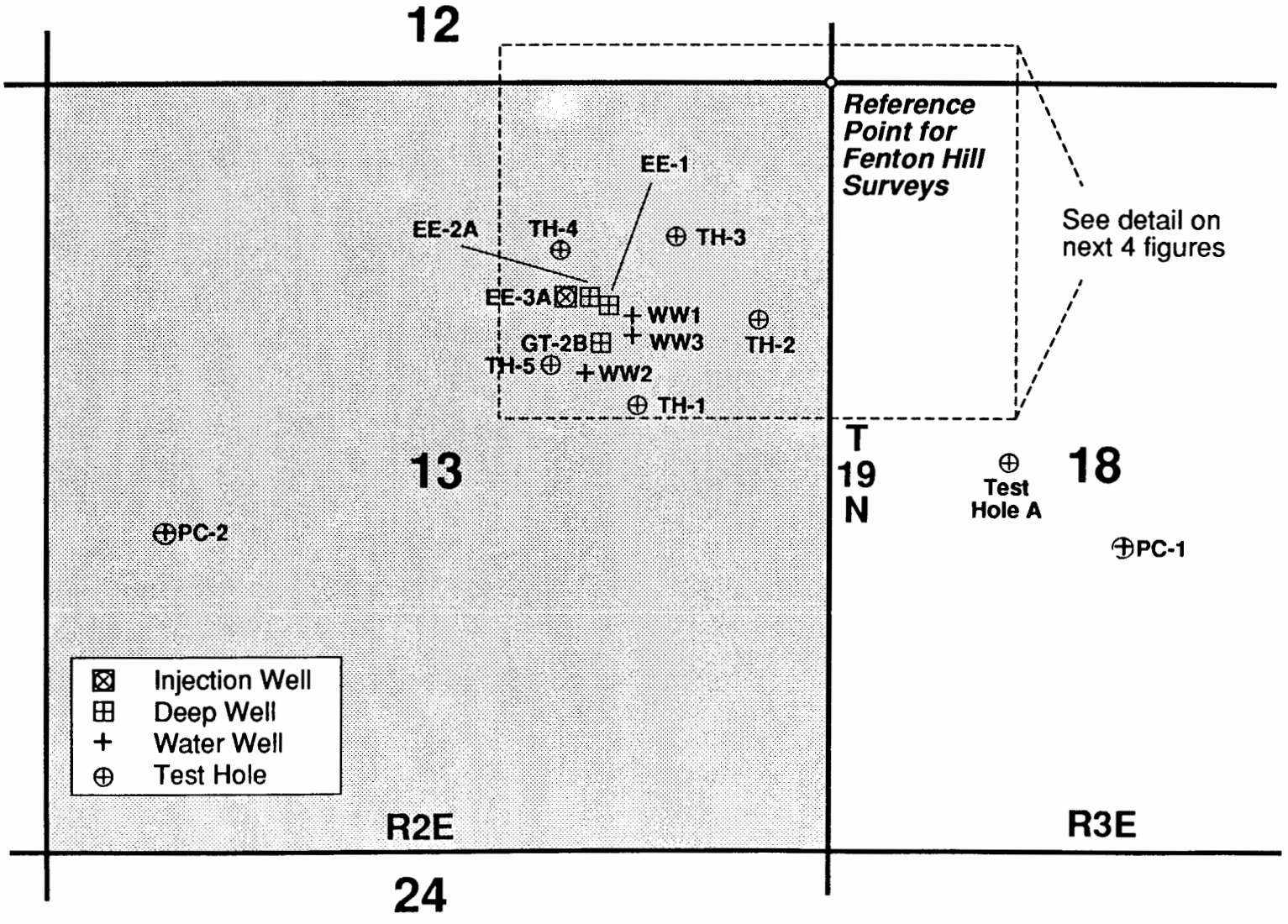
Tubing - 8665 ft of 4-1/2" 15.1 lb/ft L-80 VAM tubing with a 490 ft long 5-1/2" stiff, anti-buckeling stinger and seal assembly stabbed in PBR at 9191 ft. The stinger is made up of 263 ft of 23 lb/ft L-80 VAM on top and 180 ft of 20 lb/ft C-90 VAM tubing with 37 ft long, 4-3/4" O.D. X 3.750" seal bore spacers, and a 10 ft long seal assembly.



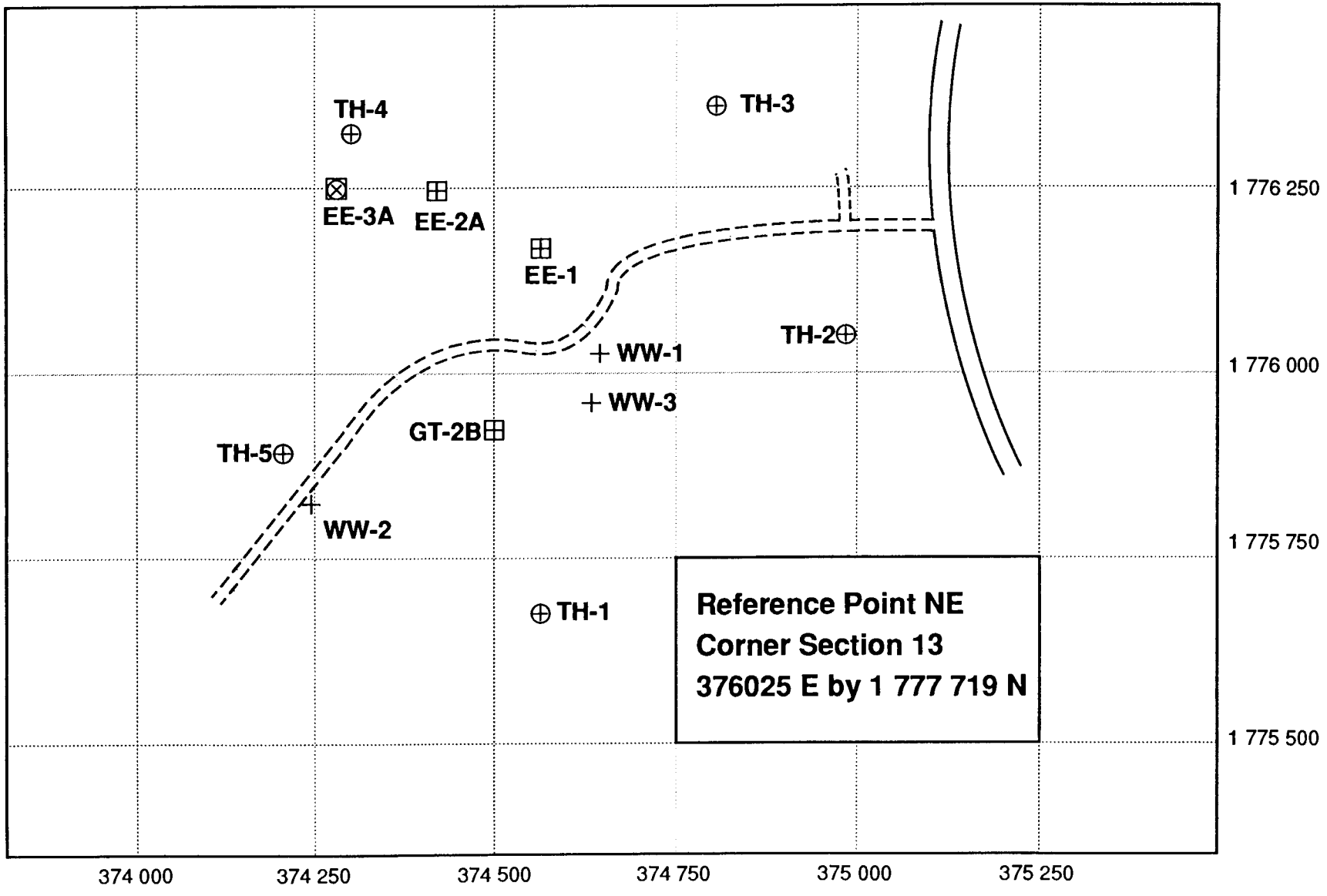
Gradient Shown is derived from measurements in GT-2, EE-1, and EE-2

Generalized geological section and static conductive temperature profile at Fenton Hill.

Plat of Wells within 1 Mile of Injection Well EE-3A, 1755 FEL,1417 FNL, Sec. 13, T 19N, R2EFenton Hill, Hot Dry Rock Geothermal Site, Sandoval County, New Mexico



Surface Locations for Plat of all Wells on the Fenton Hill Site



ATTACHMENT TO PLAT

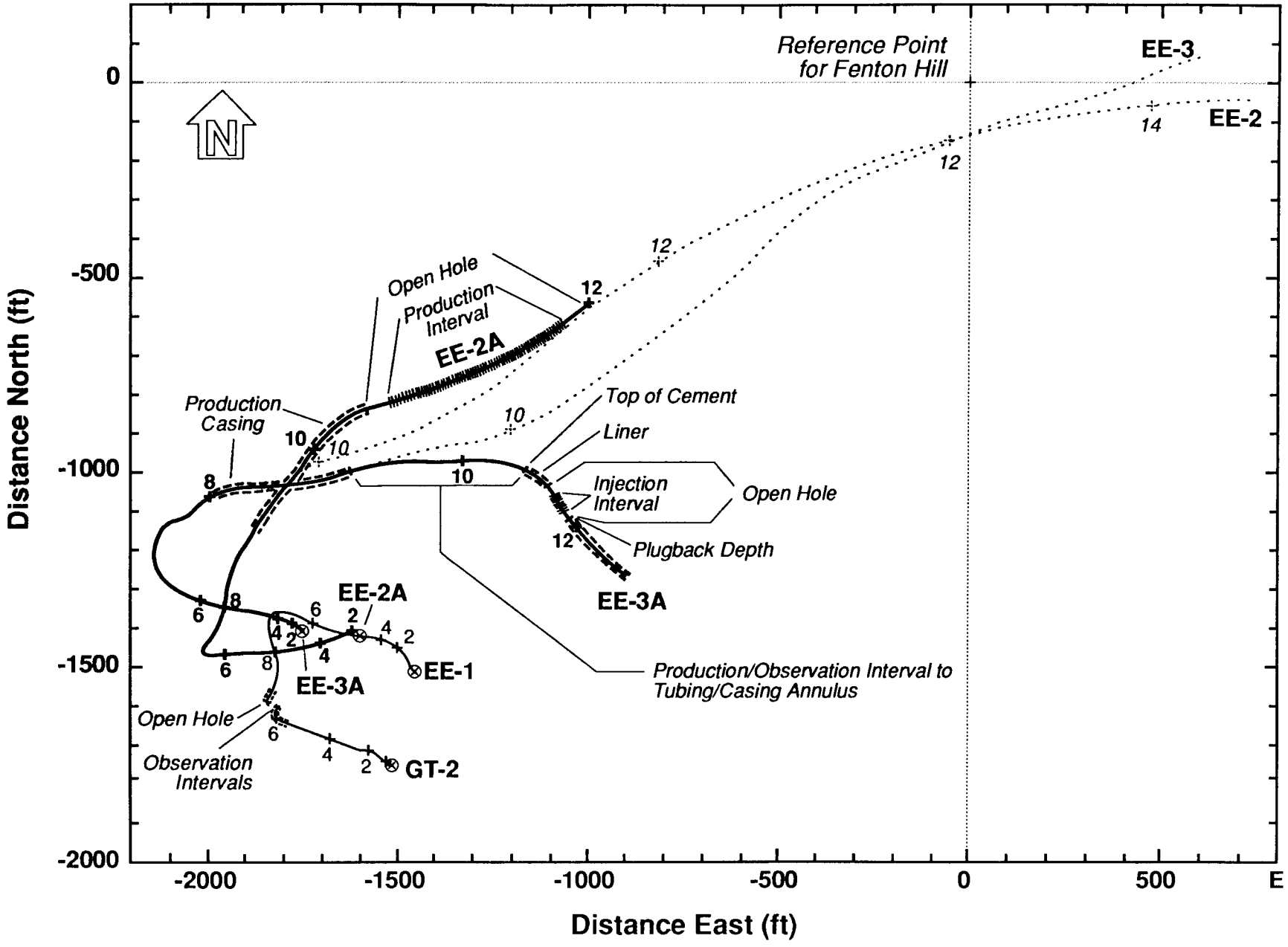
WELL	SURFACE LOCATION	TOTAL DEPTH (ft)	OPEN HOLE/ PERFORATIONS (ft-ft)	STATUS
EE-1	1462 FEL, 1503 FNL, SEC 13 T19N, R2E, Sandoval Co., NM	10053	9599-10053	Instrument test & observation well
EE-2	1603 FEL, 1428 FNL, SEC 13 T19N, R2E, Sandoval Co., NM	15289	none	Plugged back to 9722 ft & redrilled as EE-2A
EE-2A	same as EE-2	12360	10775-12360	HDR production well
EE-3	1755 FEL, 1417 FNL, SEC 13 T19N, R2E, Sandoval Co., NM	13933	none	Plugged back to 9372 ft & redrilled as EE-3A
EE-3A	same as EE-3	13182	9285-10950	Open to annulus observation zone
			11436-12107	Open to tubing HDR injection zone
GT-2	1524 FEL, 1747 FNL, SEC 13 T19N, R2E, Sandoval Co., NM	9607	none	Plugged back to 8200 ft & redrilled as GT-2A
GT-2A	same as GT-2	9184	none	Plugged back to 8238 ft & redrilled as GT-2B
GT-2B	same as GT-2	8909	8572-8909	HDR observation well
			2535-7000	
PC-1	2013 FWL,* 2149 FSL,* SEC 18 T19N, R3E, Sandoval Co., NM	2178	2150-2178	Geophone station
PC-2	868 FWL,* 2195 FSL,* SEC 13 T19N, R2E, Sandoval Co., NM	1825	None	Geophone station
WW1 FH-1	(1379 FEL, 1642 FNL,)** SEC 13 T19N, R2E, Sandoval Co., NM	450	389-449 7" @ 390 5-5/8" slotted liner @ 449	Active water well RG-24834
WW2 FH-2	(1779 FEL, 1851 FNL,) SEC 13 T19N, R2E, Sandoval Co., NM	450	372-431 16" @ 450	Inactive water well
WW3 FH-3	(1770 FEL. 1922 FNL,) SEC 13 T19N, R2E, Sandoval Co., NM	460	16"	Nonproducing water well

TEST HOLE A	NE/4,NW/4,SW/4 SEC 18 T19N, R3E, Sandoval Co. NM	590	478-590 4-1/2" casing	Geothermal heat flow measurement hole
TEST HOLE 1	(1471 FEL, 2004 FNL, SEC 13) T19N, R2E, Sandoval Co., NM	450 436	rabbit	Nonproducing observation well
TEST HOLE 2	(1129 FEL, 1627 FNL, SEC 13) T19N, R2E, Sandoval Co., NM	450 402		Nonproducing observation well
TEST HOLE 3	(1226 FEL, 1315 FNL, SEC 13) T19N, R2E, Sandoval Co., NM	450 372		Nonproducing observation well
TEST HOLE 4	(1726 FEL, 1356 FNL, SEC 13) T19N, R2E, Sandoval Co., NM	450 378		Nonproducing observation well
TEST HOLE 5	(1818 FEL, 1851 FNL, SEC 13) T19N, R2E, Sandoval Co., NM	450 418		Nonproducing observation well

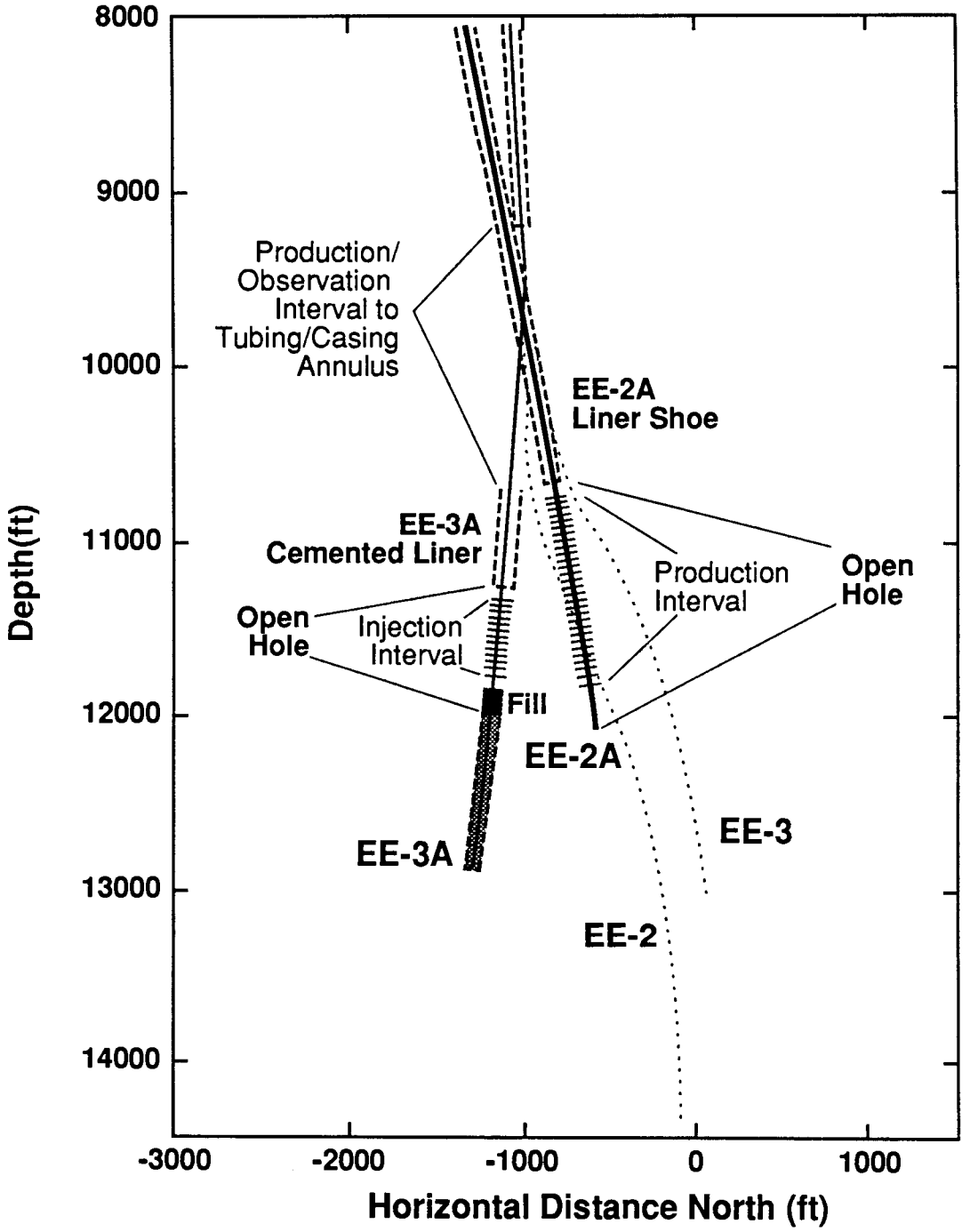
* MEASUREMENTS BASED ON 5280 FT BY 5280 FT SECTION. SURVEY DATA BASED ON REFERENCE TO NE CORNER OF SECTION 13, T19N, R2E.

** MEASUREMENTS IN PARENTHESIS ARE MAP MEASUREMENTS FROM AN ENG-4 MAP BASED ON MEASUREMENTS MADE ON 2/4/1980.

Fenton Hill Site Deep Wells
Planar View



Fenton Hill Site EE-2(A) and EE-3(A) Looking West



Fenton Hill Site EE-2(A) and EE-3(A) Looking North

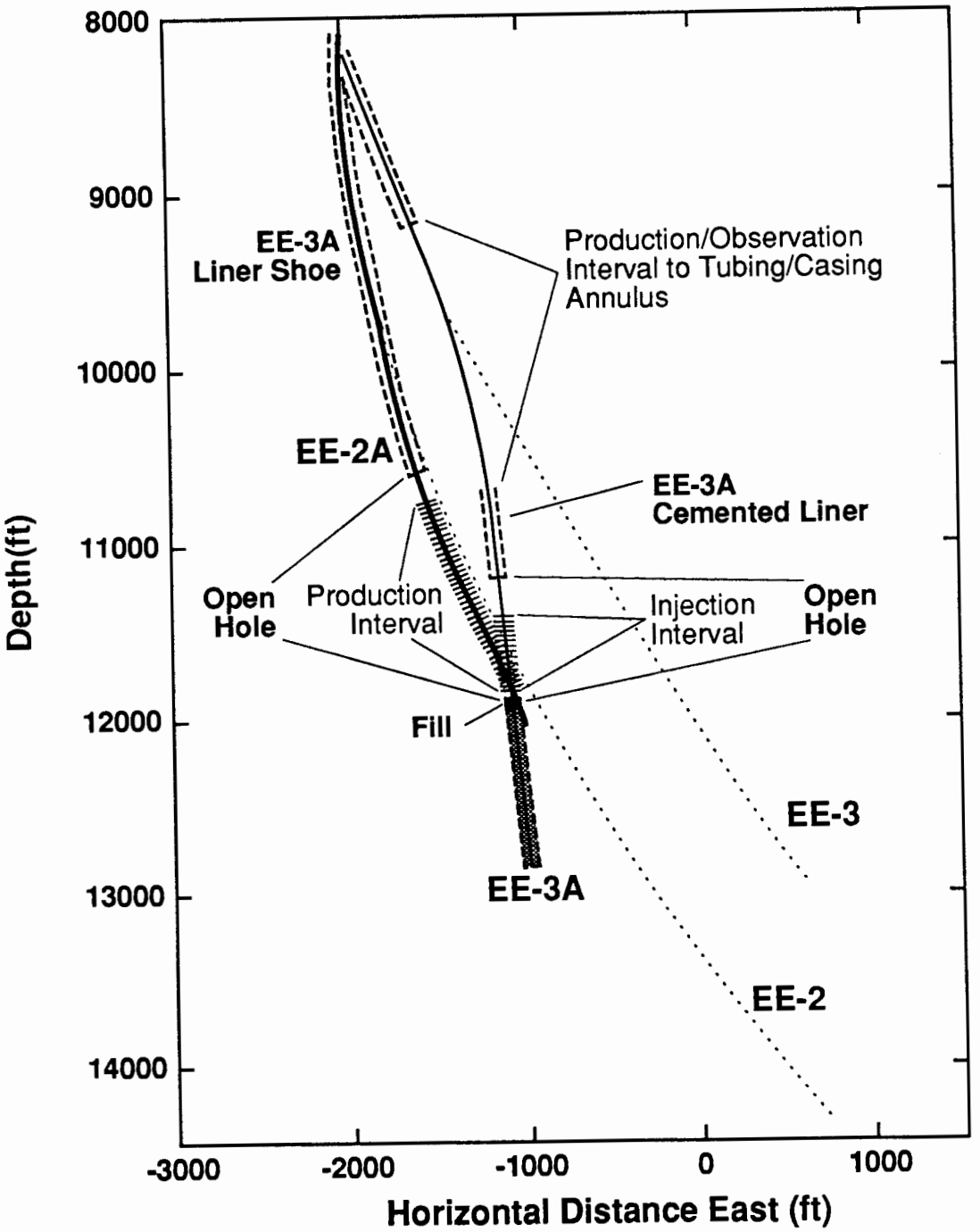


TABLE 1

SUMMARY OF OPEN HOLE PACKER INJECTION TESTS AND
STIMULATION PRIOR TO THE COMPLETION OF WELL EE-3A

Packer Date	Exp. No.	Packer depth[B] (ft)	Hole depth[B] (ft)	Intial pressure[C] (psig)/(min)		Stimulation/MHF[A] pressure/rate (psig)/(BPM)		volume (bbl)	Injection zone top (ft)	bottom[D] (ft)
1985										
4/19	2049	10829	10875	4220	15	5000	6.0	105	10850	10875
5/02	2057	10841	11615	3450	10	4950	6.1	3110	10850	11400
5/27	2059	11537	12203	2740	10	4910	6.2	10060	11700	12100
6/29	2061	12555	13180	4140	10	5650	6.0	32580	13150+	13180
7/17	2062	11976	12550	3480	6	5250	4.7	36310	12000	12500
1986										
1/30	2066	12320	12840	3760	15	6170	6.0	26930	no log run	

A Most of the packer stimulation treatments were initiated with a 1 BPM, 2 BPM, 4 BPM, 6 BPM injection rates of 10 minutes to 2 hour durations. Higher injection rates up tp 12 BPM at 7200 psig followed the stepped rate start up on the largest jobs. The stimulation pressures shown are the surface injection pressures measured following the initial 6 BPM injection. No correction for friction has been made. The volume shown is the total stimulation volume. No proppent was pumped during any fracturing treatment.

B Depths are drill pipe depths referenced to a 37.6 ft KB

C Pressures are surface pressures following 6 to 15 minutes of 1 BPM injection following the installation of the packer. The duration at the time the pressure was read is shown.

D The injection zone was picked from temperature logs. Depths are wire line depths. Corrections to indicate drill pipe depth have not been applied and may be as high as 30 ft.

IN REPLY REFER TO:
3200(943C-2jam)

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
NEW MEXICO STATE OFFICE
Post Office and Federal Building
P.O. Box 1449
Santa Fe, New Mexico 87504-1449

Mr. James H. Albright
EES-4, MS - D443
Los Alamos National Laboratory
Los Alamos, NM 87545

Dear Mr. Albright:

This letter is to inform you of activities for geothermal leasing in T. 19 N., R. 2 E., sections 11, 12, 13, 14, 23 and 24, and T. 19 N., R. 3 E., NMPM, sections 7, 18, and 19.

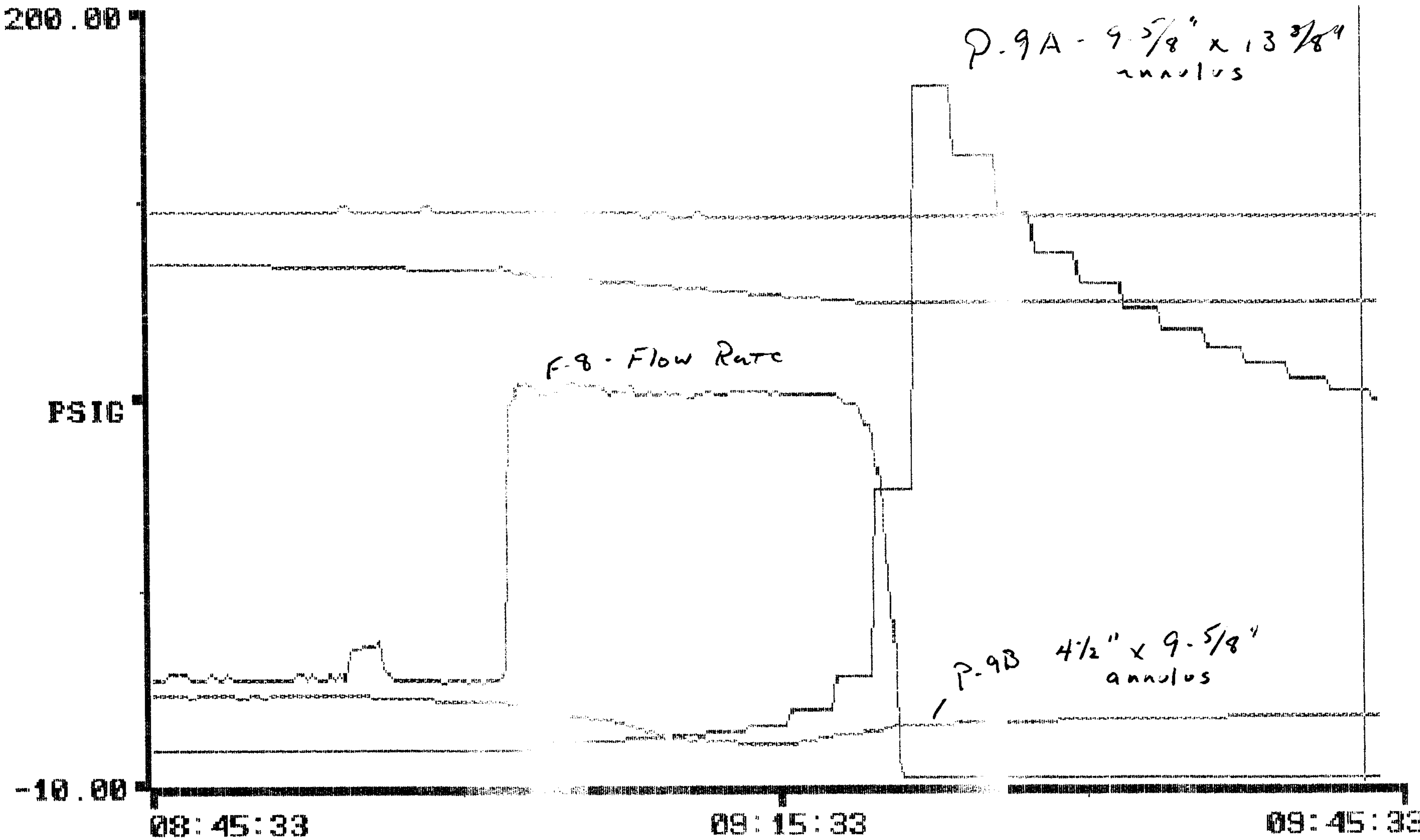
Our records show that there are no active leases in these areas. The active geothermal leases in New Mexico are all located in the southern part of the state.

If you need further information, please call Jackie Morales at (505) 988-6038.

Sincerely yours,

Clarence F. Hougland

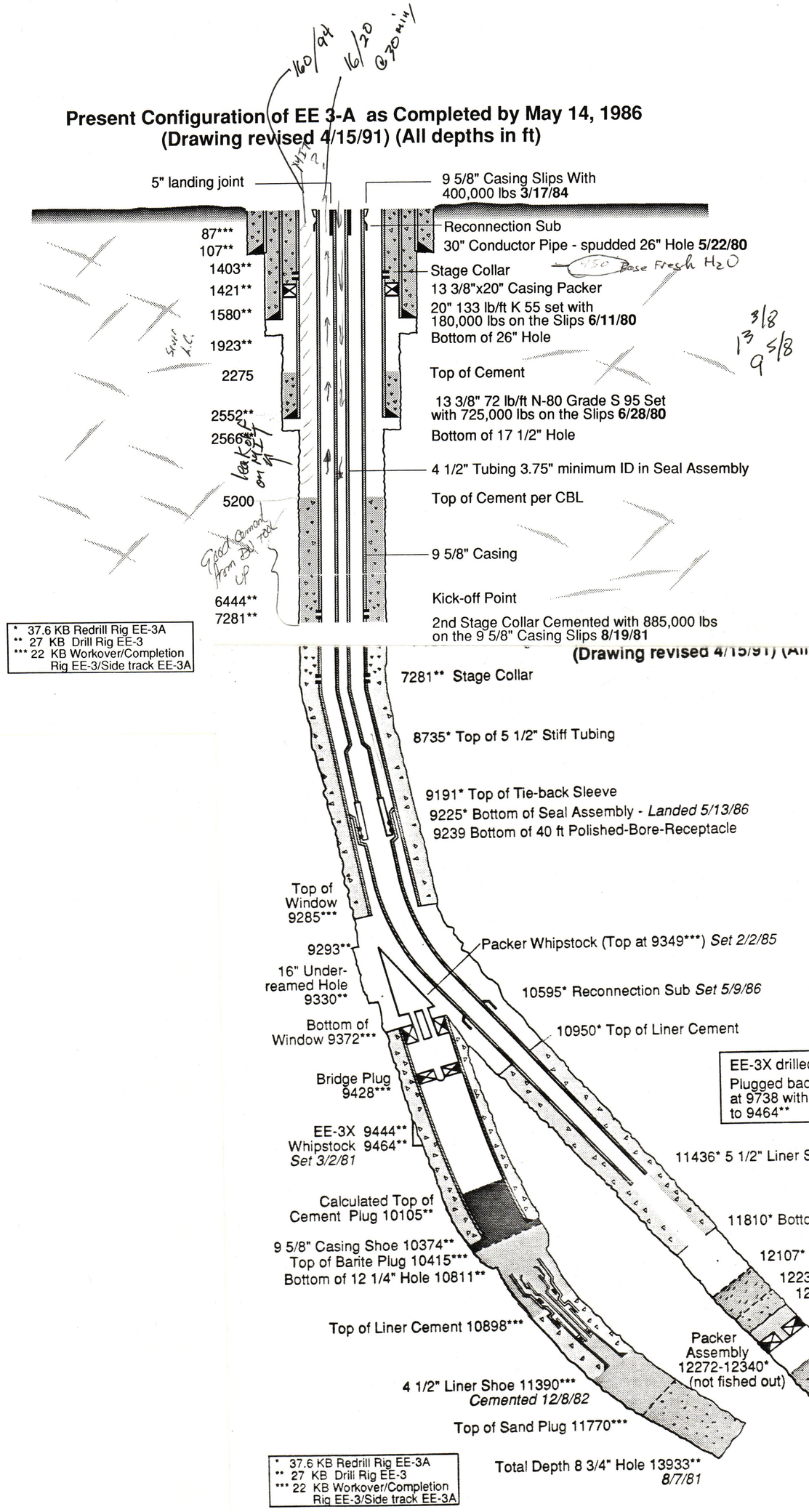
Clarence F. Hougland
Chief, Lands & Mining Unit



DAT2	P-9A	F_CV	SAMPLE	96.10	PSIG	
DAT2	P-9B	F_CV	SAMPLE	19.95	PSIG	
DAT2	P-9	F_CV	SAMPLE	46.25	psig	LOLO
DAT2	F-8	F_CV	SAMPLE	1.10	gpm	
DAT2	FLS-2	F_CV	SAMPLE	23.86	"WC	

5:20 09:43 9 03-02-94

Present Configuration of EE 3-A as Completed by May 14, 1986
(Drawing revised 4/15/91) (All depths in ft)



STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **JUNE, 1995**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL.	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	16.48	3960 psi	86.9°F	183.0 Acre-feet	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLO FROM INJECTIO WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

Title: **TECHNICAL STAFF MEMBER** Date: **08/02/95**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **MAY 1995**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	13.53	3937 psi	76.7°F	166.5 Acre-feet	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLO FROM INJECTIO WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
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Remarks: _____

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

Title: **TECHNICAL STAFF MEMBER** Date: **08/02/95**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **April, 1995**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL.	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	0.50	2861 psi	45.9°F	152.97 Acre-feet	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLO FROM INJECTIO WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
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Remarks: _____

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

Title: **TECHNICAL STAFF MEMBER** Date: **8/1/95**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **MARCH, 1995**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	1.49	2543 psi	41.1°F	152.47 Acre-feet	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLO FROM INJECTIO WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
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I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks: _____

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

Title: **TECHNICAL STAFF MEMBER**

Date: **8/1/95**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of FEBRUARY 1995

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL.	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	0.41	2025 psi	40.3°F	150.98 acre-feet	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
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I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks: _____

Name: DON BROWN

Company: LOS ALAMOS NATIONAL LABORATORY

Title: TECHNICAL STAFF MEMBER

Date: 7/26/95

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	0.59	1705 psi	37° F	150.58 Acre-feet	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
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Remarks: _____

Name: DON BROWN

Company: LOS ALAMOS NATIONAL LABORATORY

Title: TECHNICAL STAFF MEMBER Date: 7/16/95

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **DECEMBER 1994**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	0.53	1671 psi	40° F	149.98 Acre-feet	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

Title: **TECHNICAL STAFF MEMBER** Date: **7/14/95**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **NOVEMBER 1994**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	0.61	1390 psi	42°	149.45 acre-feet	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: DON [illegible]OWN

Company: LOS ALAMOS NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **OCTOBER 1994**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	1.21	2430PSI	52°	148.84 ACRE-FEET	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

RECEIVED
'94 DEC 7 AM 8 52

Month of SEPTEMBER 1994

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	0.81	2283 psi	64°F	147.63 ACRE-FEET	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TALS											

1. is injection into a producing zone for the purpose of building up or maintaining pressure,
injection into a zone other than a producing zone for disposal purposes,

by certify that the above is true and complete to the best of my knowledge and belief.

Name DON BROWN

LOS ALAMOS NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **AUGUST 1994**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	0.22	1917 psi	68°F	146.81 acre-feet	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: **DON BROWN**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of JULY, 1994

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL.	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
E3A	G	13	19W	2E	PM	0.30	2109 psi	70° F	146.59 acre-feet	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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Remarks: _____

Name: DON BROWN

Company: LOS ALAMOS NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

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Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of JUNE, 1994

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	1.22	1820 psi	62°F	146.29 (Acre-ft)	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: DON BROWN

LOS ALAMOS NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

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Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **MAY, 1994**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	1.02	1240 psi	49° F	145.08	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: Reservoir injection averaged about 7.5 gpm for May

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

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SANTA FE, NEW MEXICO 87501

Form G-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **April, 1994**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL.	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	0.18	860 psi	54°F	144.06	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW 1 WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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Remarks: **Reservoir injection begun again on April 6, but at a very low rate of about 2 gpm (Avg.)**

Name **DON BROWN**

Company **LOS ALAMOS NATIONAL LABORATORY**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

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SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of: DECEMBER, 1993

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
3E3A	G	13	19W	2E	PM					PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: RESERVOIR INJECTION TERMINATED MAY 17, 1993 INJECTION WILL NOT BE RESUMED UNTIL FURTHER NOTICE

Name: DON BROWN

LOS ALAMOS NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of: NOVEMBER, 1993

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM					PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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Remarks: RESERVOIR INJECTION TERMINATED, MAY 17, 1993 Name: DON BROWN

INJECTION WILL NOT BE RESUMED UNTIL FURTHER NOTICE. LOS ALAMOS NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

MONTHLY GEOTHERMAL INJECTION REPORT

Form G-110
Adopted 10-1-74
Revised 10-1-78

Month of OCT. 1993

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
3E3A	G	13	19W	2E	PM	-0-	N/A	N/A	143.9	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: RESERVOIR INJECTION TERMINATED MAY 17, INJECTION WILL NOT BE RESUMED UNTIL FURTHER NOTICE

Name: DON BROWN

Company: LOS ALAMOS NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

MONTHLY GEOTHERMAL INJECTION REPORT

Form C-110
Adopted 10-1-74
Revised 10-1-78

Month of SEPT., 1993

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	-0-	N/A	N/A	143.9	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FL FROM INJECTI WELL ANNULUS 4. RAIN AND SNC MELT IN WATE STORAGE POND 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.
D. is injection into a zone other than a producing zone for disposal purposes.
I hereby certify that the above is true and complete to the best of my knowledge and belief.

Remarks: RESERVOIR INJECTION TERMINATED MAY 17, INJECTION WILL NOT BE RESUMED UNTIL

Name: DON BROWN

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

MONTHLY GEOTHERMAL INJECTION REPORT

Form G-110
Adopted 10-1-74
Revised 10-1-78

Month of AUG 1993

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	-0-	N/A	N/A	143.9	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FL FROM INJECTI WELL ANNULUS 4. RAIN AND SNO MELT IN WATE STORACE POND 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: RESERVOIR INJECTION TERMINATED MAY 17, INJECTION WILL NOT BE RESUMED UNTIL

Name: DON BROWN

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **JULY 1993**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	-0-	N/A	N/A	143.9	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

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D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: **RESERVOIR INJECTION TERMINATED MAY 17, INJECTION WILL NOT BE RESUMED UNTIL FURTHER NOTICE**

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

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MONTHLY GEOTHERMAL INJECTION REPORT

Month of **JUNE 1993**

Operator **LOS ALAMOS NATIONAL LABORATORY**

Address **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name **HOT DRY ROCK GEOTHERMAL SITE**

Field **FENTON HILL**

County **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	-0-	N/A	N/A	143.9	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

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D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: **RESERVOIR INJECTION TERMINATIED**

Name **DON BROWN**

MAY 17. INJECTION WILL NOT BE RESUMED UNTIL

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

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SANTA FE, NEW MEXICO 87501

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MONTHLY GEOTHERMAL INJECTION REPORT

Month of **MAY 1993**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	7.75	3841 psi	69°F	143.9	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: RESERVOIR INJECTION TERMINATED MONDAY MORNING, MAY 17. INJECTION WILL NOT BE

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **MARCH 1993**

Operator **LOS ALAMOS NATIONAL LABORATORY**

Address **ATTENTION: JIM ALBRIGHT**
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name **HOT DRY ROCK GEOTHERMAL SITE**

Field **FENTON HILL**

County **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	13.73	3932 psi	72°F	127.2	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name **DON BROWN**

Company **LOS ALAMOS NATIONAL LABORATORY**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **FEBRUARY 1993**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	6.59	3890 psi	74° F	113.47	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **JANUARY 1993**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	2.87	3560 psi	54° F	106.89	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLO FROM INJECTIO WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of DECEMBER 1992

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	13.77	3880 psi	59°F	104.01	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: DON BROWN

Company: LOS ALAMOS NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of: NOVEMBER 1992

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
?E3A	G	13	19W	2E	PM	9.06	3788psi	56° F	90.25	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____ Name DON BROWN

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of: OCTOBER 1992

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location Ul.	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
3A	G	13	19W	2E	PM	1.70	3424 psi	62°F	81.19	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: INJECTION WAS SHUT IN FOR ALL EXCEPT THREE DAYS IN OCTOBER.

Name: DON BROWN

Company: LOS ALAMOS NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **SEPTEMBER 1992**

Operator **LOS ALAMOS NATIONAL LABORATORY**

Address **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name **HOT DRY ROCK GEOTHERMAL SITE**

Field **FENTON HILL**

County **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	6.41	3244 psi	69.6°F	79.49	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name **DON BROWN**

Company **LOS ALAMOS NATIONAL LABORATORY**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of AUGUST 1992

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	4.08	3298 psi	67.7°F	73.08	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW 1 WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: DON BROWN

Company: LOS ALAMOS NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of JULY 1992

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location Unit	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	C	13	19W	2E	PM	14.30	3947 psi	67.5°F	69.00	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

(A) is injection into a producing zone for the purpose of building up or maintaining pressure

(B) is injection into a zone other than a producing zone for disposal purposes

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

Remarks

Name: DON BROWN

Company: LOS ALAMOS NATIONAL LABORATORY

OIL CONSERVATION DIVISION

P. O. BOX 2088

FE NEW MEXICO 87501

ERMAL INJECTION REPORT

Form G-110
Adopted 10-1-74
Revised 10-1-78

JUNE, 1992

MS 87545

Source of Water
1. EE 2A PHASE II RESERVOIR PRODUCTION WELL
2. WW I WATER WELL
3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS
4. RAIN AND SNOW MELT IN WATER STORAGE PONDS
. STORAGE POND WATER INVENTORY

LOS A NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **MAY 1992**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	15.81	3860 psi	62°F	39.57	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW 1 WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
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Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **MAY 1992**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	15.81	3860 psi	62°F	39.57	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW 1 WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

OIL CONSERVATION DIVISION

SANTA FE, NEW MEXICO 87501

MONTHLY GEOTHERMAL INJECTION REPORT

Month of APRIL 1992

Operator [illegible]

Lease Name HOT DRY ROCK GEOTHERMAL SITE

Field FENTON HILL

County SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Avg. Psi Inj. Pres.	Avg. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	10.76	3650 psi	67°	23.76	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A [illegible] FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. [illegible] WATER INVENTORY
TOTALS											

*P: Injection into a producing zone for the purpose of building up or maintaining pressure.

D: Injection into a zone other than a producing zone for disposal purposes.

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

Remarks: ______________________

Name DON BROWN

Company [illegible]

Title TECHNICAL STAFF MEMBER

Date 5/28/92

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of APRIL 1992

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location Unit	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	10.76	3650 psi	67°	23.76	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks:

Name: DON BROWN

Company: LOS ALAMOS NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form G-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of MARCH, 1992

Operator: LOS ALAMOS NATIONAL LABORATORY

Address: ATTENTION: JIM ALBRIGHT
MS D443 LOS ALAMOS, NEW MEXICO 87545

Lease Name: HOT DRY ROCK GEOTHERMAL SITE

Field: FENTON HILL

County: SANDOVAL

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	G	13	19W	2E	PM	5.57	3790 PSI	67°F	13.00	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLOW FROM INJECTION WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: DON BROWN

Company: LOS ALAMOS NATIONAL LABORATORY

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **February**

Operator: **LOS ALAMOS NATIONAL LABORATORY**

Address: **ATTENTION: JIM ALBRIGHT MS D443 LOS ALAMOS, NEW MEXICO 87545**

Lease Name: **HOT DRY ROCK GEOTHERMAL SITE**

Field: **FENTON HILL**

County: **SANDOVAL**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE3A	C	13	19W	2E	PM	4.10	3910 psi	64°F	7.43	PHASE II RESERVOIR	1. EE 2A PHASE II RESERVOIR PRODUCTION WELL 2. WW I WATER WELL 3. EE-3A BS PHASE II RESERVOIR FLO FROM INJECTIO WELL ANNULUS 4. RAIN AND SNOW MELT IN WATER STORAGE PONDS 5. STORAGE POND WATER INVENTORY
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: _____

Name: **DON BROWN**

Company: **LOS ALAMOS NATIONAL LABORATORY**

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of **January, 1992**

Operator: Los Alamos National Laboratory
Address: **Attention: Jim Albright** MS M/S [illegible], Los Alamos, New Mexico 87545

Lease Name: **Hot Dry Rock Geothermal Site**
Field: **Fenton Hill**
County: **Sandoval**

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE 3A	G	13	19W	2D	PI	1.404	4110 psi	47°F	3.337	Phase II Reservoir	1. EE 2A: Phase II Reservoir Production Well 2. WW 1 Water Well 3. EE-3A BS Phase II Reservoir flow from injection well annulus 4. Rain and snow melt in water storage ponds 5. Storage pond water inventory
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: 2nd report

Name: Don Brown

Application to Inject Approved on 12/2/91

Company: Los Alamos National Laboratory

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-118
Adopted 10-1-74
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of: December 1991

Operator: Los Alamos National Laboratory

Address: Attention: Jim Albright
MS D443 Los Alamos, New Mexico 87545

Lease Name: Hot Dry Rock Geothermal Site

Field: Fenton Hill

County: Sandoval

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj.	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
EE 3A	G	13	19W	2E	PM	1.873	3880psi	50°F	1.873	Phase II Reservior	1. EE 2A: Phase II Reservior Production well 2. WW I Water Well 3. EE-3A BS Phase II Reservior flow from injection well annulus 4. Rain and snow melt in water storage ponds 5. Storage pond water inventory
TOTALS											

P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

D. is injection into a zone other than a producing zone for disposal purposes.

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

Remarks: 1st report

Name: Don Brown

Appli ti- to Inject Approved on 12-2-91

Company: Los Alamos National Lab

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-110
Adopted 10-1-24
Revised 10-1-78

MONTHLY GEOTHERMAL INJECTION REPORT

Month of December 1991

Operator: Los Alamos National Laboratory

Address: Attention: Jim Albright MS D443 Los Alamos, New Mexico 87545

Lease Name: Hot Dry Rock Geothermal Site

Field: Fenton Hill

County: Sandoval

Well No.	Location UL	S	T	R	P.M. or D.	Acre Feet Water Inj	Ave. Surf. Inj. Pres.	Ave. Temp. Inj. Wtr.	Cumulative Water Inj.	Name of Inj. Zone	Source of Water
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P.M. is injection into a producing zone for the purpose of building up or maintaining pressure.

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Remarks: 1st report

Name: Don Brown