GTLT - 2

NMSU GD-2 LRG-3648
UL:D 27-23S-02E
Dona Ana County

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

July 11, 1988

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. C. D. Black
Physical Plant Department
New Mexico State University] Box 3545
Las Cruces, New Mexico 88003-3545

RE: Discharge Plan GW-38
New Mexico State University
NMSU Geothermal Wells PG-1 and PG-4
Las Cruces, Dona Ana County

Dear Mr. Black:

On December 22, 1986, the ground water discharge plan, GW-38, for NMSU Geothermal wells PG-1 and PG-4 located in Dona Ana County, was approved by the Director of the Oil Conservation Division (OCD). This discharge plan was required and submitted pursuant to Water Quality Control Commission Regulations and it was approved for a period of two years. The approval will expire on December 22, 1988.

If your facility continues to have effluent and leachate discharges and you wish to continue discharging to the unlined pit, please submit your application for renewal of plan approval as quickly as possible. The OCD is reviewing discharge plan submittals and renewals carefully and the review time can often extend for several months. Please indicate whether you have made, or intend to make, any changes in your discharge system, and if so, include an application for plan amendment with your application for renewal. To assist you in preparation of your renewal application, I have enclosed a copy of the OCD's guidelines for preparation of ground water discharge plans at geothermal installations. These guidelines will be used in review of your renewal application.

If you no longer have such discharges and discharge plan renewal is not needed, please notify this office.

If you have any questions, please do not hesitate to contact Jami Bailey at (505) 827-5884

Sincerely,

David G. Boyer, Chief
Environmental Bureau

DGB:JB:sl

Enclosure

cc: OCD - District IV

NEW MEXICO OIL CONSERVATION COMMISSION

Form G-112
Adopted 10-1-74

P. O. Box 2088, Santa Fe 87501

APPLICATION TO PLACE WELL ON INJECTION-GEOTHERMAL RESOURCES AREA

DEC 27 1982

Operator		Address		
New Mexico State University		Box 3445 New Mexico State University		
Lease Name	Well No.	Field		County
N/A	GD-2, LRG3648	NMSU		Dona Ana

Location

Unit Letter D ; Well is Located 330 Feet From The West Line And 1,000 Feet From The North Line, Section 27 Township 23 S Range 2 E NMPM.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
Conductor Pipe					
Surface Casing					
Long String	8 5/8"	370 feet	200	Ground surface	Positive return
Tubing Screen	8 5/8"	390-470 370-380	Name, Model and Depth of Tubing Packer: Johnson wire round screen, type 316L SS, 0.60 slots		

Name of Proposed Injection Formation	Top of Formation	Bottom of Formation
Santa Fe	250	990 feet

Is Injection Through Tubing, Casing, or Annulus?	Perforations or Open Hole?	Proposed Interval(s) of Injection
Thru screen	screen	370-380 390-470

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

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

Depth of Bottom of Deepest Fresh Water Zone in This Area	Is This Injection for Purpose of Pressure Maintenance or Water Disposal? (See Rules 501 and 502)
None	water disposal

Anticipated Daily Injection Volume	Minimum	Maximum	Open or Closed Type System	Is Injection to be by Gravity or Pressure?	Approx. Pressure (psi)
370,000gpd	150,00gpd	370,000gpd	closed	gravity	

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

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

New Mexico State University

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

(New Mexico State University)

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

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

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

(Signature)	Director, Physical Plant Deptartment (Title)	12-22-82 (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 Commission will hold the application for a period of 20 days from the date of receipt by the Commission'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.

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501

Form G-104
Adopted 10/1/74

CERTIFICATE OF COMPLIANCE AND AUTHORIZATION TO PRODUCE GEOTHERMAL RESOURCES

OWNER OR OPERATOR
Name New Mexico State University

DEC 27 1982
RECEIVED

Address Box 3445 New Mexico State University

TYPE OF WELL
Geothermal Producer [ ] Low-Temperature Thermal [ ] Injection/Disposal [X]

REASON FOR FILING
New Well [X] Recompletion [ ]
Change in Ownership [ ] Designation of Purchaser [ ]
Other (Please Explain) [ ] _____

DESCRIPTION OF WELL
Lease Name N/A Well No. NMSU GD-2 LRG 3648 Name of Reservoir New Mexico State University
Kind of Lease (Fee, Fed. or State) N/A Lease Number N/A

LOCATION
Unit Letter D ; 330 feet from the West line and 1,000 feet from the North line of
Section 27 Township 23 S Range 2 E
County _____

TYPE OF PRODUCT
Dry Steam _____ Steam and Water _____ Low Temp. Thermal Water X

DESIGNATION OF PURCHASER OF PRODUCT
Name of Purchaser N/A
Address of Purchaser _____
Product Will Be Used For _____

CERTIFICATE OF COMPLIANCE
I hereby certify that all rules and regulations concerning geothermal resources wells in the State of New Mexico, as promulgated by the Oil Conservation Commission of New Mexico, have been complied with, with respect to the subject well, and that the information given above is true and complete to the best of my knowledge and belief.

Signed _____ Position Director, PPD Date 12-22-82
Approved _____ Position Div. Director Date 12/30/82

Form G-105
Adopted 10/1/74

NEW MEXICO OIL CONSERVATION COMMISSION

P. O. Box 2088, Santa Fe 87501

GEOTHERMAL RESOURCES WELL LOG

DEC 27 1982

RECEIVED

Operator New Mexico State University

Address Box 3445 New Mexico State University

Reservoir NMSU

Lease Name N/A Well No. GD-2 LRG-3648 Unit Letter D

Location: 330 feet from the West line and

1,000 feet from the North line Section 27

Township 23 S Range 2 E County Dona Ana

FORMATIONS PENETRATED BY WELL

DEPTH TO		Thickness	Drilled or Cored	Recovery	DESCRIPTION
Top of Formation	Bottom of Formation				
G.S.	725	725 feet	Drilled	Cutting	Santa Fe fill
725	790	65 feet	Drilled	Cutting	Clay and finely divided sand (Santa Fe group)
790	990	200 feet	Drilled	Cutting	Santa Fe fill

Attach Additional Sheets if Necessary

This form must be accompanied by copies of electric logs, directional surveys, physical or chemical logs, water analyses, tests, and temperature surveys (See Rule 205).

CERTIFICATION

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief.

Signed [signature] Position Director, PPD Date 12-22-82

Form G-106
Adopted 10/1/74

NEW MEXICO OIL CONSERVATION COMMISSION

P. O. Box 2088, Santa Fe 87501

DEC 27 1982

GEOTHERMAL RESOURCES WELL SUMMARY REPORT

Operator New Mexico State University — Address Box 3445 New Mexico State University

Lease Name NMSU — Well No. NMSU-GD-2 LRG 3648

Unit Letter D — Sec. 27 — Twp. 23 S — Rge 2 E

Reservoir NMSU — County Dona Ana

Commenced drilling 23 September 1982

Completed drilling 22 October 1982

Total depth 990 — Plugged depth 477-990

Junk N/A

Commenced producing N/A (Date)

GEOLOGICAL MARKERS	DEPTH
Clay zone	725-790
Rhyolite gravel	810-990

Geologic age at total depth: 1.0 million years

Date	Static test Shut-in well head		Production Test Data								
			Total Mass Flow Data					Separator Data			
	Temp. °F	Pres. Psig.	Lbs/Hr	Temp. °F	Pres. Psig.	Enthalpy	Orifice	Water cuft/Hr	Steam Lbs/Hr	Pres. Psig.	Temp. °F

CASING RECORD (Present Hole)

Size of Hole	Size of Casing	Weight of Csg/ft.	Grade of Casing	New or Used	Seamless or Lapweld	Depth of Shoe	Top of Casing	Number of Sacks Cement	Top of Cement	Cement Top Determined By
14 3/4"	8 5/8"		A120	New	Seamless	347'	1' above ground	200	ground surface	Cement returns

PERFORATED CASING

(Size, top, bottom, perforated intervals, size and spacing of perforation and method.)

8 5/8-inch Johnson stainless steel type 316L, wire round, 0.60 inch slots, 1½ by 3-inch collars, from 370 to 380 feet, and 390 to 470 feet.

Was analysis of effluent made? yes — Electrical log depths 990 feet — Temperature log depths 990 feet

CERTIFICATION

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief.

Signed [signature] Position Director, PPD Date 12-22-82

Form G-107
Adopted 10/1/74

NEW MEXICO OIL CONSERVATION COMMISSION

P. O. Box 2088, Santa Fe 87501

DEC 27 1982

RECEIVED

GEOTHERMAL RESOURCES WELL HISTORY

Operator New Mexico State University Address Box 3445 New Mexico State University

Lease Name _____ Well No. NMSU GD-2 LRG 3648

Unit Letter D Sec. _____ Twp. 23S Rge 2E

Reservoir New Mexico State University County Dona Ana

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting, and initial production data and zone temperature. (Attach additional sheets if necessary.)

Date	
23 Sep 82	Spudded well; pilot hole drilled 7 7/8-inch diameter to 520 feet and 6 1/2-inch to 991 feet.
6 Oct 82	Pilot hole logged by Century Geophysical.
6-7 Oct 82	Pilot hole packed with gravel, and water samples were jetted from 840 feet and 468 feet of depth. Jetting continued for 6 hours at each horizon to assure representative samples were attained. Water temp. 88°F.
11-15 Oct 82	Pilot hole reamed to 14 3/4-inch diameter to 486 feet.
21-22 Oct 82	Casing and screen set, with perforated zones 370 to 380 feet, and 390 to 470 feet. Blank casing 0-370, 380-390, and 470 to 477. Bottom cement plug set (20 sacks of cement) from 464 to 486 feet. Gravel set from 464 to 348 feet. Casing cemented with 200 sacks of cement through gravel tube. Good cement returns at surface from 347 feet to surface.
25-28 Oct 82	Well developed by air jetting. Flow cleared in 6 hours. Approximately 100 gpm air jetted for 6 hours each of four days.
1-5 Nov 82	Well test pumped at 100-150 gpm for total of 24 hours.
15-24 Nov 82	Well re-developed by air jetting for a total of 48 hours.
29-30 Nov 82	Well head installed, and connection made to geothermal disposal pipeline.
1-15 Dec 82	Fifteen day controlled test reinjection. Flow maintained at 220-240 gpm. Gravity reinjection.

CERTIFICATION

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief.

Signed _____ Position Director, P.P.D. Date 12-22-82

Form G-101
Adopted 10/1/74

NO. OF COPIES RECEIVED		
DISTRIBUTION		
File	1	✓
N.M.B.M.	1	
U.S.G.S.		
Operator	1	
Land Office		

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK---GEOTHERMAL RESOURCES WELL

5. Indicate Type of Lease: STATE ☐ FEE ☒
5.a State Lease No.: N/A

1a. Type of Work: Drill ☐ Deepen ☐ Plug Back ☐

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

7. Unit Agreement Name: N/A

8. Farm or Lease Name: NMSU Property

2. Name of Operator: New Mexico State University

9. Well No.: GD-2

3. Address of Operator: Box 3445 New Mexico State University

10. Field and Pool, or Wildcat: NMSU

4. Location of Well: UNIT LETTER D LOCATED 330 FEET FROM THE West LINE AND 1,000 FEET FROM THE North LINE OF SEC. 27 TWP. 23 S RGE. 2E NMPM

12. County: Dona Ana

19. Proposed Depth	19A. Formation	20. Rotary or C.T.
500	Santa Fe	Rotary

21. Elevations (Show whether DF, RT, etc.)	21A. Kind & Status Plug. Bond	21B. Drilling Contractor	22. Approx. Date Work will start
4,000		TBD	TBD

PROPOSED CASING AND CEMENT PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	SACKS OF CEMENT	EST. TOP
12 inches	8 5/8 inches				

Pilot hole 6¼-inch will be drilled to TD; hole will be logged by commercial logging company; pilot hole will be enlarged to 12 inches. Johnson wire screen, stainless steel, or equivalent will be placed after gravel pack, diameter 8 5/8". Casing will be cemented from screen section to ground level.

APPROVAL VALID FOR 90 DAYS
PERMIT EXPIRES 11/15/82
UNLESS DRILLING UNDERWAY

OIL CONSERVATION COMMISSION TO BE NOTIFIED WITHIN 24 HOURS OF BEGINNING OPERATIONS

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. Give blowout preventer program, if any.

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

Signed C.D. Black Title Director, Physical Plant Dept. Date June 30, 1982

(This space for State Use)

APPROVED BY Carl Ulvog TITLE DISTRICT SUPERVISOR DATE 8-17-82

CONDITIONS OF APPROVAL, IF ANY:

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

Form G-102
Adopted 10/1/74

GEOTHERMAL RESOURCES WELL LOCATION AND ACREAGE DEDICATION PLAT

All distances must be from the outer boundaries of the Section.

Operator	Lease	Well No.
New Mexico State University	NMSU Land	GD-2

Unit Letter	Section	Township	Range	County
D	27	23S	2E	Dona Ana

Actual Footage Location of Well:
330 feet from the West line and 1,000 feet from the North line Line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
4,000	Santa Fe	NMSU	Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

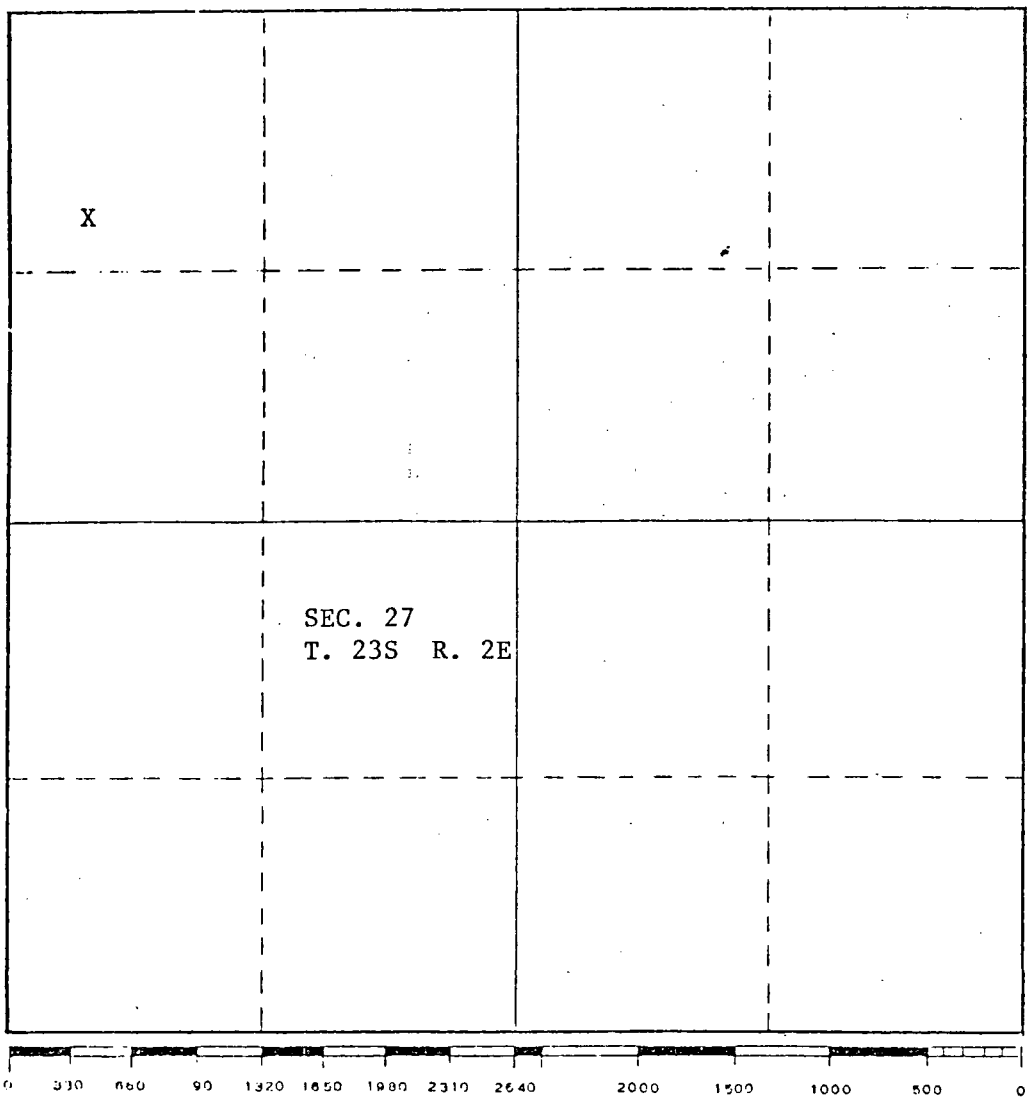
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownersip is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling, etc?

☐ Yes ☐ No If answer is "yes," type of consolidation N/A

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

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

Name C.D. Black

Position Director, Physical Plant Dept

Company New Mexico State University

Date 30 June '82

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed 17 June '82

Registered Professional Engineer and/or Land Surveyor
Owen Lockwood

Certificate No. 6550

PHYSICAL PLANT DEPARTMENT

Box 3545/Las Cruces, New Mexico 88003
Telephone (505) 646-3021

NEW MEXICO STATE UNIVERSITY

December 22, 1982

DEC 27 1982
RECEIVED

Mr. Carl Ulvog
Oil Conservation Commission
P.O. Box 2088
Santa Fe, NM 87501

Dear Mr. Ulvog,

Forwarded for your review and approval are properly completed Forms G-104, G-105, G-106, G-107, and G-112 for New Mexico State University Geothermal Disposal Well.

As you have been notified, this well originally was named and numbered NMSU GD-2. Consistent with our current numbering system, and in compliance with State Engineer numbering system, the well has been renumbered as NMSU GD-2, LRG 3648.

Request permission be granted to place this well on disposal.

Sincerely,

Calvin D. Black
Director, Physical Plant Department

CDB/dhb

Enclosures:

NMSU-GD-2-LRG 3648
G-104
G-105
G-106
G-107
G-112

Form G-103
Adopted 10/1/74

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File		✓
N. M. B. M.		
U. S. G. S		
Operator		
Land Office		

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501

SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

5. Indicate Type of Lease State ☐ Fee ☒
5.a State Lease No. N/A

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: N/A
2. Name of Operator: New Mexico State University
8. Farm or Lease Name: NMSU Property
3. Address of Operator: P.O. Box 3545 - Las Cruces, NM 88003
9. Well No.: LRG-3648
4. Location of Well: Unit Letter D 330 Feet From The West Line and 1000 Feet From The North Line, Section 27 Township 23 S. Range 2 E. NMPM.
10. Field and Pool, or Wildcat
15. Elevation (Show whether DF, RT, GR, etc.): 4,000 feet above M.S.L.
12. County: Dona Ana

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 pertinenet dates, including estimated date of starting any proposed work)* SEE RULE 203.

The well was building up a well head pressure of 8 psig in August. NMSU acidized this well in September in order to alleviate this problem. (Detailed as follows) August 29 - 18 barrels (990 gal.) of 30% muriatic acid was placed in the well. August 30 - the well was surged repeatedly with air pressure. September 2 - the well was again surged repeatedly. September 3 - air jetting of the well was begun. September 6 - air jetting was terminated. Ph and Conductivity was monitored during the jetting process, which removed approximately 160,000 gallons of fluid from the well. September 9 - well placed back into service with 0 psig head pressure.

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

SIGNED [signature] TITLE Director, Physical Plant DATE 10/1/85

APPROVED BY Roy E Johnson TITLE DISTRICT SUPERVISOR DATE 10-8-85

CONDITIONS OF APPROVAL, IF ANY:

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501

Form G-104
Adopted 10/1/74

CERTIFICATE OF COMPLIANCE AND AUTHORIZATION TO PRODUCE GEOTHERMAL RESOURCES

DEC 27 1982
RECEIVED

OWNER OR OPERATOR
Name New Mexico State University
Address Box 3445 New Mexico State University

TYPE OF WELL
Geothermal Producer [ ] Low-Temperature Thermal [ ] Injection/Disposal [X]

REASON FOR FILING
New Well [X] Recompletion [ ]
Change in Ownership [ ] Designation of Purchaser [ ]
Other (Please Explain) [ ] _____

DESCRIPTION OF WELL
Lease Name N/A Well No. NMSU GD-2 LRG 3648 Name of Reservoir New Mexico State University
Kind of Lease (Fee, Fed. or State) N/A Lease Number N/A

LOCATION
Unit Letter D ; 330 feet from the West line and 1,000 feet from the North line of
Section 27 Township 23 S Range 2 E
County _____

TYPE OF PRODUCT
Dry Steam _____ Steam and Water _____ Low Temp. Thermal Water X

DESIGNATION OF PURCHASER OF PRODUCT
Name of Purchaser N/A
Address of Purchaser _____
Product Will Be Used For _____

CERTIFICATE OF COMPLIANCE

I hereby certify that all rules and regulations concerning geothermal resources wells in the State of New Mexico, as promulgated by the Oil Conservation Commission of New Mexico, have been complied with, with respect to the subject well, and that the information given above is true and complete to the best of my knowledge and belief.

Signed _____ Position Director, PPD Date 12-22-82

Approved _____ Position Div Director Date 12/30/82

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501

Form G-104
Adopted 10/1/74

CERTIFICATE OF COMPLIANCE AND AUTHORIZATION TO PRODUCE GEOTHERMAL RESOURCES

OWNER OR OPERATOR
Name New Mexico State University

DEC 27 1982
RECEIVED

Address Box 3445 New Mexico State University

TYPE OF WELL
Geothermal Producer [ ] Low-Temperature Thermal [ ] Injection/Disposal [X]

REASON FOR FILING
New Well [X] Recompletion [ ]
Change in Ownership [ ] Designation of Purchaser [ ]
Other (Please Explain) [ ] _____

DESCRIPTION OF WELL
Lease Name N/A Well No. NMSU GD-2 LRG 3648 Name of Reservoir New Mexico State University
Kind of Lease (Fee, Fed. or State) N/A Lease Number N/A

LOCATION
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1,000 feet from the North line of
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County _____

TYPE OF PRODUCT
Dry Steam _____ Steam and Water _____ Low Temp. Thermal Water X

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Name of Purchaser N/A
Address of Purchaser _____
Product Will Be Used For _____

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I hereby certify that all rules and regulations concerning geothermal resources wells in the State of New Mexico, as promulgated by the Oil Conservation Commission of New Mexico, have been complied with, with respect to the subject well, and that the information given above is true and complete to the best of my knowledge and belief.

Signed _____ Position Director, PPD Date 12-22-82

Approved _____ Position Dy. Director Date 12/30/82

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501

Form G-104
Adopted 10/1/74

CERTIFICATE OF COMPLIANCE AND AUTHORIZATION TO PRODUCE GEOTHERMAL RESOURCES

DEC 27 1982
RECEIVED

OWNER OR OPERATOR
Name New Mexico State University
Address Box 3445 New Mexico State University

TYPE OF WELL
Geothermal Producer [ ] Low-Temperature Thermal [ ] Injection/Disposal [X]

REASON FOR FILING
New Well [X] Recompletion [ ]
Change in Ownership [ ] Designation of Purchaser [ ]
Other (Please Explain) [ ] _____

DESCRIPTION OF WELL
Lease Name N/A Well No. NMSU GD-2 LRG 3648 Name of Reservoir New Mexico State University
Kind of Lease (Fee, Fed. or State) N/A Lease Number N/A

LOCATION
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Section 27 Township 23 S Range 2 E
County _____

TYPE OF PRODUCT
Dry Steam _____ Steam and Water _____ Low Temp. Thermal Water X

DESIGNATION OF PURCHASER OF PRODUCT
Name of Purchaser N/A
Address of Purchaser _____
Product Will Be Used For _____

CERTIFICATE OF COMPLIANCE

I hereby certify that all rules and regulations concerning geothermal resources wells in the State of New Mexico, as promulgated by the Oil Conservation Commission of New Mexico, have been complied with, with respect to the subject well, and that the information given above is true and complete to the best of my knowledge and belief.

Signed _____ Position Director, PPD Date 12-22-82

Approved _____ Position Div Director Date 12/30/82

NEW MEXICO OIL CONSERVATION COMMISSION

Form G-112
Adopted 10-1-74

P. O. Box 2088, Santa Fe 87501

APPLICATION TO PLACE WELL ON INJECTION-GEOTHERMAL RESOURCES

SEP 27 1982

Operator	Address
New Mexico State University	Box 3445 New Mexico State University

Lease Name	Well No.	Field	County
N/A	GD-2,LRG3648	NMSU	Dona Ana

Location

Unit Letter D ; Well is Located 330 Feet From The West Line And 1,000 Feet From The North Line, Section 27 Township 23 S Range 2 E NMPM

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
Conductor Pipe					
Surface Casing					
Long String	8 5/8"	370 feet	200	Ground surface	Positive return
Tubing: Screen	8 5/8"	390-470 370-380	Name, Model and Depth of Tubing Packer: Johnson wire round screen, type 316L SS, 0.60 slots		

Name of Proposed Injection Formation	Top of Formation	Bottom of Formation
Santa Fe	250	990 feet

Is Injection Through Tubing, Casing, or Annulus?	Perforations or Open Hole?	Proposed Interval(s) of Injection
Thru screen	screen	370-380 390-470

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

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

Depth of Bottom of Deepest Fresh Water Zone in This Area	Is This Injection for Purpose of Pressure Maintenance or Water Disposal? (See Rules 501 and 502)
None	water disposal

Anticipated Daily Injection Volume: Minimum	Maximum	Open or Closed Type System	Is Injection to be by Gravity or Pressure?	Approx. Pressure (psi)
370,000gpd 150,00gpd	370,000gpd	closed	gravity	

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

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

New Mexico State University

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

(New Mexico State University)

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

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

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

(Signature) Director, Physical Plant Department (Title) 12-22-82 (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 Commission will hold the application for a period of 20 days from the date of receipt by the Commission'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.

Form G-105
Adopted 10/1/74

NEW MEXICO OIL CONSERVATION COMMISSION

P. O. Box 2088, Santa Fe 87501

GEOTHERMAL RESOURCES WELL LOG

DEC 27 1982

Operator New Mexico State University

Address Box 3445 New Mexico State University

Reservoir NMSU

Lease Name N/A Well No. GD-2 LRG 3648 Unit Letter D

Location: 330 feet from the West line and

1,000 feet from the North line Section 27

Township 23 S Range 2 E County Dona Ana

FORMATIONS PENETRATED BY WELL

DEPTH TO		Thickness	Drilled or Cored	Recovery	DESCRIPTION
Top of Formation	Bottom of Formation				
G.S.	725	725 feet	Drilled	Cutting	Santa Fe fill
725	790	65 feet	Drilled	Cutting	Clay and finely divided sand (Santa Fe group)
790	990	200 feet	Drilled	Cutting	Santa Fe fill

Attach Additional Sheets if Necessary

This form must be accompanied by copies of electric logs, directional surveys, physical or chemical logs, water analyses, tests, and temperature surveys (See Rule 205).

CERTIFICATION

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief.

Signed [signature] Position Director, PPD Date 12-22-82

Form G-105
Adopted 10/1/74

NEW MEXICO OIL CONSERVATION COMMISSION

P. O. Box 2088, Santa Fe 87501

GEOTHERMAL RESOURCES WELL LOG

DEC 27 1982
RECEIVED

Operator New Mexico State University

Address Box 3445 New Mexico State University

Reservoir NMSU

Lease Name N/A Well No. GD-2 LRG 3648 Unit Letter D

Location: 330 feet from the West line and 1,000 feet from the North line Section 27

Township 23 S Range 2 E County Dona Ana

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CERTIFICATION

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief.

Signed _____ Position Director, PPD Date 12-22-82

Form G-106
Adopted 10/1/74

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501

DEC 27 1982

GEOTHERMAL RESOURCES WELL SUMMARY REPORT

Operator New Mexico State University — Address Box 3445 New Mexico State University
Lease Name NMSU — Well No. NMSU-GD-2 LRG 3648
Unit Letter D — Sec. 27 — Twp. 23 S — Rge 2 E
Reservoir NMSU — County Dona Ana

Commenced drilling 23 September 1982
Completed drilling 22 October 1982
Total depth 990 — Plugged depth 477-990
Junk N/A

GEOLOGICAL MARKERS	DEPTH
Clay zone	725-790
Rhyolite gravel	810-990

Commenced producing N/A (Date)
Geologic age at total depth: 1.0 million years

Date	Static test Shut-in well head		Production Test Data								
			Total Mass Flow Data					Separator Data			
	Temp. °F	Pres. Psig.	Lbs/Hr	Temp. °F	Pres. Psig.	Enthalpy	Orifice	Water cuft/Hr	Steam Lbs/Hr	Pres. Psig.	Temp. °F

CASING RECORD (Present Hole)

Size of Hole	Size of Casing	Weight of Csg/ft.	Grade of Casing	New or Used	Seamless or Lapweld	Depth of Shoe	Top of Casing	Number of Sacks Cement	Top of Cement	Cement Top Determined By
14 3/4"	8 5/8"		A120	New	Seamless	347'	1' above ground	200	ground surface	Cement returns

PERFORATED CASING

(Size, top, bottom, perforated intervals, size and spacing of perforation and method.)

8 5/8-inch Johnson stainless steel type 316L, wire round, 0.60 inch slots, 1½ by 3-inch collars, from 370 to 380 feet, and 390 to 470 feet.

Was analysis of effluent made? yes — Electrical log depths 990 feet — Temperature log depths 990 feet

CERTIFICATION

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief.

Signed [signature] Position Director, PPD Date 12-22-82

Form G-106
Adopted 10/1/74

NEW MEXICO OIL CONSERVATION COMMISSION

P. O. Box 2088, Santa Fe 87501

DEC 27 1982

GEOTHERMAL RESOURCES WELL SUMMARY REPORT

Operator New Mexico State University — Address Box 3445 New Mexico State University

Lease Name NMSU — Well No. NMSU-GD-2 LRG 3648

Unit Letter D — Sec. 27 — Twp. 23 S — Rge 2 E

Reservoir NMSU — County Dona Ana

Commenced drilling 23 September 1982

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CERTIFICATION

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief.

Signed [signature] Position Director, PPD Date 12-22-82

Form G-107
Adopted 10/1/74

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501

DEC 27 1982

GEOTHERMAL RESOURCES WELL HISTORY

Operator New Mexico State University Address Box 3445 New Mexico State University
Lease Name _____ Well No. NMSU GD-2 LRG 3648
Unit Letter D Sec. _____ Twp. 23S Rge 2E
Reservoir New Mexico State University County Dona Ana

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting, and initial production data and zone temperature. (Attach additional sheets if necessary.)

Date	
3 Sep 82	Spudded well; pilot hole drilled 7 7/8-inch diameter to 520 feet and 6 1/2-inch to 991 feet.
6 Oct 82	Pilot hole logged by Century Geophysical.
-7 Oct 82	Pilot hole packed with gravel, and water samples were jetted from 840 feet and 468 feet of depth. Jetting continued for 6 hours at each horizon to assure representative samples were attained. Water temp. 88°F.
1-15 Oct 82	Pilot hole reamed to 14 3/4-inch diameter to 486 feet.
1-22 Oct 82	Casing and screen set, with perforated zones 370 to 380 feet, and 390 to 470 feet. Blank casing 0-370, 380-390, and 470 to 477. Bottom cement plug set (20 sacks of cement) from 464 to 486 feet. Gravel set from 464 to 348 feet. Casing cemented with 200 sacks of cement through gravel tube. Good cement returns at surface from 347 feet to surface.
5-28 Oct 82	Well developed by air jetting. Flow cleared in 6 hours. Approximately 100 gpm air jetted for 6 hours each of four days.
-5 Nov 82	Well test pumped at 100-150 gpm for total of 24 hours.
5-24 Nov 82	Well re-developed by air jetting for a total of 48 hours.
9-30 Nov 82	Well head installed, and connection made to geothermal disposal pipeline.
-15 Dec 82	Fifteen day controlled test reinjection. Flow maintained at 220-240 gpm. Gravity reinjection.

CERTIFICATION

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief.

Signed _____ Position Director, P.P.D. Date 12-22-82

Form G-107
Adopted 10/1/74

NEW MEXICO OIL CONSERVATION COMMISSION

P. O. Box 2088, Santa Fe 87501

DEC 27 1982

GEOTHERMAL RESOURCES WELL HISTORY

Operator New Mexico State University Address Box 3445 New Mexico State University

Lease Name _____ Well No. NMSU GD-2 LRG 3648

Unit Letter D Sec. _____ Twp. 23S Rge 2E

Reservoir New Mexico State University County Dona Ana

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Date	
23 Sep 82	Spudded well; pilot hole drilled 7 7/8-inch diameter to 520 feet and 6 1/2-inch to 991 feet.
6 Oct 82	Pilot hole logged by Century Geophysical.
5-7 Oct 82	Pilot hole packed with gravel, and water samples were jetted from 840 feet and 468 feet of depth. Jetting continued for 6 hours at each horizon to assure representative samples were attained. Water temp. 88°F.
11-15 Oct 82	Pilot hole reamed to 14 3/4-inch diameter to 486 feet.
21-22 Oct 82	Casing and screen set, with perforated zones 370 to 380 feet, and 390 to 470 feet. Blank casing 0-370, 380-390, and 470 to 477. Bottom cement plug set (20 sacks of cement) from 464 to 486 feet. Gravel set from 464 to 348 feet. Casing cemented with 200 sacks of cement through gravel tube. Good cement returns at surface from 347 feet to surface.
25-28 Oct 82	Well developed by air jetting. Flow cleared in 6 hours. Approximately 100 gpm air jetted for 6 hours each of four days.
-5 Nov 82	Well test pumped at 100-150 gpm for total of 24 hours.
15-24 Nov 82	Well re-developed by air jetting for a total of 48 hours.
29-30 Nov 82	Well head installed, and connection made to geothermal disposal pipeline.
-15 Dec 82	Fifteen day controlled test reinjection. Flow maintained at 220-240 gpm. Gravity reinjection.

CERTIFICATION

I hereby certify that the information given above and the data and material attached hereto are true and complete to the best of my knowledge and belief.

Signed _____ Position Director, P.P.D. Date 12-22-82

To: Roy Cunniff, PSL

DEC 27 1982

From: Andrew Lee Bristol, Soil & Water Testing Lab

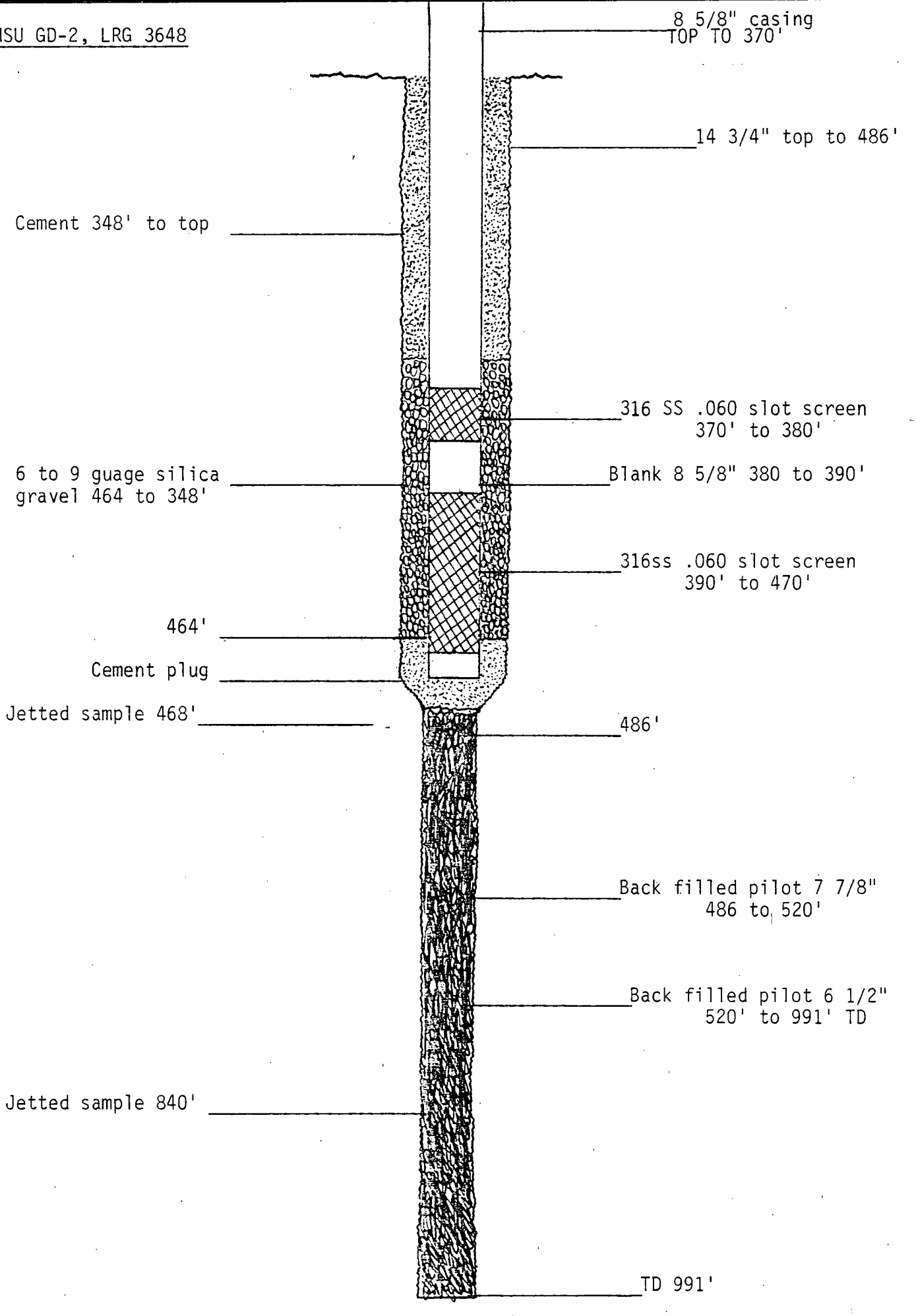
Subject: Water analysis of geothermal injection well (Lab Nos 4405-4406)

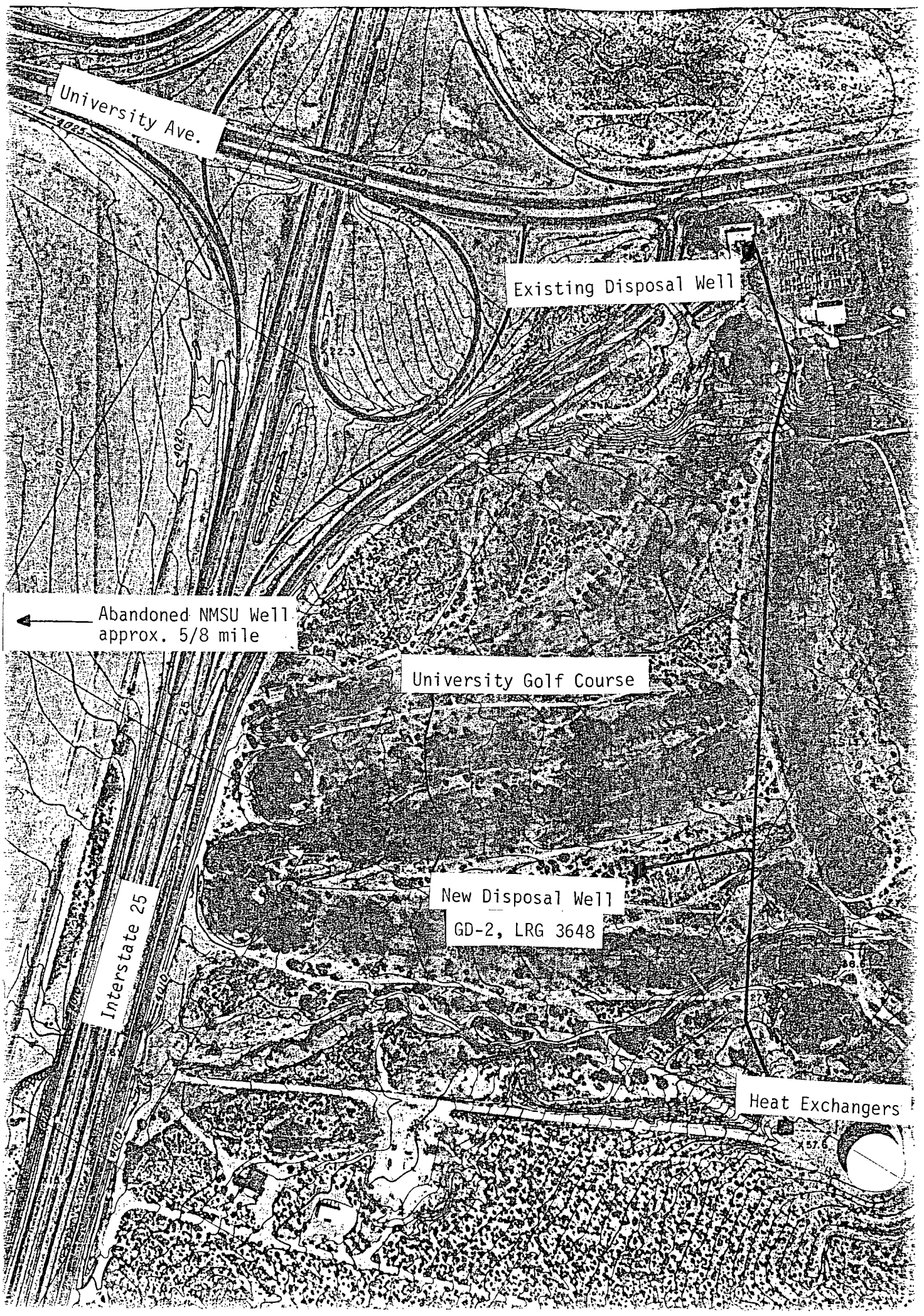
		mmhos/cm	mg/L							
	Sample	pH	E.C.	Na	K	Ca	Mg	Cl	CO_3	HCO_3	SO_4
NEW	370-450	7.90	2.70	427.6	43.8	130.0	36.0	573.7	0	422.2	315
OLD	840-850	7.91	2.45	386.2	34.8	114.5	36.6	440.3	0	494.2	280

	mg/L									
	As	Ba	Cd	Cr	Pb	Hg	Se	Ag	NO_3-N	F
370-450	<.001	.08	<.005	.002	<.005	<.0002	.001	<.05	<.01	1.29
840-850	.001	.09	<.005	.002	<.005	<.0002	.001	<.05	.02	.55

	mg/L					(---- as $CaCO_3$ ----)	
	SiO_2	Fe	Mn	B	TDS by Σ	Hardness	Alkalinity
370-450	23.2	1.28	.09	.30	1948	473	346
840-850	36.0	6.00	.13	.30	1787	436	405

NMSU GD-2, LRG 3648




University Ave.
Existing Disposal Well
Abandoned NMSU Well
approx. 5/8 mile
University Golf Course
Interstate 25
New Disposal Well
GD-2, LRG 3648
Heat Exchangers

CENTURY GEOPHYSICAL CORPORATION

* * * COMPO-LOG VOLT TEMPERATURE SURVEY * * *

CLIENT: PHYSICAL SCIENCE LAB
LOCATION: UNIV. GOLF COURSE
TRUCK NO.: 7602
DATA : VOL2

HOLE ID: REINJECTION WELL
DATE: 10-06-82
PROBE TYPE 9055A

TEMPERATURE (DEG. F.)

DEPTH FT	TEMP. DEG.F.	85	86	87	88	89	90
10.5	86.3	I	*				I
15.5	86.3	I	*				I
20.5	86.5	I	*				I
25.5	86.6	I	*				I
30.5	86.6	I	*				I
35.5	86.6	I	*				I
40.5	86.7	I	*				I
45.5	86.8	I	*				I
50.5	86.8	I	*				I
55.5	86.8	I	*				I
60.5	86.8	I	*				I
65.5	86.8	I	*				I
70.5	86.8	I	*				I
75.5	86.9	I	*				I
80.5	86.9	I	*				I
85.5	86.9	I	*				I
90.5	86.9	I	*				I
95.5	87.2	I	*				I
100.5	87.1	I	*				I
105.5	87.3	I	*				I
110.5	87.4	I	*				I
115.5	87.3	I	*				I
120.5	87.3	I	*				I
125.5	87.4	I	*				I
130.5	87.4	I	*				I
135.5	87.4	I	*				I
140.5	87.4	I	*				I
145.5	87.4	I	*				I
150.5	87.5	I	*				I
155.5	87.5	I	*				I
160.5	87.5	I	*				I
165.5	87.5	I	*				I
170.5	87.5	I	*				I
175.5	87.7	I	*				I
180.5	87.8	I	*				I
185.5	87.9	I	*				I
190.5	87.9	I	*				I
195.5	87.9	I	*				I
200.5	87.9	I	*				I
205.5	87.9	I	*				I
210.5	88.0	I	*				I
215.5	88.1	I	*				I
220.5	88.0	I	*				I
225.5	88.0	I	*				I

230.5	88.0	I	* I
235.5	88.0	I	* I
240.5	88.1	I	* I
245.5	88.1	I	* I
250.5	88.1	I	* I
255.5	88.2	I	* I
260.5	88.2	I	* I
265.5	88.2	I	* I
270.5	88.4	I	* I
275.5	88.4	I	* I
280.5	88.5	I	* I
285.5	88.4	I	* I
290.5	88.4	I	* I
295.5	88.5	I	* I
300.5	88.6	I	* I
305.5	88.5	I	* I
310.5	88.5	I	* I
315.5	88.5	I	* I
320.5	88.7	I	* I
325.5	88.7	I	* I
330.5	88.6	I	* I
335.5	88.6	I	* I
340.5	88.8	I	* I
345.5	88.7	I	* I
350.5	88.7	I	* I
355.5	88.8	I	* I
360.5	88.8	I	* I
365.5	88.8	I	* I
370.5	88.8	I	* I
375.5	88.8	I	* I
380.5	88.8	I	* I
385.5	88.8	I	* I
390.5	88.8	I	* I
395.5	88.8	I	* I
400.5	88.8	I	* I
405.5	88.9	I	* I
410.5	88.8	I	* I
415.5	88.8	I	* I
420.5	88.8	I	* I
425.5	88.9	I	* I
430.5	88.9	I	* I
435.5	89.1	I	* I
440.5	88.9	I	* I
445.5	88.9	I	* I
450.5	88.9	I	* I
455.5	88.9	I	* I
460.5	89.1	I	* I
465.5	88.9	I	* I
470.5	88.9	I	* I
475.5	88.9	I	* I
480.5	88.9	I	* I
485.5	88.9	I	* I
490.5	89.1	I	* I
495.5	89.1	I	* I
500.5	89.1	I	* I
505.5	89.2	I	* I
510.5	89.3	I	* I
515.5	89.2	I	* I
520.5	89.2	I	* I
525.5	89.2	I	* I
530.5	89.2	I	* I
535.5	89.2	I	* I
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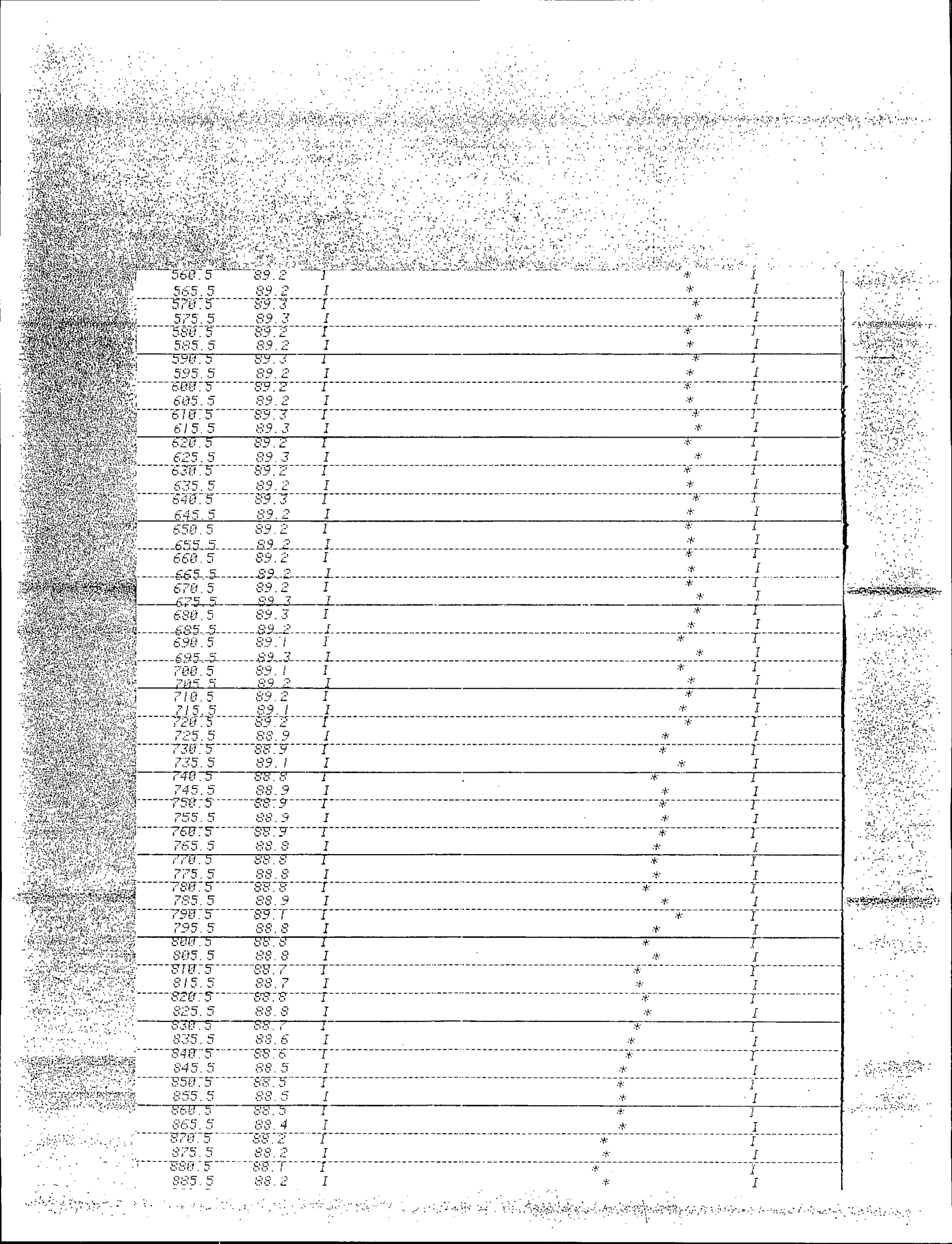
555.5	89.2	I	* I



890.5	88.0	I					*				I
895.5	88.0	I					*				I
900.5	88.0	I					*				I
905.5	88.0	I					*				I
910.5	88.0	I					*				I
915.5	88.0	I					*				I
920.5	88.0	I					*				I
925.5	87.9	I					*				I
930.5	87.8	I					*				I
935.5	87.9	I					*				I
940.5	87.9	I					*				I
945.5	87.8	I					*				I
950.5	87.8	I					*				I
955.5	87.7	I					*				I
960.5	87.7	I					*				I
965.5	87.7	I					*				I
970.5	87.7	I					*				I
975.5	87.5	I					*				I
980.5	87.4	I					*				I
985.5	87.4	I					*				I
990.5	87.4	I					*				I
DEPTH	TEMP.	X	---------X	---------X	---------X	---------X	---------X	---------X			
FT	DEG.F.	85		86		87		88		89	90

CENTURY GEOPHYSICAL CORPORATION

Tulsa, Oklahoma

BOREHOLE	DATE
REINJECTION WELL	10-6-82
UNIT/OPERATOR	FIELD OFFICE
7602/GRIMES	GRANTS

COMPANY: PHYSICAL SCIENCE LABORATORY

BOREHOLE: REINJECTION WELL

AREA: UNIV. GOLF COURSE

ELEVATION:

COUNTY: DONA ANA

STATE: N. M.

SECTION:

TOWNSHIP:

RANGE:

HOLE DATA

TOTAL DEPTH — DRILLER	1000'	BIT SIZE	7 3/8 - 6 3/4 - 6 1/2
TOTAL DEPTH — LOGGER	991'	CASING — TYPE & SIZE	NONE
TOTAL FOOTAGE LOGGED	991'	CASING DEPTH	—
LOGGING SPEED	30'/MIN	BOREHOLE FLUID	H_2O
REFERENCE LEVEL	GL	FLUID RESISTIVITY	— @ °F
PROBE NO.	9030A1-427	SOFTWARE LEVEL	8.2*A
		SCALE SELECTION	☐ OPERATOR ☐ CLIENT

REMARKS:

NG = 200 API

CAL = 2"/IN (-6)

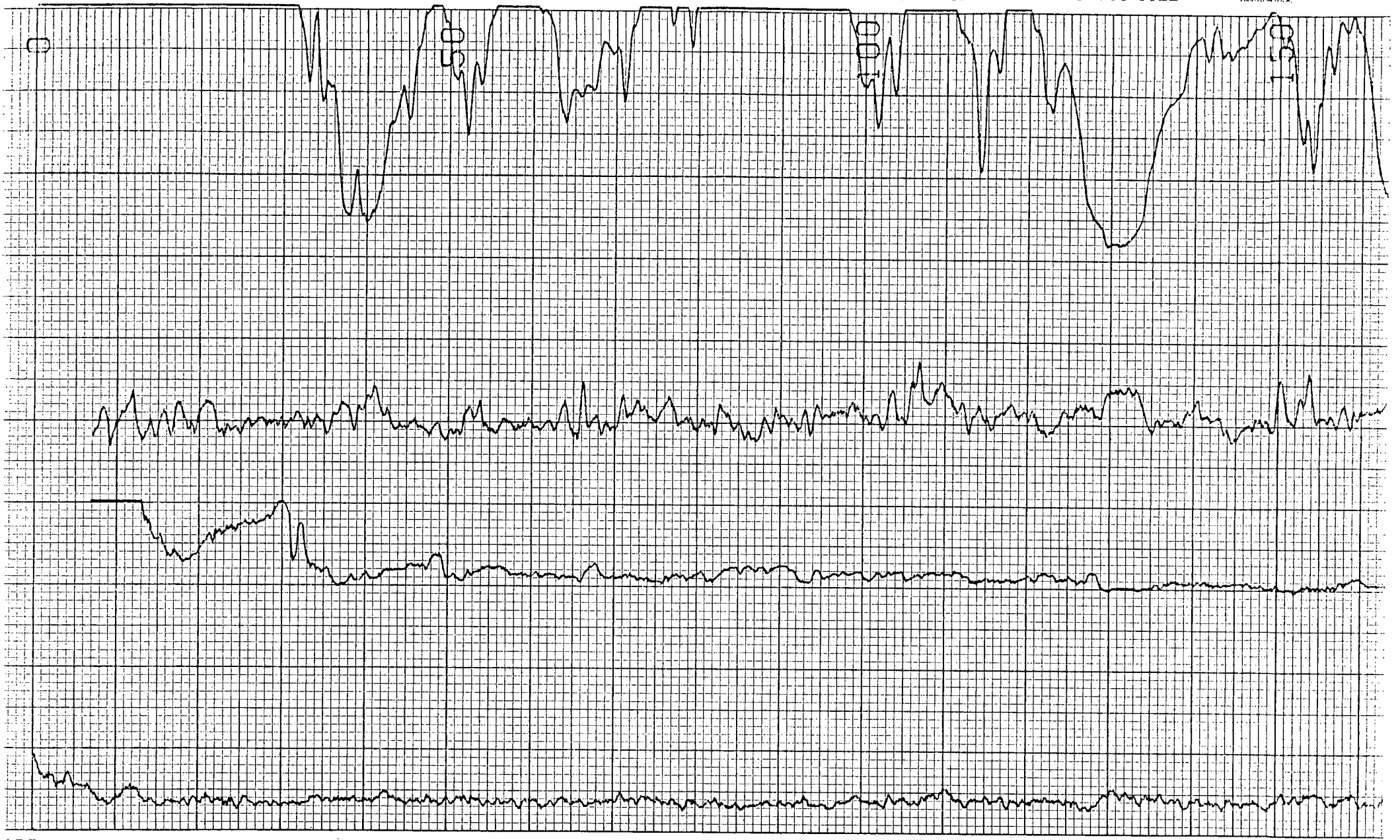
G-G = .5(-1)

R = 5(0)

EQUIPMENT DATA

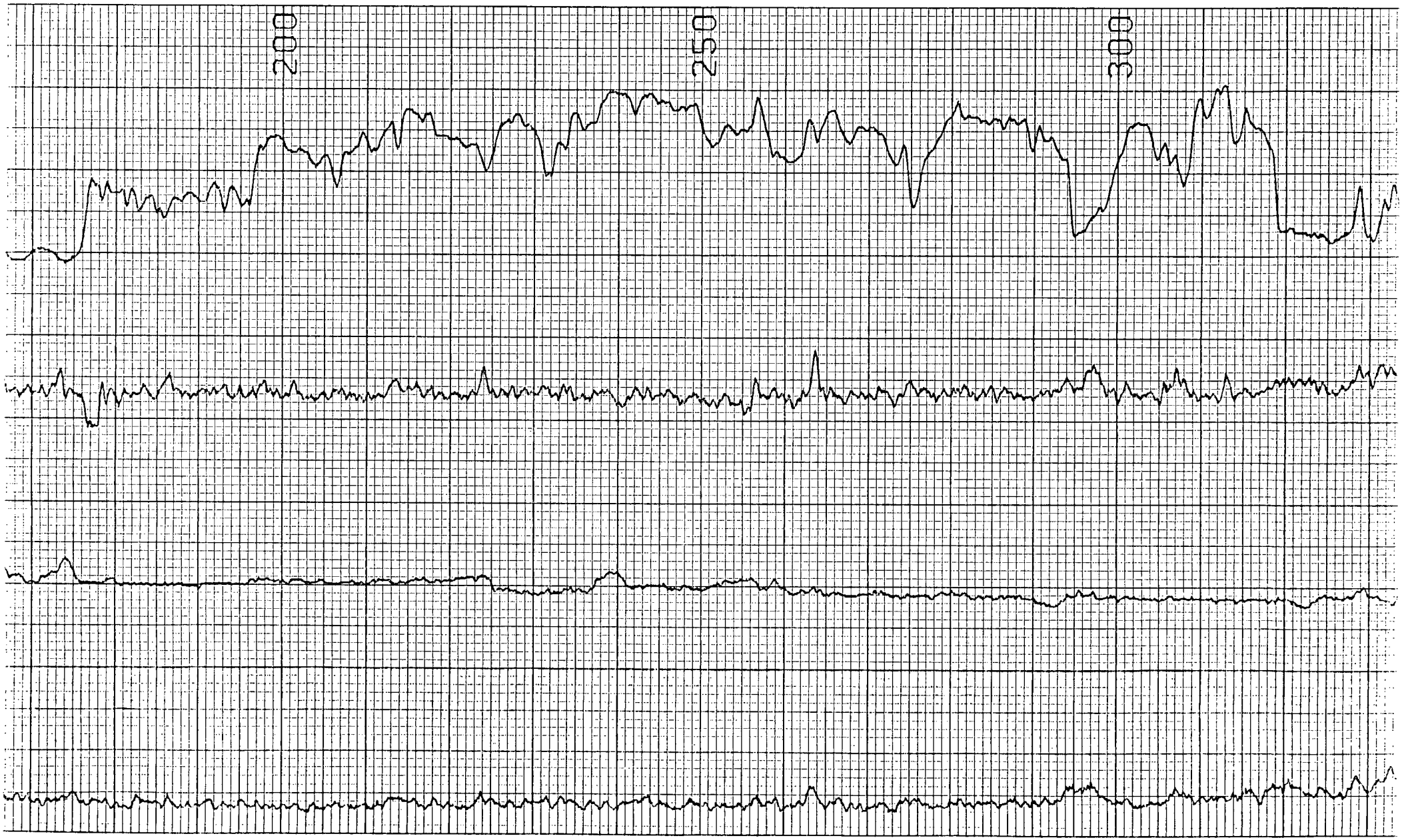
		9010	9030	9050/55	9060
PROBE MODEL		9010	9030	9050/55	9060
PROBE DIAMETER		1.87"	2.0"	1.87"	1.4"
NATURAL GAMMA	DETECTOR TYPE	NaI	NaI	NaI	NaI
	DETECTOR SIZE	.875" x 1.25"	1.125" x 4.5"	.875" x 4.0"	.5" x 3.0"
	STD. K-FACTOR	1.59×10^{-5}	—	$.558 \times 10^{-5}$	1.62×10^{-5}
	STD. DEADTIME	1 μsec	—	1.18 μsec	1 μsec
	CALIB. MODEL LOC.		—		
	CALIB DATE		—		
	K-FACTOR $\times 10^{-5}$		—		
	DEADTIME μsec		—		
	TEST READING		—		
	WATER FACTOR		—		
	CASING FACTOR		—		
DENSITY	DETECTOR TYPE	—	NaI	—	NaI
	DETECTOR SIZE	—	.5" x 1.5"	—	.5" x 3.0"
	SOURCE TYPE	—	Cs^{137}	—	Cs^{137}
	SOURCE NO.	—	280	—	
	SOURCE STRENGTH	—	125mCi	—	
	SOURCE SPACING	—		—	
NEUTRON	DETECTOR TYPE	—	—	He^3	—
	DETECTOR SIZE	—	—	1.0" x 6.0"	—
	SOURCE TYPE	—	—	AmBe	—
	SOURCE NO.	—	—		—
	SOURCE STRENGTH	—	—		—
	SOURCE SPACING	—	—		—
SNGL. PT RESISTANCE		1.4"D x 2.5"L	—	1.4"D x 2.5"L	1.1"D x 2.5"L
RESISTIVITY		—	6" FOCUSED	—	—
SELF POTENTIAL		YES	—	YES	YES
TEMPERATURE		—	—	YES	—
DEVIATION		—	—	NO / YES	—
CALIPER		—	YES	—	—

CENTURY GEOPHYSICAL CORP. PART NO. 780-0022 PRINTED IN U.S.A.



CENTURY GEOPHYSICAL CORP. PART NO. 786-0022 PRINTED IN U.S.A. 011

CENTURY GEOPHYSICAL CORP. PART NO. 786-0022 PRINTED IN U.S.A.



CENTURY GEOPHYSICAL CORP. PART NO. 786-0022 PRINTED IN U.S.A. 011

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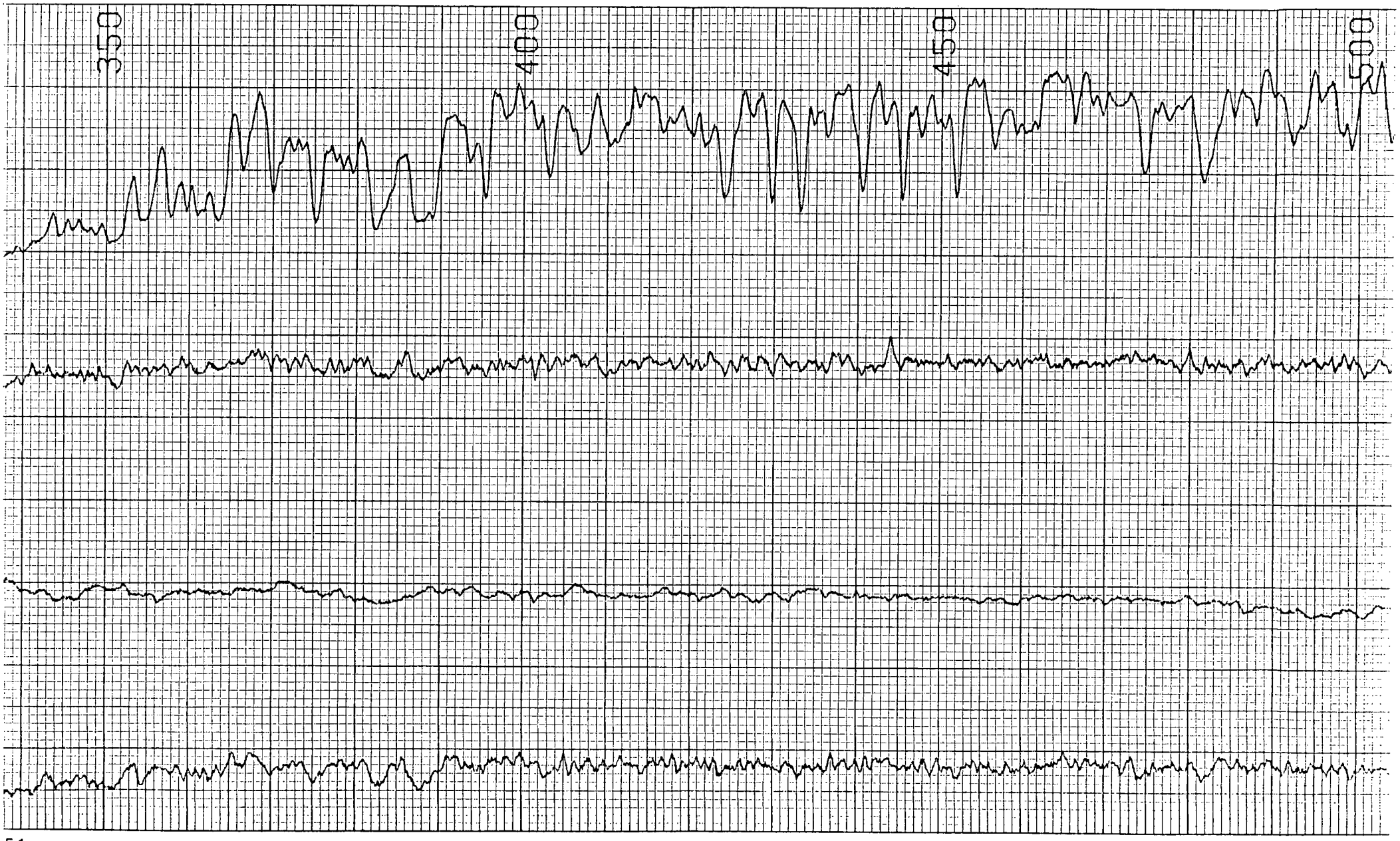
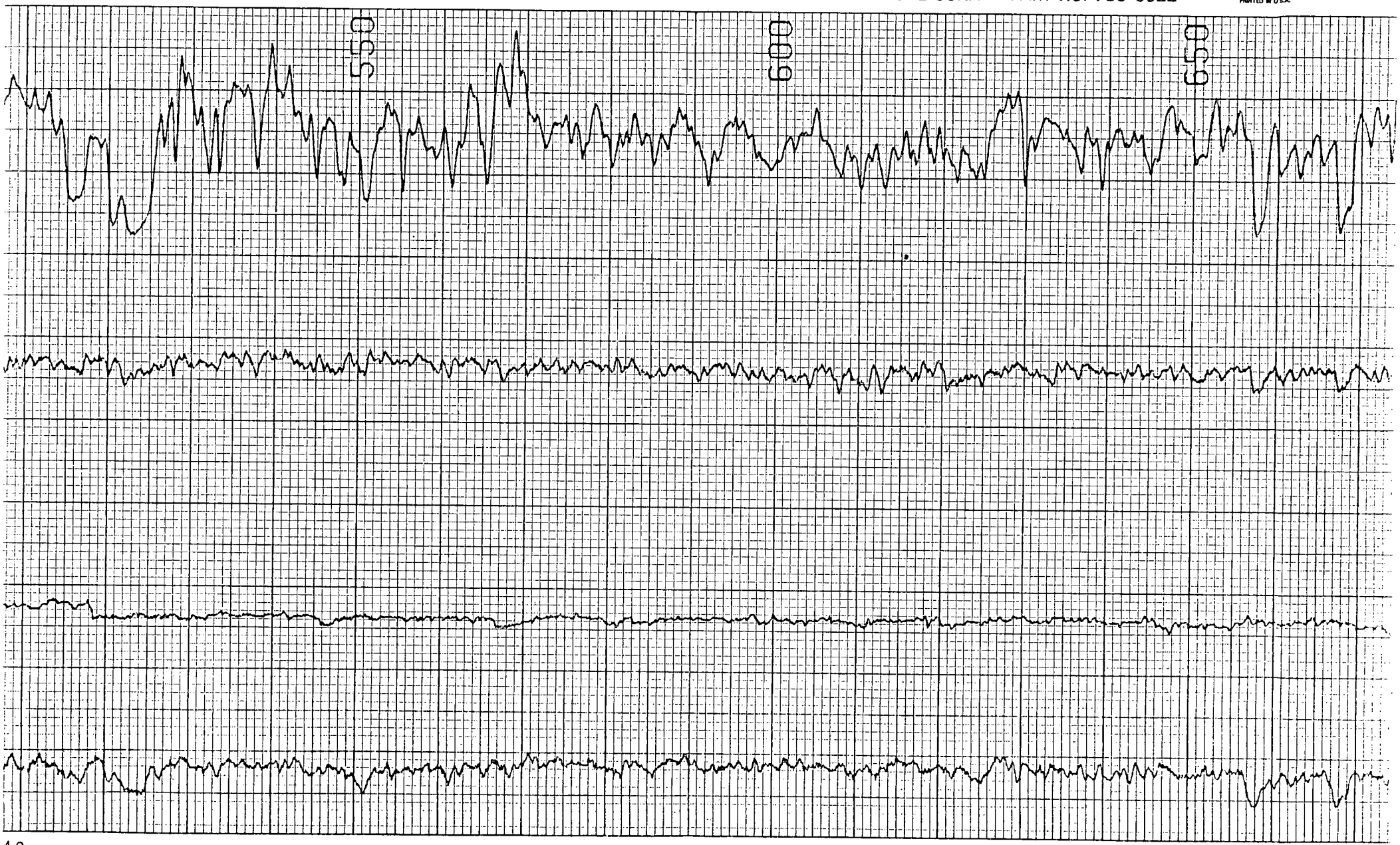


CENTURY GEOPHYSICAL CORP. PART NO. 786-0022 PRINTED IN U.S.A. 011 CENTURY GEOPHYSICAL CORP. PART NO. 786-0022 PRINTED IN U.S.A.



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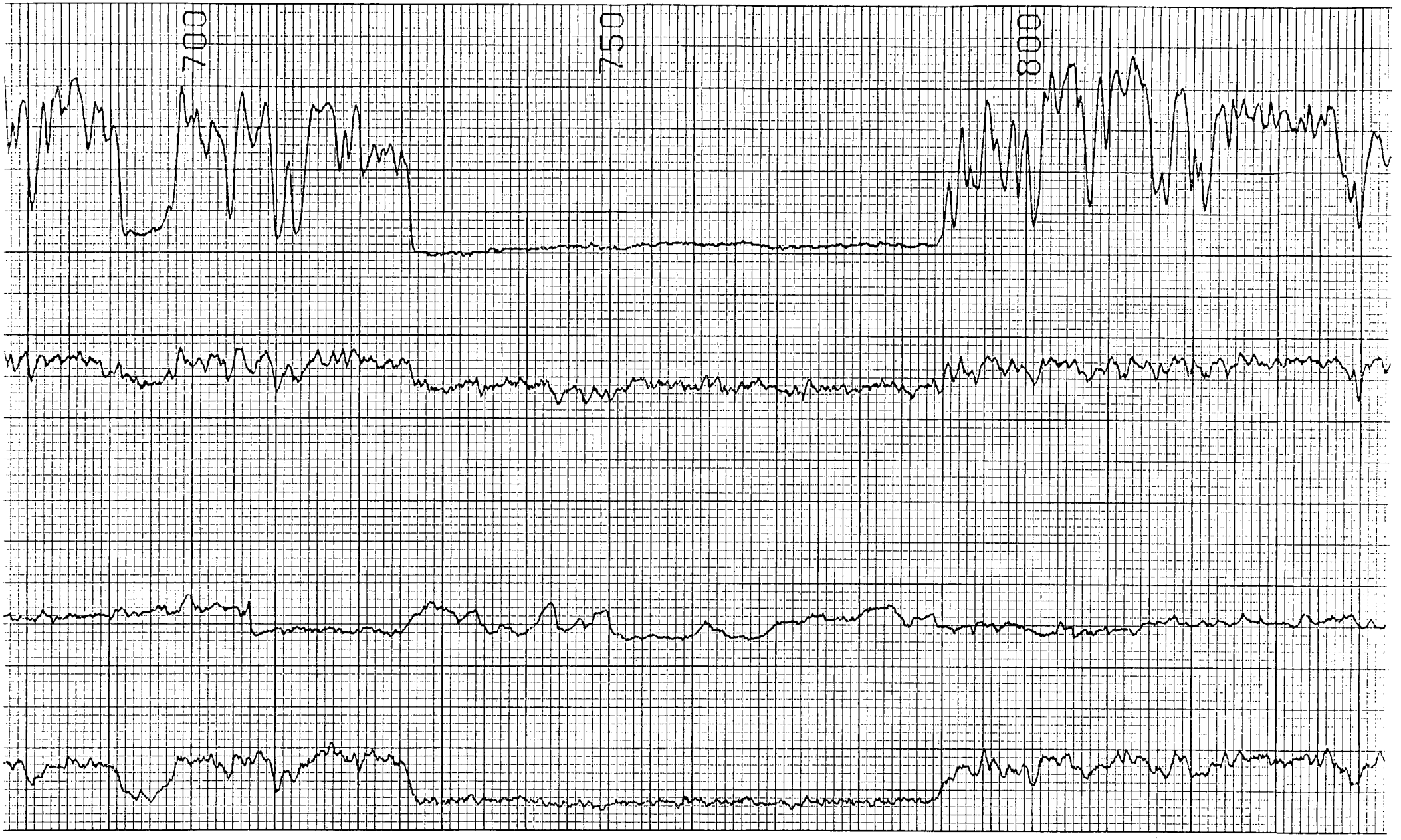

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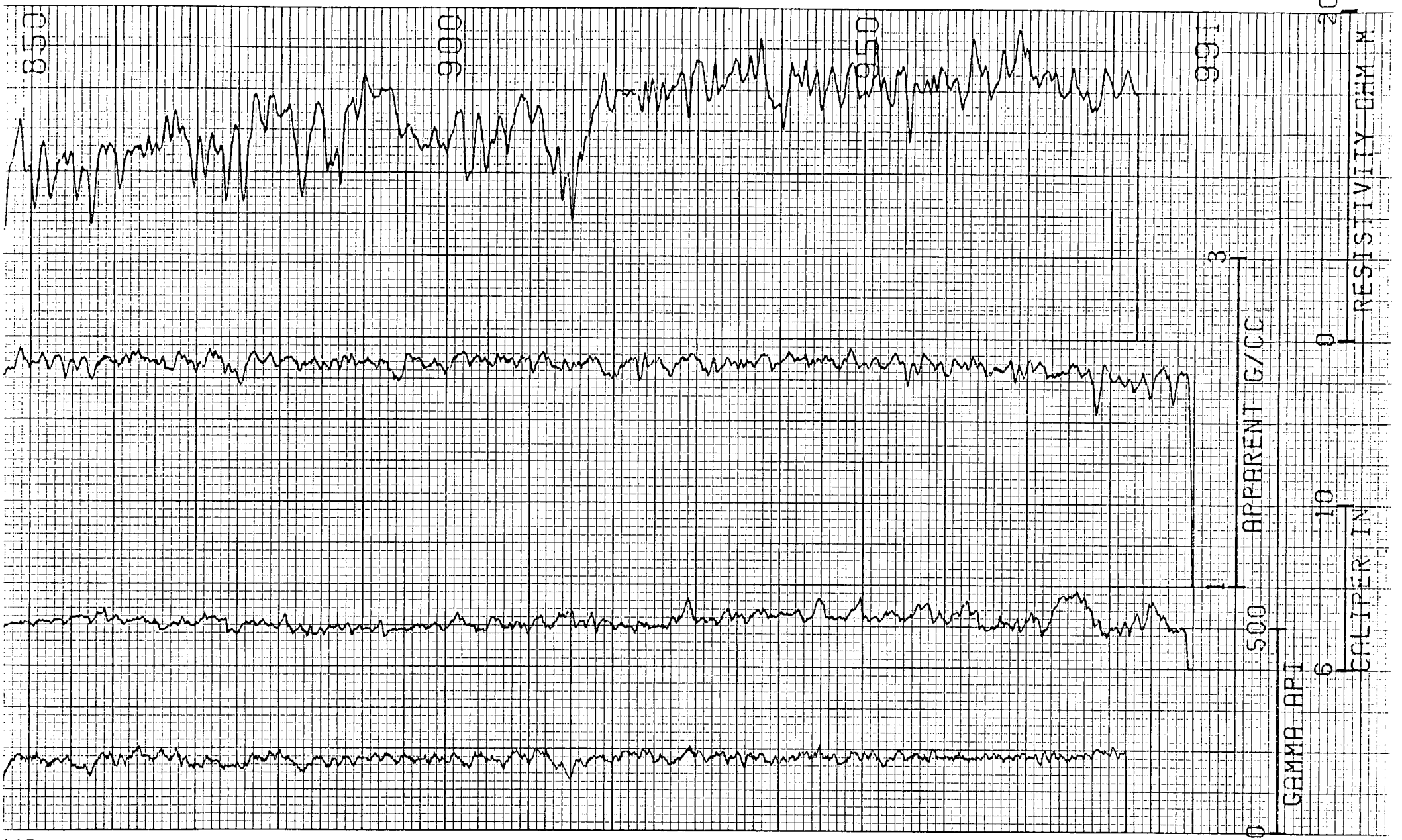

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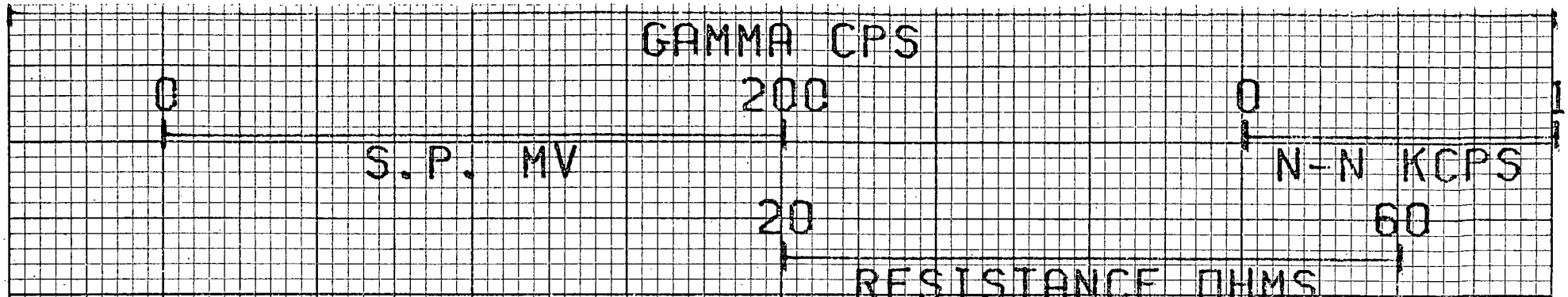


COMPU-LOG V8L2 PLOT 10-06-82

REINJECTION WELL

PHYSICAL SCIENCE LAB

UNIV. GOLF COURSE

HOLE DIAMETER : 07.8

PROBE # 9055A - 238

SENSOR #4 CAL STD CPS = 152

SENSOR #4 CAL RUN CPS = 141

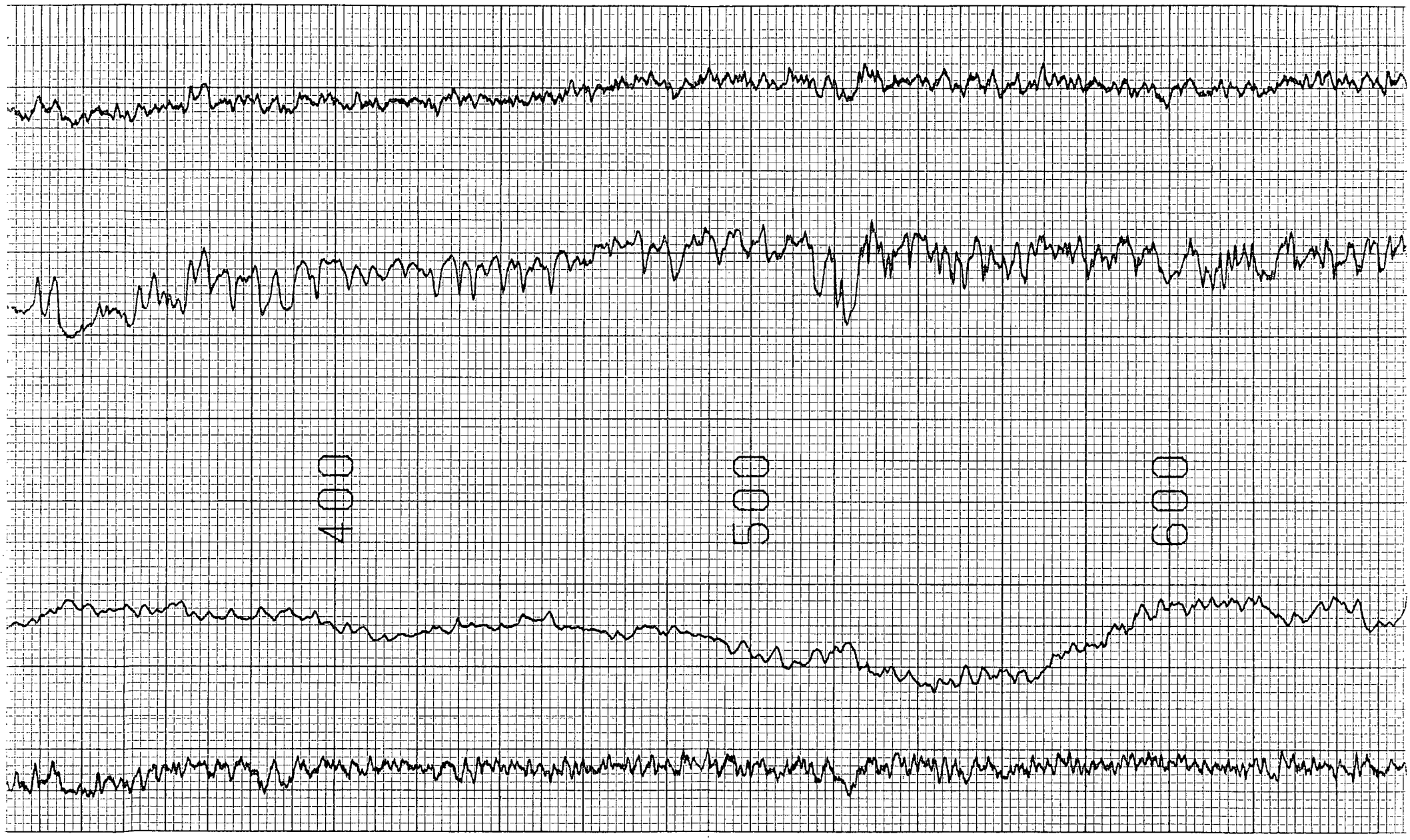
SENSOR #4 CAL BIAS = 0

DATA V8L2*A TRUCK # 7602

GRIMES APPL. #5 M

CENTURY GEOPHYSICAL CORP. PART NO. 786-0022 PRINTED IN U.S.A.

CENTURY GEOPHYSICAL CORP. PART NO. 786-0022 PRINTED IN U.S.A.



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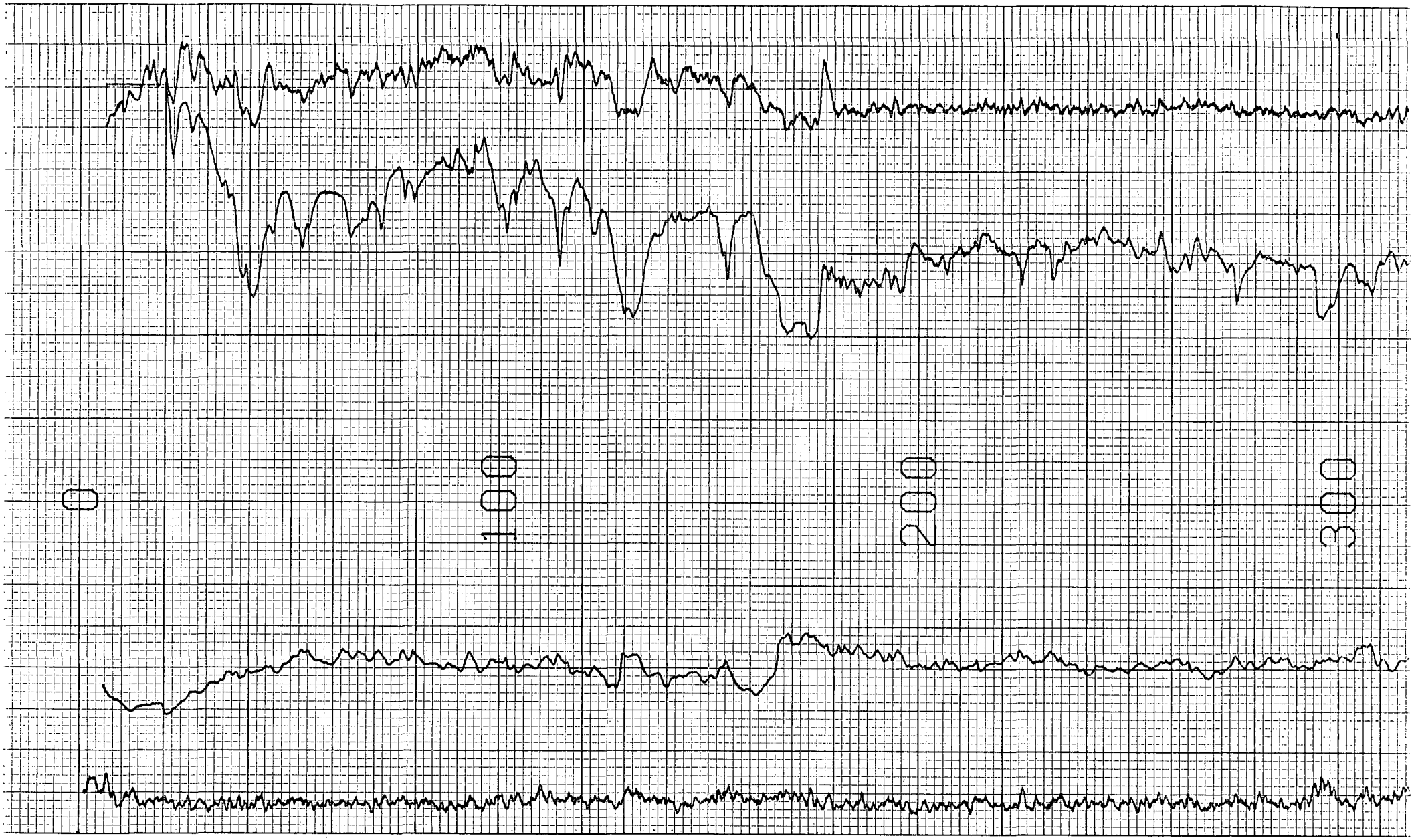

PHYSICAL PLANT DEPARTMENT

Box 3545/Las Cruces, New Mexico 88003
Telephone (505) 646-3021

NEW MEXICO STATE UNIVERSITY

October 28, 1982

Mr. Carl Ulvog
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87501

Dear Mr. Ulvog:

This letter forwards an original and two copies of a Form G-103, Well Completion Report, for our new geothermal disposal well.

Please be advised that this well has been re-designated as follows:

Old Name:	NMSU GD-2
New Name and Number:	NMSU GD-2, LRG 3648

This change makes the well numbering scheme conform to both the OCD and State Engineer well numbering system. Please annotate your file copies of the G-101 and G-102 for this well with the new number.

As you were advised during your informal inspection visit of October 26, we will conduct a 24-hour flow test next week. After that test, we will adivse you of our intent to place this well injection status by filing Form G-104 through G-107 and Form G-112.

Sincerely,

C. D. Black, Director
Physical Plant Department

Enclosure: a/s

Form G-103
Adopted 10/1/74

NO. OF COPIES RECEIVED		
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File	/	✓
N. M. B. M.		
U. S. G. S		
Operator	/	
Land Office		

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501

RECEIVED
NOV 03 1982
OIL CONSERVATION DIVISION
SANTA FE

SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

5. Indicate Type of Lease: State ☐ Fee ☒

5.a State Lease No.: N/A

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: N/A

2. Name of Operator: New Mexico State University

8. Farm or Lease Name: NMSU Property

3. Address of Operator: Box 3445 New Mexico State University

9. Well No.: GD-2 LRG 3648

4. Location of Well
Unit Letter D, 330 Feet From The West Line and 1,000 Feet From The North Line, Section 27 Township 23S Range 2E NMPM.

10. Field and Pool, or Wildcat: NMSU

15. Elevation (*Show whether DF, RT, GR, etc.*): 4,000 Feet above MSL

12. County: Dona Ana

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 Well Completion ☐	

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.

Pilot hole was spudded on 23 September 1982, and was drilled to 990 feet TD; 7 7/8-inch hole to 520 feet, and 6 1/2-inch to TD. Suite of electrical logs aquired, and water samples jetted from 840 and 968 feet. Hole was enlarged to 14 3/4-inch to 486 feet TD. Casing and screen setting:

surface to 370 feet; 380 to 390 feet; 470 to 477 blank casing, 8 5/8-inch diameter, 0.322 inches wall thickness, A120 Kaiser prime steel

screen setting; 370 to 380 feet and 390 to 470 feet of depth, 8 5/8-inch diameter Johnson Type 316L stainless steel, 0.60 slot, 1 1/2 by 3-inch collars

Bottom hole cement plug 486 feet to 467 feet, using 20 sacks of cement. Gravel from 486 to 347 feet, Colorado Silica gravel 0.079 to 0.132 inches. Cement from 347 feet to surface, 200 sacks. Good cement returns.

Well Development 25-29 October, 1982

Test pumping is now scheduled for 1-5 November 1982

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

SIGNED C. D. Black TITLE Director, Physical Plant Dept. DATE Oct. 28, 1982

APPROVED BY Carl Ulvog TITLE DISTRICT SUPERVISOR DATE 11/4/82

CONDITIONS OF APPROVAL, IF ANY:

Form G-103
Adopted 10/1/74

NO. OF COPIES RECEIVED		
DISTRIBUTION		
File		
N. M. B. M.		
U. S. G. S		
Operator		
Land Office		

NEW MEXICO OIL CONSERVATION COMMISSION
P. O. Box 2088, Santa Fe 87501

SUNDRY NOTICES AND REPORTS ON GEOTHERMAL RESOURCES WELLS

NOV 02 1982
OIL CONSERVATION DIVISION
SANTA FE

5. Indicate Type of Lease: State ☐ Fee ☒
5-a. State Lease No. N/A

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: N/A
2. Name of Operator: New Mexico State University
8. Farm or Lease Name: NMSU Property
3. Address of Operator: Box 3445 New Mexico State University
9. Well No.: GD-2 LRG 3648
4. Location of Well: Unit Letter D, 330 Feet From The West Line and 1,000 Feet From The North Line, Section 27 Township 23S Range 2E NMPM.
10. Field and Pool, or Wildcat: NMSU
15. Elevation (*Show whether DF, RT, GR, etc.*): 4,000 Feet above MSL
12. County: Dona Ana

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

NOTICE OF INTENTION TO:
- PERFORM REMEDIAL WORK ☐
- PLUG AND ABANDON ☐
- TEMPORARILY ABANDON ☐
- PULL OR ALTER CASING ☐
- CHANGE PLANS ☐
- OTHER ☐

SUBSEQUENT REPORT OF:
- REMEDIAL WORK ☐
- ALTERING CASING ☐
- COMMENCE DRILLING OPNS. ☐
- PLUG & ABANDONMENT ☐
- CASING TEST AND CEMENT JOB ☐
- OTHER Well Completion ☐

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Well Development 25-29 October, 1982

Test pumping is now scheduled for 1-5 November 1982

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

SIGNED C. D. Black TITLE Director, Physical Plant Dept. DATE Oct. 28, 1982

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

October 15, 1982

Physical Plant Department
Post Office Box 3545
Las Cruces, New Mexico 88003

Attention: C. D. Black

Re: Disposal of Geothermal Waters

Dear Sir:

Pursuant to your letter of October 8, 1982, requesting permission to dispose of geothermal water produced during well development and test pumping of well NMSU GD-2, your request is hereby granted.

The Oil Conservation Division requests that NMSU submit all water analyses done on the domestic and geothermal wells described in your letter.

If you have any questions on this matter you may contact Carl Ulvog or Oscar Simpson at (505) 827-2534.

Yours very truly,

JOE D. RAMEY
Director

JDR/OAS/fd

PHYSICAL PLANT DEPARTMENT

Box 3545/Las Cruces, New Mexico 88003
Telephone (505) 646-3021

NEW MEXICO STATE UNIVERSITY

October 8, 1982

Re: Request for approval of temporary surface disposal of geothermal waters

Mr. Joe D. Ramey, Director
Oil Conservation Division
Post Office Box 2088
Santa Fe, New Mexico 87501

Dear Mr. Ramey:

This letter contains a request for temporary surface disposal of geothermal water produced during well development actions on our new geothermal disposal well, NMSU GD-2. Based on driller's progress, we anticipate the well will be completed and ready for development by October 18, 1982.

Concerning water quality, the 7-7/8-inch pilot hole was drilled to a depth of 1,000 feet. Water samples were acquired by air-jetting from gravel-packed zones at 850 feet and 458 feet of depth. These zones were evaluated in order to compare them with normal ground water in the area of the new well, which contains approximately 1,550 ppm total dissolved solids. (See Enclosure 1) A complete chemical analysis is being conducted on the jetted samples, and preliminary values are as follows:

Strata	Conductivity MMHOS/cm	pH	Apparent TDS(mg/l)
850 feet	2,682	7.8	1,800
458 feet	3,123	7.6	1,900

NOTE: See Enclosure 2 for analysis.

It is apparent that the ground water quality is consistent with the geothermal water produced by our three geothermal wells, which range

in TDS from 1950 - 2020 mg/1. It is also apparent that normal ground water in this vicinity is similar to the slightly deeper formation water we sampled by air jetting.

As part of the well development actions, the following tasks are planned:

- Water jetting to clean the screen section between 374 and 484 feet of depth. Water source will be domestic water, and this will be delivered to a Johnson screen 4-point jet nozzle, at approximately 200 psig and 100 gpm.

- Air jetting, using a 2-inch tube and 1-inch air supply line, to produce an estimated 100 gpm.

- After the first two actions are completed, which will take about 8 hours, a contractor-operated submersible pump will be installed, and a 24-hour flow test will be conducted. Planned flow is 250-300 gpm.

Total amount of formation water at 1950 mg/1 TDS expected to be produced is approximately 400,000 gallons. We propose to install a temporary pipeline from the well head to an arroyo 250 feet away, and discharge the water into the arroyo bed. A small earthern dam will be erected across the arroyo to prevent downstream migration of formation waters. The map and tabular data at Enclosures 3 and 4 define the well within a two mile radius. As can be seen, the nearest well is an NMSU domestic water well, Number 9, which is more than 6,400 feet from the test well.

The above concept has been reviewed informerly by telephone between Oscar Simpson and Roy Cunniff of PSL.

Sincerely,

C. D. Black, Director

CDB/mm

Enclosures

cc: Roy Cunniff

1/3/62 Dickinson Lab. Inc.

1550 ppm. TDS
Si – 12 ppm.
pH – 7.0

Ca	– 9.23	meq/l.	ppm 185
Mg	– 1.30		16
Na	– 12.17		280
K	– .31		12
CO_3	.00		
HCO_3	6.88		420
SO_4	3.93		185
Cl	12.20		432

Tot. Hardness 11.80 grains/gal.
% Na 52.90

TEST WELL, NMSU GOLF COURSE
ANALYSIS OF SHALLOW GROUND WATER

NEW Golf Course Well (chemical Analysis)

	458'	850'
Equivalent conductivity; μmhos/cm	3123	9682
pH	7.60	7.80
Ions concentration; mg/l		
Na^+	432.5	375.0
K^+	44.5	47.5
Ca^{++}	131.1	113.9
Mg^{++}	36.11	35.56
$CO_3^=$	0	0
HCO_3^-	393.9	590.2
$SO_4^=$	254.0	160.0
Cl^-	516.0	433.7
$SiO_2^=$	63.7	43.0
TDS	1871.81	1798.86

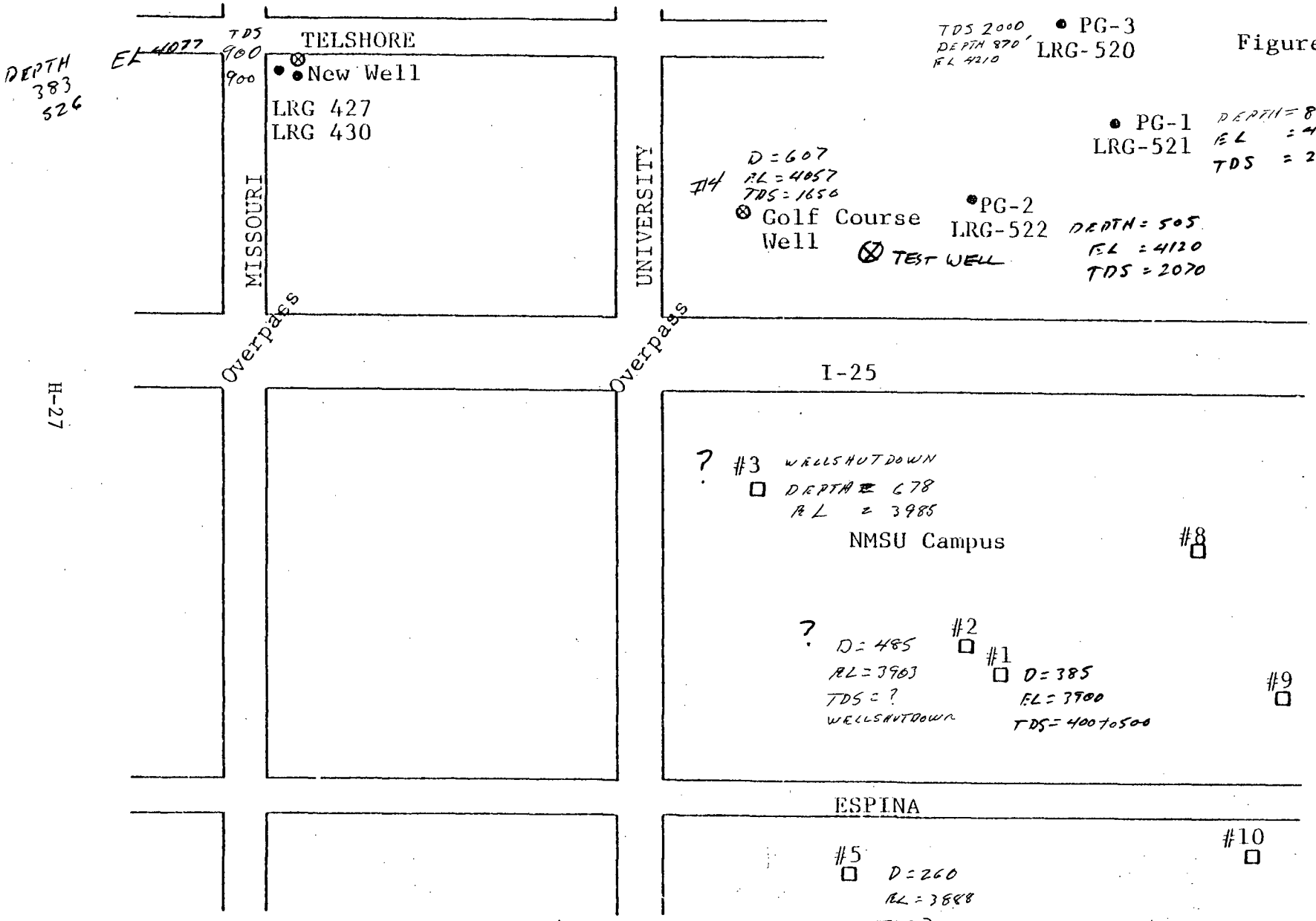
Note; There are some other elements such as: Pb, Mn, Ba, Cd, Cr, Hg, Se, As, Fe, F, B, Co, and Zn that are not accounted for. However, the above TDS is approximately ~~approximated to account for~~ 98% of the total TDS.

Table X-7
Well Data, Las Cruces Wells and Campus Wells

Well No.	Depth	Elev.	TDS	Distance to Golf Course Well (feet)	Remarks
LRG-427	383'	4077'	900	4300	Las Cruces City Well
LRG-430	526'	4077'	900	4000	Las Cruces City Well, to be abandoned Current well condition open only to 250
LRG-520	870'	4210'	2000	3700	NMSU PG-3, Geothermal production well
LRG-521	860'	4164'	2000	3535	NMSU PG-1, Geothermal production well
LRG-522	505'	4120'	2070	2500	NMSU Geothermal well for PG-2, President's Home
NMSU #1	385'	3900'	400-500	6150	Secondary producer of campus domestic water
NMSU #2	485'	3903'		6000	This well is used only for an observation well
NMSU #3	678'	3985'		3800	This well is not used and is questionable whether it is open at bottom
NMSU #4	607'	4057'	1650	0	Golf Course Well
NMSU #5	260'	3888'		6200	Used as an irrigation well, water is contaminated
NMSU #8	630'	3954'	800-900	5300	Not in service at present
NMSU #9	525'	3932'	500-550	6400	Principal producer for campus domestic water
NMSU #10	750'	3912	400-500	7300	Principal producer for campus domestic water

LOCATION OF DOMESTIC WATER WELLS AND GEOTHERMAL WELLS ON AND NEAR NMSU CAMPUS

Figure X-6



PHYSICAL PLANT DEPARTMENT

Box 3545/Las Cruces, New Mexico 88003
Telephone (505) 646-3021

NEW MEXICO STATE UNIVERSITY

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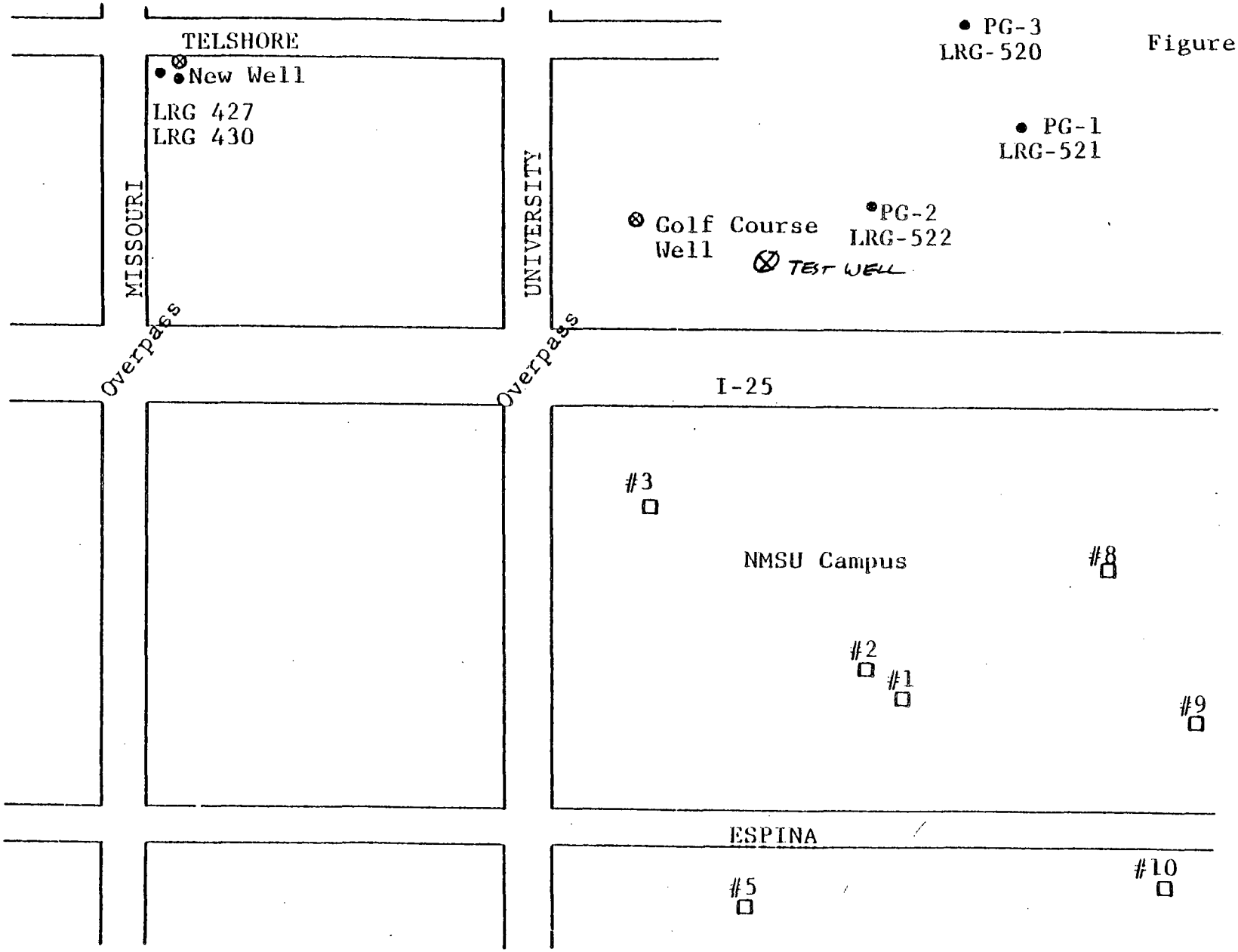

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