

NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

RECEIVED
SEP 1 1995

OIL CON. DIV.
DIST. 3

Frontier A #1
I-8-26N-12W

AMENDED ADMINISTRATIVE ORDER SWD-583

APPLICATION OF J.K. EDWARDS ASSOCIATES, INC. FOR SALT WATER DISPOSAL, SAN JUAN COUNTY, NEW MEXICO.

ADMINISTRATIVE ORDER OF THE OIL CONSERVATION DIVISION

Under the provisions of Rule 701(B), J.K. Edwards Associates, Inc. made application to the New Mexico Oil Conservation Division on August 7, 1995, for permission to complete for salt water disposal its Frontier Well No. 1-A located 1750 feet from the South line and 790 feet from the East line (Unit ~~P~~) of Section 8, Township 26 North, Range 12 West, NMPM, San Juan County, New Mexico. ✓

THE DIVISION DIRECTOR FINDS THAT:

- (1) The application has been duly filed under the provisions of Rule 701(B) of the Division Rules and Regulations;
- (2) Satisfactory information has been provided that all offset operators and surface owners have been duly notified;
- (3) The applicant has presented satisfactory evidence that all requirements prescribed in Rule 701 will be met; and
- (4) No objections have been received within the waiting period prescribed by said rule.

IT IS THEREFORE ORDERED THAT:

The applicant herein, is hereby authorized to complete its Frontier Well No. 1-A located 1750 feet from the South line and 790 feet from the East line (Unit ~~P~~) of Section 8, Township 26 North, Range 12 West, NMPM, San Juan County, New Mexico, in such manner as to permit the injection of salt water for disposal purposes into the Point Lookout formation at approximately 3708 feet to 3922 through 2 3/8-inch plastic-lined tubing set in a packer located at approximately 3608 feet.

EXHIBIT "A"

INJECTION WELL MONITORING GUIDANCE

Frontier Well No.1-A

Section 8, Township 26 North, Range 12 West, San Juan County, New Mexico

AMENDED DIVISION ORDER SWD-583

A. INJECTION MONITORING

- 1) At a time when injection into the well has been determined to be stabilized, but not to exceed six months from initial injection, the operator shall run an injection profile. This type of injection profile will be run again at the one year mark and at three year intervals thereafter. *If, after Division review of the 3rd year injection profile, no fluid migration from the intended injection interval is indicated, the Division may rescind the requirement for subsequent profiles.* The injection profiles will always be witnessed by a representative of the Division. Such profiles shall be run in accordance with the following guidelines, items 2) through 9).
- 2) All injections profiles shall be a combination of temperature and radioactive tracer logs.
- 3) All log curves shall be started (finished) at a minimum of 200 feet above the top perforation. If the well is on vacuum or goes on vacuum within 30 minutes of shutting in the well, temperature curves will be run a) while injecting, b) 30 minutes after shut-in, c) 1 hour after shut-in, and d) 2 hours after shut-in. If the well is holding surface pressure at the conclusion of the tracer studies, temperature curves will be run a) while injecting, b) 1 hour after shut-in, c) 2 hours after shut-in, and d) 4 hours after shut-in.
- 4) Radioactive tracer runs shall start at a minimum of 150 feet above the top perforation and consist primarily of an "intensity" type survey. The initial recorded runs through the radioactive material should have a minimum of 6 inches chart deflection immediately above any anticipated loss interval. The tracer intensity shall be recorded until the R/A residual falls below 1 chart division deflection over background.
- 5) The "velocity" type and "drop shot" type surveys are not required but may be run at the discretion of the operator of the well.
- 6) A "no flow" interval should be established immediately below the bottom perforation or, a percentage or rate of movement below the perforated interval should be calculated.
- 7) Channel (leak) checks should be made first at the bottom perforation and finally

at the top perforation. The R/A "burst" or "slug" should be of very high intensity and recorded on time-drive for a minimum of 5 minutes. At the conclusion of the time-drive survey, the logger shall drop below the remaining R/A material and make a number of depth-drive (log through) runs until the existence or severity of any channeling or leak is determined. Every effort should be made to establish the top or bottom of the channel(s) if one exists. If there is a severe channel, this might include "unloading" the R/A ejector tool at the top or bottom perforation in an attempt to saturate the fluid moving in the channel. The logging unit operator should be able to allocate the usage of R/A material so as to leave no doubt about the existence and severity of channels or leaks at these two positions.

8) If any channeling exists, the Division representative on location shall make the determination, based on their judgement as to the severity of the channel or leak, to immediately shut the well in or not.

9) Copies of all logs shall be forwarded to the District office and the Division office of the Oil Conservation Division. After reviewing the results in the Division office, a final determination shall be made as to the future status of the well.

B. MECHANICAL INTEGRITY TESTING

Prior to commencing injection operations into said well and every 5 years thereafter, the casing shall be pressure tested to 500 psi and monitored for 30 minutes. A successful test will be that which has lost no more than 10 percent (50 psi) for the duration of the test.

IT IS FURTHER ORDERED THAT:

The operator shall take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.

The casing shall be pressure tested as described in Exhibit "A", from the surface to the packer setting depth to assure the integrity of said casing.

The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface or left open to the atmosphere to facilitate detection of leakage in the casing, tubing, or packer.

The injection well or system shall be equipped with a pressure limiting device which will limit the wellhead pressure on the injection well to no more than 742 psig.

Subsequent to implementation of injection operations, the operator shall run injection profile logs as described in, and at intervals specified in Exhibit "A" attached hereto. Such logging operations shall be witnessed by a representative of the Division.

The Director of the Division may authorize an increase in injection pressure upon a proper showing by the operator of said well that such higher pressure will not result in migration of the injected fluid from the Dakota formation. Such proper showing shall consist of a valid step-rate test run in accordance with and acceptable to this office.

The operator shall notify the supervisor of the Aztec district office of the Division of the date and time of the installation of disposal equipment and of the mechanical integrity test so that the same may be inspected and witnessed.

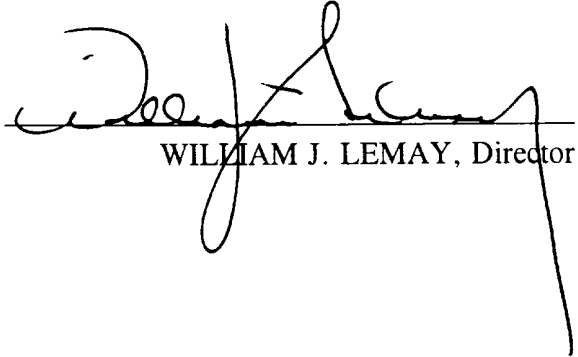
The operator shall immediately notify the supervisor of the Aztec district office of the Division of the failure of the tubing, casing, or packer in said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

PROVIDED FURTHER THAT, jurisdiction of this cause is hereby retained by the Division for the entry of such further order or orders as may be deemed necessary or convenient for the prevention of waste and/or protection of correlative rights; upon failure of the operator to conduct operations in a manner which will ensure the protection of fresh water or in a manner inconsistent with the requirements set forth in this order, the Division may, after notice and hearing, terminate the injection authority granted herein.

The operator shall submit monthly reports of the disposal operations in accordance with Rule Nos. 706 and 1120 of the Division Rules and Regulations.

The injection authority granted herein shall terminate one year after the effective date of this order if the operator has not commenced injection operations into the subject well, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

Approved at Santa Fe, New Mexico, on this 8th day of September, 1995.


WILLIAM J. LEMAY, Director

WJL/BES

xc: Oil Conservation Division - Aztec ✓

J.K. EDWARDS ASSOCIATES, INC.

OIL & GAS PROPERTIES

1401 17TH STREET / SUITE 1400

DENVER, COLORADO 80202

303/298-1400 FAX 303/298-0757

CERTIFIED MAIL - RETURN RECEIPT

August 2, 1995

Mr. Frank Chavez
New Mexico Oil Conservation Division
1000 Rio Brazos Road
Aztec, Nm 87410

Re: Application to Inject
Frontier A#1 Well
SE/4 Section 8-T26N-R12W
San Juan County, New Mexico

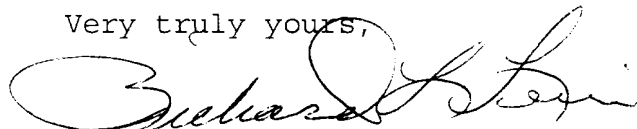
RECEIVED
AUG - 7 1995
OIL CON. DIV.
DIST. 3

Dear Mr. Stogner:

J. K. Edwards Associates, Inc. desires to plug back the referenced Gallup well to the Mesaverde formation and complete it as a water disposal well. The proposed injection well will be used for produced water from the Fruitland coal gas wells and Gallegos Gallup producers in the Gallegos field area.

Attached is one copy of the completed C-108. If additional information is required, please contact me at (303) 298-1400.

Very truly yours,



Richard L. Lewis
Contract Landman

RLL:ll
encls.

RECEIVED
AUG - 7 1995

APPLICATION FOR AUTHORIZATION TO INJECT **OIL CON. DIV.**
DIST. 3

- I. PURPOSE: Secondary Recovery Pressure Maintenance ☒ Disposal Storage
Application qualifies for administrative approval? Yes No
- II. OPERATOR: J. K. EDWARDS ASSOCIATES, INC.
ADDRESS: 1401 17TH Street, Suite 1400, Denver, CO 80202
CONTACT PARTY: Keith Edwards PHONE: (303) 298-1400
- III. WELL DATA: Complete the data required on the reverse side of this form for each well processed for injection. Additional sheets may be attached if necessary.
- IV. Is this an expansion of an existing project: Yes ☒ No
If yes, give the Division order number authorizing the project _____
- V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
- VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
- VII. Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected;
 2. Whether the system is open or closed;
 3. Proposed average and maximum injection pressure;
 4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
 5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).
- *VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.
- IX. Describe the proposed stimulation program, if any.
- * X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted.)
- * XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
- XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
- XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
- NAME: J. Keith Edwards TITLE: President
SIGNATURE: *J. Keith Edwards* DATE: 8/2/93
- * If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstance of the earlier submittal. _____

APPLICATION FOR AUTHORIZATION TO INJECT
Form C-108 Supplemental Data
Frontier 1-A Well

I. Water Disposal

II. J. K. Edwards Associates, Inc.
1401 17th Street, Suite 1400
Denver, CO 80202
Contact: J. Keith Edwards (303) 298-1400

III. Well data is attached.

IV. This is not an expansion of an existing project.

V. Map with area of review is attached.

VI. -

VII. Data on proposed injection operations:

1. Average injection rate - 500 bwpd
Maximum injection rate - 1000 bwpd
2. Closed system. Water would be trucked or piped into tanks on locations.
3. Average injection pressure - 750 psi
Maximum injection pressure - 1100 psi
4. Produced Fruitland Coal water with TDS of 2000 to 10000 ppm will be injected into the Mesaverde zone in the Frontier #1-A well. Analyses of coal water in the area are attached.
5. Chemical analysis of water in the Mesaverde zone will be submitted after plugging back the well from its current TD of 5100' in the Gallegos Gallup zone.

VIII. Geologic and Lithologic data on injection zone:

1. Injection zone - Point Lookout (Mesaverde) at approximately 3708' - 3922'.
2. Lithology - Point Lookout (Mesaverde) sands.
3. Overlying aquifer - Cliffhouse Menefee
Underlying aquifer - Mancos

J.K. EDWARDS ASSOCIATES, INC.

OIL & GAS PROPERTIES

1401 17TH STREET / SUITE 1400

DENVER, COLORADO 80202

303/298-1400 FAX 303/298-0757

CERTIFIED MAIL - RETURN RECEIPT

August 2, 1995

BUREAU OF LAND MANAGEMENT
FARMINGTON RESOURCE AREA
1235 La Plata Highway
Farmington, NM 87401

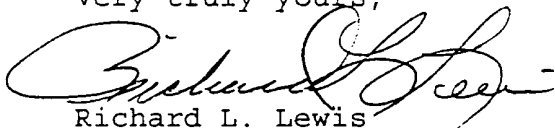
Re: Application to Inject
Frontier A#1 Well
SE/4 Section 8-T26N-R12W
San Juan County, New Mexico

Gentlemen and Ladies:

Pursuant to the regulations of the NMOCD, you are advised of JKEAI's intention to plug back the referenced well to the Mesaverde formation and use it as a salt water disposal well. I am enclosing a copy of the application for your reference.

Any request for information or any objections should be filed with the Oil Conservation Division, State Land Office Building, P.O. Box 2088, Santa Fe, NM 87501 within 15 days of publication in the Farmington Daily Times.

Very truly yours,



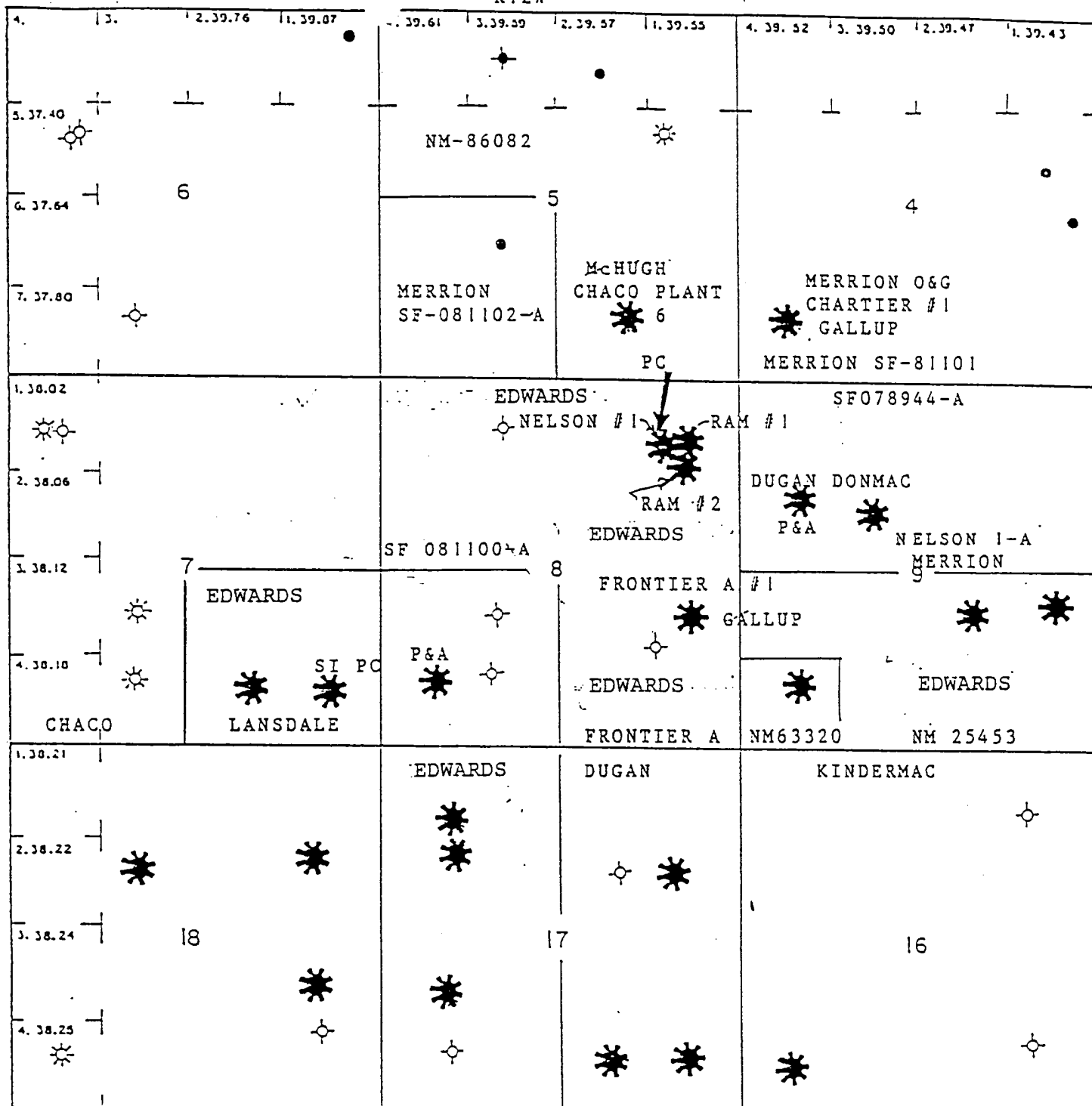
Richard L. Lewis
Contract Landman

RLL:ll
encls.

APPLICATION FOR AUTHORIZATION TO INJECT C-108 FRONTIER 1-A
page 2

- IX. Perforate and acidize prior to injection operations.
- X. Logs traversing the Mesaverde zone have been submitted previously.
- XI. No known sources of potable water exist in the immediate area of the well.
- XII. Geologic studies of the area do not indicate fault communication between the proposed injection zone and any underground potential sources of drinking water.
- XIII. Proof of notice is attached.
- XIV. Certification is signed.

R12W



APPLICATION FOR AUTHORIZATION TO INJECT
FORM C-108 AREA OF REVIEW PROXIMITY MAP

INJECTION WELL DATA SHEET

Tubing Size 2-3/8" lined with _____ set in a _____
 (type of internal coating)
 _____ packer at _____ feet

Other type of tubing / casing seal if applicable _____

Other Data

1. Is this a new well drilled for Injection? Yes ☒ No ☐

If no, for what purpose was the well originally drilled? _____

 Oil & Gas Producer-Gallup formation

2. Name of the Injection formation Point Lookout (Mesaverde)

3. Name of Field or Pool (If applicable) Gallagos Gallup field

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e., sacks of cement or plug(s) used. 4892' - 4933' 2JSPP

4995' - 5025' 2JSPP

5. Give the names and depths of any over or underlying oil or underlying oil of gas zones (pools) in this area.

Fruitland, Pictured Cliffs, Mesaverde, Gallup

INJECTION WELL DATA SHEET

OPERATOR J.K. EDWARDS ASSOCIATES, INC. LEASE NM SF-080008
 WELL NO. Frontier A#1 1750'FSL, 790'FEL 8 26N 12W
 FOOTAGE LOCATION SECTION TOWNSHIP RANGE

Schematic

Well Construction Data

SEE ATTACHED

Surface Casing

Size 10-3/4" " Cemented with 150 SX 3% Calc sx.
 TOC surface feet determined by circulate to surf.
 Hole Size 12-1/4"

Intermediate Casing

Size 7-5/8" " Cemented with see* sx.
 TOC 2225' feet determined by Temp Survey
 Hole Size 9-7/8"

* 100 SX reg
 100 SX poz
 50 SX Neat

Long String

Size 5-1/2" " Cemented with 150 SX pos sx.
 TOC 3870' feet determined by top of liner
 Hole Size 6-3/4"
 Total Depth 5100'

Injection Interval

apx 3708 feet to apx 3922 feet
 (perforated or open-hole; Indicate which)

WELL NAME: FRONTIER A NO. 1

LOCATION: 1750' FSL, 790' FEL, Sec. 8, T26N, R12W
COUNTY: San Juan STATE: New Mexico
LEASE: SF-080008 TYPE: Federal SURFACE:
OPERATOR: J.K. EDWARDS ASSOCIATES, INC.

GLE - 5989'
KBE - 5999'
KBM - 10'

SURFACE CASING:

HOLE SIZE: 12-1/4"
CASING: 10-3/4"
CSA: 173'
CEMENT: 150 SX 3% CACL
CIRC TO SURFACE

FORMATION TOPS:

FRUITLAND: 917'
PICT CLIFFS: 1137'
LEWIS: 1453'
CLIFFHOUSE 2025'
MENELEE:
POINT LOOKOUT: 3708
MANCOS: 3922'
UPPER GALLUP: 4760

WELL DATA:

SPUD DATE: 8/08/57
ORIGINAL OWNER: EPNG/BED
IP: 1044 MCFD
ZONE: LOWER GALLUP
COMPL: SWF 40,000# SAND
WI: 100% NRI:
TUBING: 2-3/8"
ROD STRING: 3/4"
PUMP SIZE: 2 X 1-1/2"
PUMP JACK:
SPM: SL:

TOP CEMENT: 2225'
TEMP SURVEY

PERFORATIONS:

4897'-4933' 2JSPF
4995'-5025' 2JSPF

3870'
INTERMEDIATE CSG:

HOLE SIZE: 9-7/8"
SIZE: 7-5/8"
WT & GR: 25.4# J-55
CSA: 3930'
DEPTH: 3940'
CEMENT: 100 SX REG
100 SX POZ
50 SX NEAT

3940'

LINER:

HOLE SIZE: 6-3/4"
SIZE: 5-1/2"
WT & GR: 15.5#
LSA: (1233') 3870'-5106'
TD: 5100'

CEMENT: 150 SX REG, 150 SX POZ

SEE BACK FOR REMARKS.

5-7-55 Spud date, Company tools, Rig #C-99302.
Ran 4 joints 9 5/8", 25.4#, Armco spiral weld casing (161') set at 171' with 125 sacks regular cement circulated to surface. Held 500# 30 minutes.

5-10-55 DST #1: 1172-1226, op. 1 hr. 5 min., g-t-s 5 min. ggd. 108 MCF init. stab @ 124' MCF in 30 min, rec. 150' g-c-m, IFP 90#, FFP 120#, SIP 295# in 30 min. HH 560#.
DST #2: 1227-1314, op. 1 hr. 10 min. wk. blow air immed. decreased to v. wk in 1 hr. by passed, no inc. in 10 min. SI 30 min. rec. 360' sl. g & fr w-c-m, IFP 60#, FFP 235#, SIP 295#, HH 595#.

5-12-55 Tight Hole.

5-15-55 DST #3: 3035-3057, op. 25 min. Wk. blow air immed, died 25 min. by passed op. 15 min. wk blow air immed. died in 15 min. rec. 95' g-c-m, IFP 0#, FFP 90#, SIP 1110#, in 30 min. HH 1630#.

5-19-55 DST #4: 3920-3958, op. 5 min. very weak blow air immed, died 2", by passed, op 5 min. weak blow air died 2 mm rec. 130' Ø mud, IFP 0#, FFP 0#, SIP 90#, in 30 min HH 2150#.

5-24-55 DST #5: 4599-4655, op. 15 min. wk. blow air immed. died 5 min. by passed, no blow rec. 8' Ø mud. IFP 60#, FFP 60#, SIP 120#, in 30 min. HH 2490#.

5-25-55 Ran Schlumberger ES & ML to 4707.

5-26-55 Core #1: 4760-4774, rec. 12'8" of sl. sdy. sh w/no shows.

5-27-55 Core #2: 4778-4798 rec. 20' interbed sd & sh w/vert fract asphaltic oil along fract.

5-28-55 Core #3: 4860-4880 rec. 19'4" of sd & sh. Bottom 4" of core very sandy.

5-29-55 Core #4: 4880-4900, rec. 20' sdy sh & ss w/vert fract 14 in. conglom ss @ 4885.
DST #6: 4855-4900, op. 1 hr. 20 min. very strong blow air immed. g-t-s 4 min. Gdg. 930 MCF init. stab at 1009 MCF in 30 min. rec. 150' h-g-c-m, IFP 120#, FFP 120#, SIP 1515# in 30 min. HH 2490#.

5-30-55 Core #5: 4900-4919, rec. 16'8" sdy sh. & sh.
DST #7: 4900-4919, op 1 hr. 15 min. wk. blow air immed. died 1 hr. 10 min. SI 30 min. Rec. 240' g-c-m, IFP 120#, FFP 235#, SIP 1430#, HH 2490#.

6-1-55 Core #6: 4980-5000, rec. 10'5" tight brown sand.
DST #8: 4975-5002, op. 1 hr. 40 min. S BAI, g-t-s 3 min. ggd. 458 MCF init. stab @ 517 MCF in 30 min. rec. 80' g-c-m, IFP 128#, FFP 125#, SIP 1580#, in 30 min. HH 2585.

6-2-55 Core #7: 5002-5022, rec. 4'7" of brn hd. tight. shaly qtzitic ss.

6-3-55 Core #8: 5022-5042, rec. 17' of hd. tight brn. ss w/int. bedded dk. gry sh.
DST #9: 5001-5042, op. 1 hr. 30 min. S.B.A.I, g-t-s 18 min. ggd. 76 MCF init. 46 to 90 in heads thereafter. SI 30 min. Blew out 23 stands. Rec. undetermined amnt. highly gas and slightly oil cut mud. IFP 795#, FFP 1430#, SIP 1880#, HH 2510#.

6-4-55 DST #10: 5003-5042, op. 4 hr. 30 min. SBAI g-t-s 21 min. ggd. 70 MCF in "heads" SI 45 min. No rec. reversed circ. IFP 5.5, FFP 1455, SIP 1795, HH 2510.

6-5-55 DST #11: 5042-5089, Op. 2 hr. 20 min. Fair BAI decreased to very weak. SI 30 min. Rec. 420' g & sl o-c-m, IFP 140#, FFP 235#, SIP 1835#, HH 2530#.

6-7-55 Core #9: 5280-5285, rec. 3 1/2' irreg. interbedded f-gr. ss & sh w/calcite.
Core #10: 5285-5305, rec. 17 1/2' of domin. sh. w/some ss in top 6'. Vert fract. in top 4'.

6-8-55 Ran Schlumberger ES to 5422, TS & ML to T.D. 5420'.

6-9-55 Ran 163 joints 7", 23#, & 20#, J-55 casing (5201') set at 5211'. Second stage cementing collar at 1503. Cemented first stage with 100 sacks regular cement and 100 sacks Pozmix, 100# Flocele & 4% Gel. Held 1000# 30 min. Top of cement on first stage by temperature survey at 3701'. P.B. total depth 5169'.

6-10-55 Cemented second stage with 100 sacks regular cement, 100 sacks Pozmix, 100# Flocele & 4% Gel. Held 1000# 30 min. Top of cement on second stage by temp. survey at 190'.
Blowing hole dry.

6-12-55 Perf. 5022-5028 w/2 shots/ft. gaged 808 MCF/D 30 min. after perf.

6-13-55 Perf. 5016-5022 w/2 shots/ft. gaged 1580 MCF/D 30 min. after perf. Started making 2" stream of mud. Blew well for 3 hrs. 2" stream decreased to 1/2" - 1" of muddy water. Gaged 2780 MCF/D.

6-14-55 Gaged 3640 MCF/D. Set Howco bridge plug at 5012'.
Perf. 5003-5009 w/2 shots/ft. gaged 3940 MCF/D after 1 hrs. blow.
Perf. 4997-5003 w/2 shots/ft. gaged 3780 MCF/D in 30 min.
Perf. 4991-4997 w/2 shots/ft. gaged 3880 MCF/D in 30 min.
Perf. 4987-4991 w/2 shots/ft. gaged 3880 MCF/D in 30 min.

6-15-55 Let pressure build up to max. 1100# in 2 hr. gaged 3970 MCF/D at 6:45 AM.
 Gaged 4020 MCF @ 12 noon. Set Howco bridge plug at 4937'.
 Perf. 4886-4888 w/2 shots/ft. gaged 405 MCF/D after 1 hr. 30 min.
 Perf. 4888-4894 w/2 shots/ft. 1 hr. pr. up to 200#, blew down w/no increase in gas. Ran Schlumberger (GR) 700' - 1500' & 4600-4935'.
 6-16-55 Perf. 4894-4900 w/2 shots/ft. gaged 536 MCF/D.
 Perf. 4900-4902 & 4882-86. Gas logged off. Blowing well.
 6-17-55 Blowing dry. Pr. up for 2 hr. & blew down. Made 2" stream muddy water & decreased to dripping off of flow line. Blew thru 2" swedge to 1" for 1 hr. small blow.
 Wait on Schlumberger. Pressure up 1 hr. & blew 1 hr. small blow made 2 hr. water test. No water or mud & no increase in gas.
 6-18-55 Perf. 4886-4894 w/4 bullets/ft. Gaged 49 MCF/D in 1 hr. found mud & water at approx. 2500'. Blowing well. Set DOC squeeze retainer @ 4735'. Squeezed perf. 4882' - 4902' w/100 sks DOC (95 sks. into formation) Breakdown pr. 700#, max. pressure 1500#, final pressure 1400#.
 6-20-55 Blowing csg. dry. Gaged 407 MCF/D.
 Perf. 4850' to 4862' w/2 jet shots & 4 bullets/ft. gaged 486 MCF/D before perf. and 500 MCF/D after perf. Drilled up bridge plug at 4937'.
 6-21-55 Drilled bridge plug at 5012' & cleanout to 5169'. Gaged 4,600 MCF & ran 163 jts. 2" tubing (5041') landed at 5051'.
 7-6-55 Date well was tested.

J.K. EDWARDS ASSOCIATES, INC.

OIL & GAS PROPERTIES

1401 17TH STREET / SUITE 1400

DENVER, COLORADO 80202

303/298-1400 FAX 303/298-0757

CERTIFIED MAIL - RETURN RECEIPT

August 2, 1995

Jerome P. McHugh & Associates
Nassau Resources, Inc.
Kindermac Partners
Attn: Land Department
650 South Cherry St., Suite 1225
Denver, CO 80222

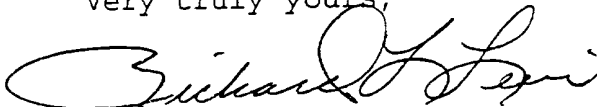
Re: Application to Inject
Frontier A#1 Well
SE/4 Section 8-T26N-R12W
San Juan County, New Mexico

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Very truly yours,



Richard L. Lewis
Contract Landman

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DENVER, COLORADO 80202

303/298-1400 FAX 303/298-0757

Post-it* Fax Note	7671	Date	7-27-95	# of pages	2
To	MARY LOY	From	RICK LEWIS		
Co./Dept.		Co.	JKEA1		
Phone #	505-326-0234	Phone #	303 298-1400		
Fax #		Fax #			

July 27, 1995

Farmington Daily Times
Legal Department
P.O. Box 450
Farmington, NM 87499

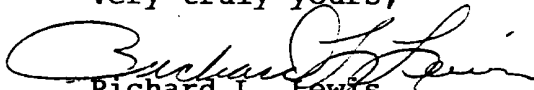
Re: Notice of Water Disposal Well

Gentlemen and Ladies:

Attached please find the referenced notice which J. K. Edwards Associates, Inc. would like run in the legal notice section of the Farmington Daily Times. Please run this notice for one day only and include in the next possible issue.

If you should have any questions, please do not hesitate to call me or Ms. Ann Fedlman at the above number.

Very truly yours,


Richard L. Lewis
Contract Landman

Needs to be filed in the legal section of the Farmington Daily Times and copy returned to J. K. Edwards, Associates, Inc.

NOTICE

J. K. Edwards Associates, Inc., 1401 17th Street, Suite 1400, Denver, CO 80202, (303)298-1400 whose agent is Keith Edwards, hereby notifies all interested parties that the following well is to be converted to a water disposal well. Injection will be into the Point Lookout (Mesaverde) interval at approximately 3708' - 3922'. Maximum well rate will be 1000 Bwpd at less than 1100 psi. Any request for information or any objections should be filed with the Oil Conservation Division, State Land Office Building, P.O. Box 2088, Santa Fe, NM 87501 within 15 days of this notice.

Gallegos Gallup Field, Frontier 1-A, NE/4SE/4 Section 8, T26N-R12W, San Juan County, New Mexico.

J.K. EDWARDS ASSOCIATES, INC.

OIL & GAS PROPERTIES

1401 17TH STREET / SUITE 1400

DENVER, COLORADO 80202

303/298-1400 FAX 303/298-0757

CERTIFIED MAIL - RETURN RECEIPT

August 2, 1995

MERRION OIL AND GAS CORPORATION
Attn: Land Department
610 Reilly Avenue
P.O. Box 840
Farmington, NM 87499

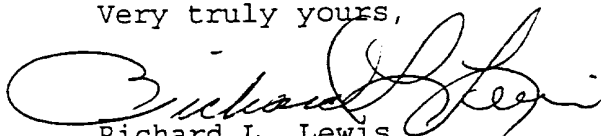
Re: Application to Inject
Frontier A#1 Well
SE/4 Section 8-T26N-R12W
San Juan County, New Mexico

Gentlemen and Ladies:

Pursuant to the regulations of the NMOCD, you are advised of JKEAI's intention to plug back the referenced well to the Mesaverde formation and use it as a salt water disposal well. I am enclosing a copy of the application for your reference.

Any request for information or any objections should be filed with the Oil Conservation Division, State Land Office Building, P.O. Box 2088, Santa Fe, NM 87501 within 15 days of publication in the Farmington Daily Times.

Very truly yours,



Richard L. Lewis
Contract Landman

RLl:ll
encls.

J.K. EDWARDS ASSOCIATES, INC.

OIL & GAS PROPERTIES

1401 17TH STREET / SUITE 1400

DENVER, COLORADO 80202

303/298-1400 FAX 303/298-0757

CERTIFIED MAIL - RETURN RECEIPT

August 2, 1995

DUGAN PRODUCTION COMPANY

Attn: Land Department

P.O. Box 420

Farmington, NM 87499

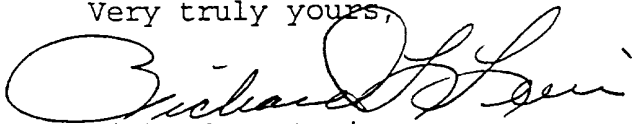
Re: Application to Inject
Frontier A#1 Well
SE/4 Section 8-T26N-R12W
San Juan County, New Mexico

Gentlemen and Ladies:

Pursuant to the regulations of the NMOCD, you are advised of JKEAI's intention to plug back the referenced well to the Mesaverde formation and use it as a salt water disposal well. I am enclosing a copy of the application for your reference.

Any request for information or any objections should be filed with the Oil Conservation Division, State Land Office Building, P.O. Box 2088, Santa Fe, NM 87501 within 15 days of publication in the Farmington Daily Times.

Very truly yours,



Richard L. Lewis
Contract Landman

RLL:ll
encls.

WALSH ENGINEERING & PRODUCTION

WORKOVER AND COMPLETION REPORT

Operator: J. K. Edwards & Assoc. Well Name: FRONTIER A¹
 Date: 2/16/94 Report No: 1
 Field: Lower Galloway County: S.D. State: N.M. SE 8 T26N R12W
 Contractor: PALANCE Bros Supervisor: Paul Thompson
 Work Summary:

MOL & R.D. PALANCE Bros RIG. DISCONNECT PRODUCTION EQUIPMENT AND MOVE OUT
 OF THE WAY. TOOK W/ 12' POLISHED ROD, 2', 2' AND 4' PUMP ROD (5/8"); AND 197 5/8" RODS
 COUPLING ON LAST ROD WAS CORRODED N.D. WELL HEAD AND N.U. ROD. TOOK W/ 71
 STANDS OF 2 3/8" TUBING WAS FREE OF SIG AT THIS POINT. P.U. NEW BOX IN 5/8" ROD
 AND TIE. SERVICED INTO PARTED ROD. TOOK W/ RODS AND PUMP. RECOVERED 1 MORE ROD
 (199 TOTAL) AND 12' RWBC PUMP. TOOK W/ 11 MORE STANDS OF 2 3/8" (164 JTS TOTAL),
 SERVING NIPPLE, 4' TOLERATED ROD AND PLUNGED AND ANCHOR. BOTTOM OF TUBING WAS SET AT
 545' (PAPER 1997-5035). P.U. M.T. STATES 5 1/2" RETRIEVABLE BRIDGE PLUG AND
 PACKER AND TIE ON 2 3/8" TUBING. RAN 20 STANDS AND SHUT DOWN FOR NIGHT.

Daily Costs:

Road & Location
 Rig Cost
 Equipment Rental
 Logging & Perforating
 Stimulation
 Testing
 Cementing
 Completion Fluids
 Contract Services
 Miscellaneous Supplies
 Engr. & Supervision
 Trucking 300
 Other

1400
190
300

Tubulars
 Wellhead Equipment
 Subsurface Equipment
 Artificial Lift Equipment
 Sucker Rods
 Tanks
 Pressure Vessels
 Flowlines
 Installation/Labor
 Fittings, Valves, Etc...
 Meters, Last, Etc...
 Electrical Equipment
 Total Daily Cost
 Cumulative Cost

1890
1890

Well Record									
Pulled from well				Equipment		Run in well			
1"	7/8"	3/4"	5/8"	Sucker Rod Count		1"	7/8"	3/4"	5/8"
Rod case				Pump		Rod tube			
API Pump Size				Tubing Ordon		API Pump Size			
Depth				Case or Mud Anchor		Depth			
Length				Perforated Nipple		Length			
Length				Casing Nipple		Length			
Size				Tubing Count		Size			
Length				Anchor Catcher		Length			
Tubing Size				Packer		Tubing Size			
Type						Tubing joints			
						Type			
						How Set			
						Type			

CHEMICAL & GEOLOGICAL LABORATORIES

Casper

Farmington

Glendive

Sterling

WATER ANALYSIS REPORT

Field Bisti, New Mexico Well No. CSU No. 28
Operator Sunray Mid-Continent Oil Company Location NW SW 9-25N-12W
Sampled by Date
Formation Gallup Depths 4750 - 4800 How sampled From treater
Other pertinent data Sample No. 1

Analyzed by DM & DS Date October 2, 1959 Lab. No. 14747-1

CONSTITUENTS	PPM	MEQ.	MEQ. %	TOTAL SOLIDS IN PARTS PER MILLION:
Sodium - - - -	16,789	729.95	47.13	By evaporation 46,030
Calcium - - - -	608	30.34	1.96	After ignition 44,560
Magnesium - - -	162	13.32	0.86	Calculated 44,929
Sulfate - - - -	10	0.21	0.01	
Chloride - - - -	27,000	761.40	49.21	
Carbonate - - -	-	-	-	
Bicarbonate - -	732	12.00	0.78	
Hydroxide - - -	-	-	-	

PROPERTIES OF REACTION IN PERCENT:

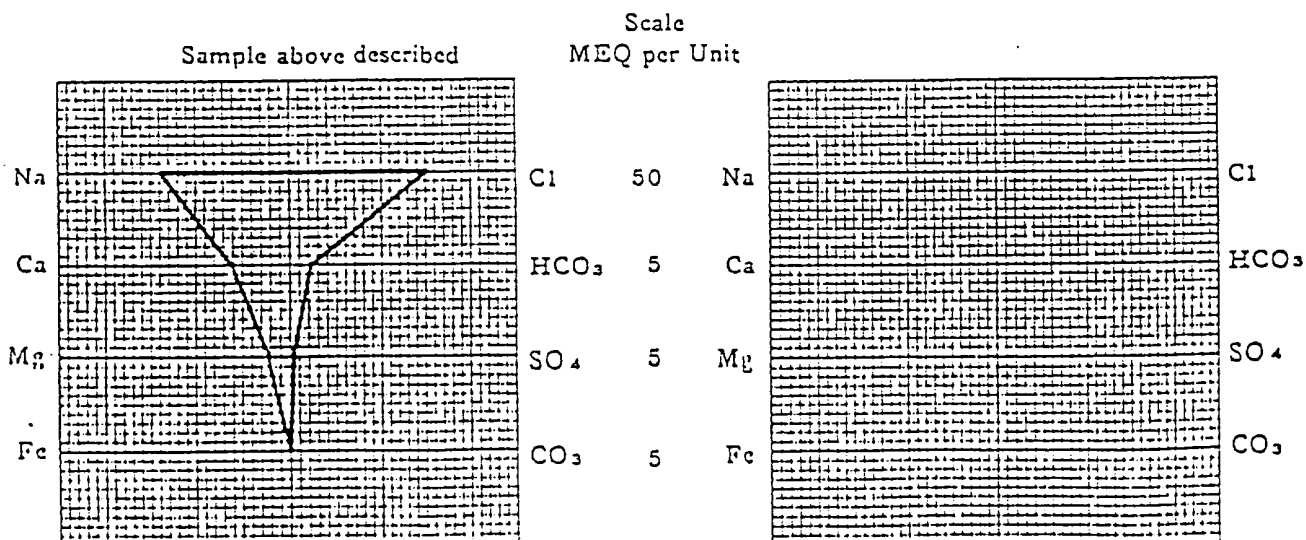
Primary salinity	94.36
Secondary salinity	4.08
Primary alkalinity	0.00
Secondary alkalinity	1.56
Chloride salinity	99.98
Sulfate salinity	0.02

Observed pH. 7.6 Resistivity @ 68°F. ohms/meter 0.190

Remarks Sampled as known Gallup water.

Note: PPM=Milligrams per liter (1 PPM is equivalent to 0.0001% by weight). MEQ=Milliequivalents per liter. MEQ%=Milliequivalents per liter in percent.

WATER ANALYSIS PATTERN



CHEMICAL & GEOLOGICAL LABORATORIES

Casper Farmington Glendive Sterling

WATER ANALYSIS REPORT

Field Bisti, New Mexico Well No. CBU No. 29
Operator Sunray Mid-Continent Oil Company Location. NE SE 8-25N-12W
Sampled by Date.
Formation Gallup Depth 4750 - 4800 How sampled From Treater
Other pertinent data Sample No. 2

Analyzed by DM & DS Date October 2, 1959 Lab. No. 14747-2

CONSTITUENTS	PPM	MEQ.	MEQ. %	TOTAL SOLIDS IN PARTS PER MILLION:
Sodium - - - -	18,064	785.37	47.15	By evaporation..... 49,490
Calcium - - - -	646	32.24	1.94	After ignition..... 48,400
Magnesium - - -	185	15.21	0.91	Calculated..... 48,350
Sulfate - - - -	10	0.21	0.01	
Chloride - - - -	29,000	817.80	49.10	
Carbonate - - -	-	-	-	
Bicarbonate - -	903	14.81	0.89	
Hydroxide - - -	-	-	-	

PROPERTIES OF REACTION IN PERCENT:

Primary salinity.....	94.30
Secondary salinity.....	3.92
Primary alkalinity.....	0.00
Secondary alkalinity.....	1.78
Chloride salinity.....	99.98
Sulfate salinity.....	0.02

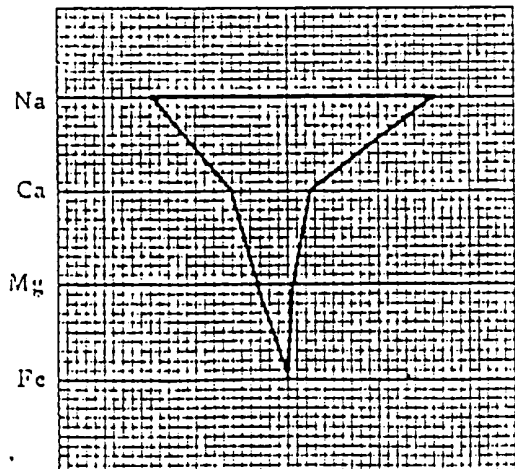
Observed pH... 7.2 Resistivity @ 68°F.
ohms/meter³ 0.165

Remarks... Correlates with Gallup water from this area and with water from CBU No. 28
sampled as known Gallup water.

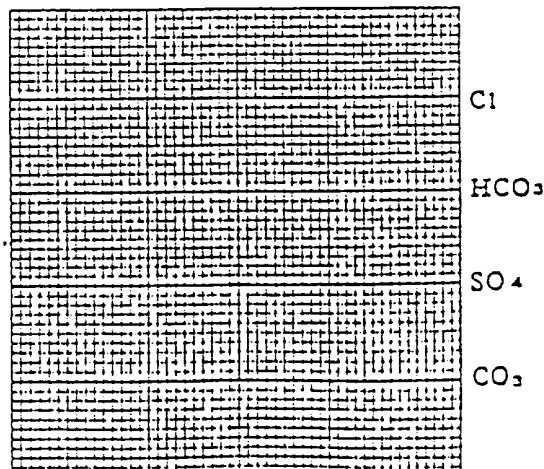
Note: PPM=Milligrams per liter (1 PPM is equivalent to 0.0001% by weight). MEQ=Milliequivalents per liter. MEQ%=Milliequivalents per liter in percent.

WATER ANALYSIS PATTERN

Sample above described Scale
MEQ per Unit



Cl 50
HCO₃ 5
SO₄ 5
CO₃ 5



Cl
HCO₃
SO₄
CO₃

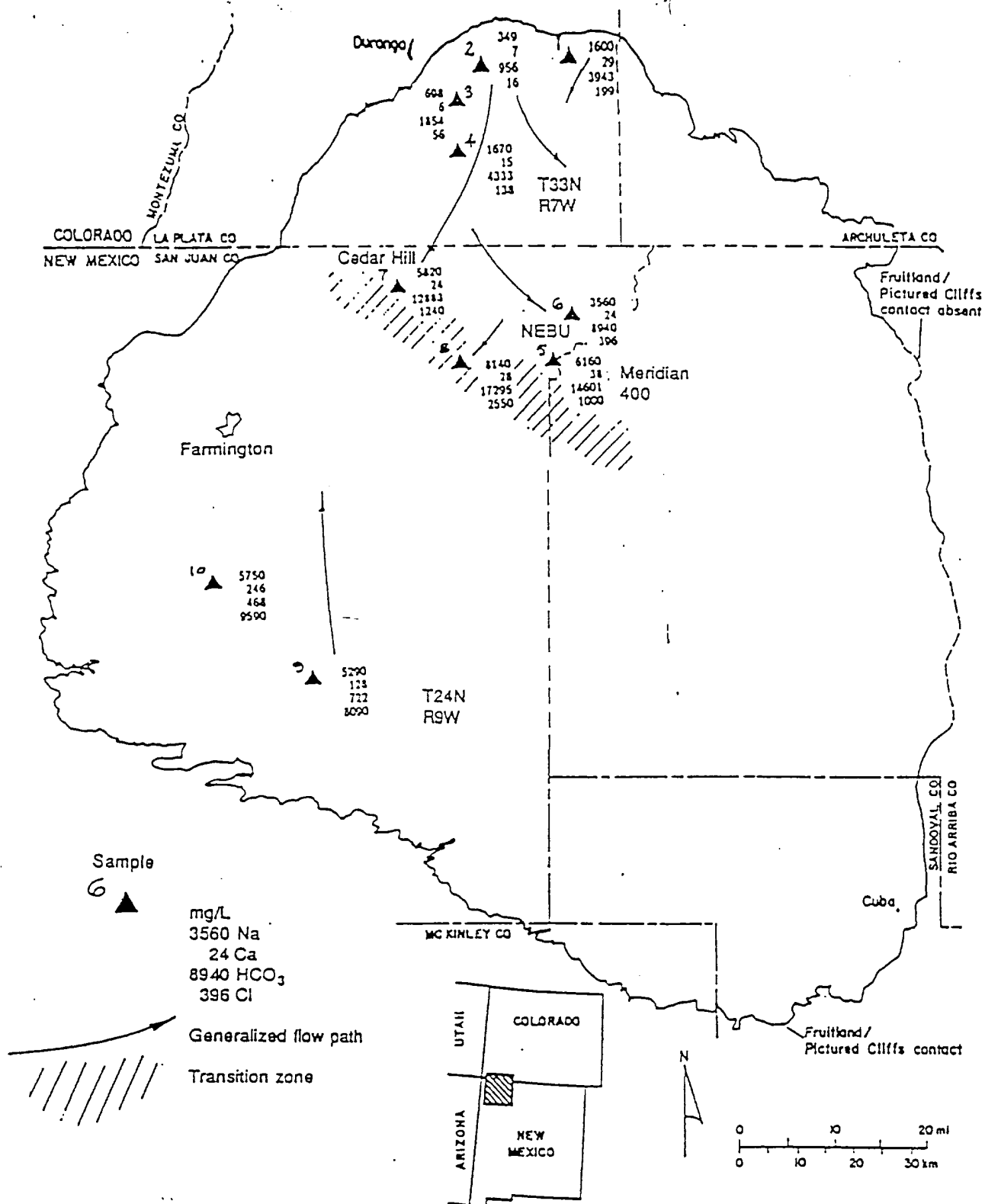


Figure 16. Location of GRI/BEG Fruitland coalbed water samples. In the north-central part of the basin, Na⁺ and HCO₃⁻ increase down flow path, reaching their highest concentration in the transition zone. Southern waters are enriched in Cl⁻ and Ca²⁺. The transition zone is a regional facies, potentiometric, pressure, and hydrochemical boundary. Complete chemical analyses in table 3.

Table 3. Chemical analyses of produced fluidland coalbed waters.

Sample Number	1	2	3	4	5	6	7	8	9	10
Well	Perry Land	Shoemaker	Southern	Mayfield-	NEBU 432	NEBU 218	Ealum Gas	Elloit Gas	Disti Coal	Rick
Location	GUB 1	1-34	Uto 12U-1	Malton GU 1			Can C IR	Can Y 1	36-1	Wells 1
Production Interval	3035N6W	3435N8W	1234N9W	133N9W	730N7W	1631N7W	3332N10W	930N9W	3625N12W	826N13W
Production Interval	1,304-1,480	1,896-2,026	2,400-2,478	2,530-2,747	3,004-3,216 (Oil)	3,200-3,346 (Oil)	2,777-2,813	2,790-2,944	1,074-1,092	1,383-1,427
Source	wellhead	wellhead	wellhead	separator ^a	separator ^a	wellhead	wellhead	wellhead	wellhead	wellhead
TDS	5,820	1,360	2,650	6,220	21,970	13,030	20,110	28,210	14,330	16,190
Na	1,600	349	698	1,670	6,160	3,560	5,820	8,140	5,290	5,750
K	9.9	4.3	5.8	5.4	19.5	13.2	33.3	53.1	22.5	27.5
Ca	20.8	6.5	5.8	15.1	37.7	24.4	23.6	28.1	128	246
Mg	6.2	1.2	1.2	4.2	27.4	17.3	15.5	15.1	36.4	57.7
Sr	4.3	0.6	0.7	5.0	17.7	13.2	12.3	19.4	6.9	12.3
Ba	6.5	0.7	1.1	6.1	62.9	21.1	36.2	51.5	8.4	7.6
Fe	0.12	0.80	0.04	0.05	0.64	0.72	1.24	0.59	0.57	2.37
Mn	0.06	0.03	0.03	0.01 ^b	0.01	0.01	0.03	0.01	0.49	0.15
Li	0.88	0.34	0.94	1.54	1.39	1.11	0.58	1.13	0.50	0.53
B	1.08	0.21	0.63	1.55	2.15	0.98	8.54	9.17	1.18	1.09
SiO ₂	21.0	22.8	26.1	31.5	26.6	27.1	24.7	26.1	12.5	15.0
Field alkalinity	3,943	956	1,054	4,333	14,601	8,940	12,883	17,295	722	468
(as HCO ₃ ⁻)										
Organic acids	270	220	210	330	330	210	210	220	120	160
(as CH ₃ COOH)										
NH ₃	2.53	1.50	1.11	4.47	11.3	8.57	9.13	16.2	4.99	6.20
organic-N	0.39	0.78	0.05	1.04	1.45	1.59	0.85	1.50	0.60	0.48
Cl	199	16	56	138	1,000	396	1,240	2,550	8,090	9,590
SO ₄	<5 ^c	<5	<5	<5	<5	<5	<5	<5	<5	10.4
Br	0.85	0.14	0.50	0.76	4.65	3.49	3.99	6.19	7.64	8.68
I	0.38	0.10	0.33	1.13	0.41	0.11	0.52	0.87	0.60	0.56
Field pH	7.65	8.21	8.23	7.73	7.62	7.09	8.06	8.02	7.39	7.33
δ ¹⁸ O _d	-14.0	-14.6	-14.6	-14.1	-7.4	-7.9	-7.7	-7.6	-10.8	-10.5
δD	-85	-98	-102	-85	-32	-43	-28	-36	-81	-80
δ ¹³ C _o	+23.5	+17.5	+16.7	+24.0	+25.6	+24.7	+25.0	+24.9	+19.7	+19.5
Σ cations (meq/L)	71.94	15.73	30.92	74.03	273.71	158.30	257.14	359.07	240.27	268.10
Σ anions (meq/L)	70.28	16.13	31.98	74.95	267.66	157.78	246.25	355.55	239.98	278.33

^a flowing well; ^b near detection limit of 0.01 mg/L; ^c detection limit 5 mg/L; ^d δ¹⁸O and δD in per mil relative to SMOW; ^e δ¹³C of total dissolved carbonate species in per mil relative to PDB.

ANALYSIS NO. 53-35-91

FIELD RECEIPT NO. _____

API FORM 45-1

API WATER ANALYSIS REPORT FORM

Company <u>Giant E&P</u>		Sample No.		Date Sampled <u>08-07-91</u>	
Field		Legal Description		County or Parish	
Lease or Unit <u>Bich Coal 3</u>		Well # <u>1</u>		Depth	
Type of Water (Produced, Supply, etc.) <u>Produced</u>		Sampling Point		Formation <u>Fruitland</u>	
				Water, B/D	
				Sampled By	

DISSOLVED SOLIDS

CATIONS

	mg/l	me/l
Sodium, Na (calc.)	<u>5473</u>	<u>237.95</u>
Calcium, Ca	<u>140</u>	<u>7.00</u>
Magnesium, Mg	<u>61</u>	<u>3.00</u>
Barium, Ba	<u>—</u>	<u>—</u>
Potassium, K	<u>98</u>	<u>2.51</u>

ANIONS

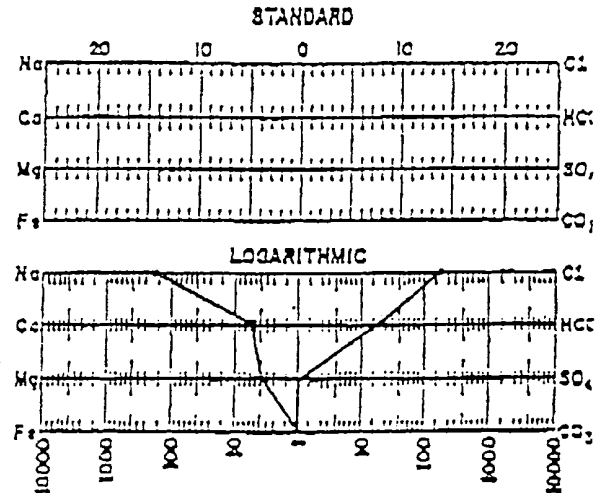
Chloride, Cl	<u>8010</u>	<u>225.96</u>
Sulfate, SO ₄	<u>0</u>	<u>0</u>
Carbonate, CO ₃	<u>0</u>	<u>0</u>
Bicarbonate, HCO ₃	<u>1617</u>	<u>26.50</u>
Hydroxide, OH	<u>0</u>	<u>0</u>

Total Dissolved Solids (calc.) 15399Iron, Fe (total) 25 ppmSulfide, as H₂S neg

OTHER PROPERTIES

pH	<u>7.25</u>
Specific Gravity, 60/60 F.	<u>1.010</u>
Resistivity (ohm-meters) <u>74</u> F.	<u>.44</u>
Total Hardness	<u>600</u>

WATER PATTERNS — me/l



REMARKS & RECOMMENDATIONS:

ANALYST: Lee

PLEASE REFER ANY QUESTIONS TO:

THE WESTERN CO. OF NORTH AMERICA
 FARMINGTON, N.M.
 BRIAN AULT-District Engineer
 (305) 327-6222



OFFICE OCC
NOV 1957

URGENT IN TELETYPE
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Order Form No. G-20
Approved August 10, 1956
Local Office: DF
Amount: 0.0000
Date: RECEIVED

SUNDY NOTICES AND REPORTS ON WELLS

REPORT OF OBSERVATION TO BUREAU	REMARKS
REPORT OF OBSERVATION TO FIELD OFFICE	REMARKS
REPORT OF OBSERVATION TO STATE DEPARTMENT	REMARKS
REPORT OF OBSERVATION TO STATE DEPARTMENT	REMARKS
REPORT OF OBSERVATION TO STATE DEPARTMENT	REMARKS
REPORT OF OBSERVATION TO STATE DEPARTMENT	REMARKS
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REPORT OF OBSERVATION TO STATE DEPARTMENT	REMARKS
REPORT OF OBSERVATION TO STATE DEPARTMENT	REMARKS
REPORT OF OBSERVATION TO STATE DEPARTMENT	REMARKS

October 31, 1957

Well No. 1-A is located 1230 ft. from the and 1231 ft. from the line of sec. 8

NE 1/4 Sec. 8 T. 24 N. R. 12 E. S. 1 M. 1 N. M.
County of San Juan State of New Mexico

The elevation of the device floor above sea level is 5993 ft.

DETAILS OF WORK

Observations of well and reported depths to oil, gas, water, and brine, and lengths of cased strings, indicate existing and potential oil, gas, and other hydrocarbon resources.

Indication to change name of El Paso Natural Gas Products Company
Frontier No. 2 to El Paso Natural Gas Products Company Frontier
No. 1-A.



Company El Paso Natural Gas Products Company

Address 900 East 1000
Farmington, New Mexico

ORIGINAL SIGNED BY: WILLIAM A. CLAENER
By
Title Geological Engineer

U.S. G.S. FORM 100-1

THE CORPORATION

TRICAL LOG
& PRODUCTION LOG

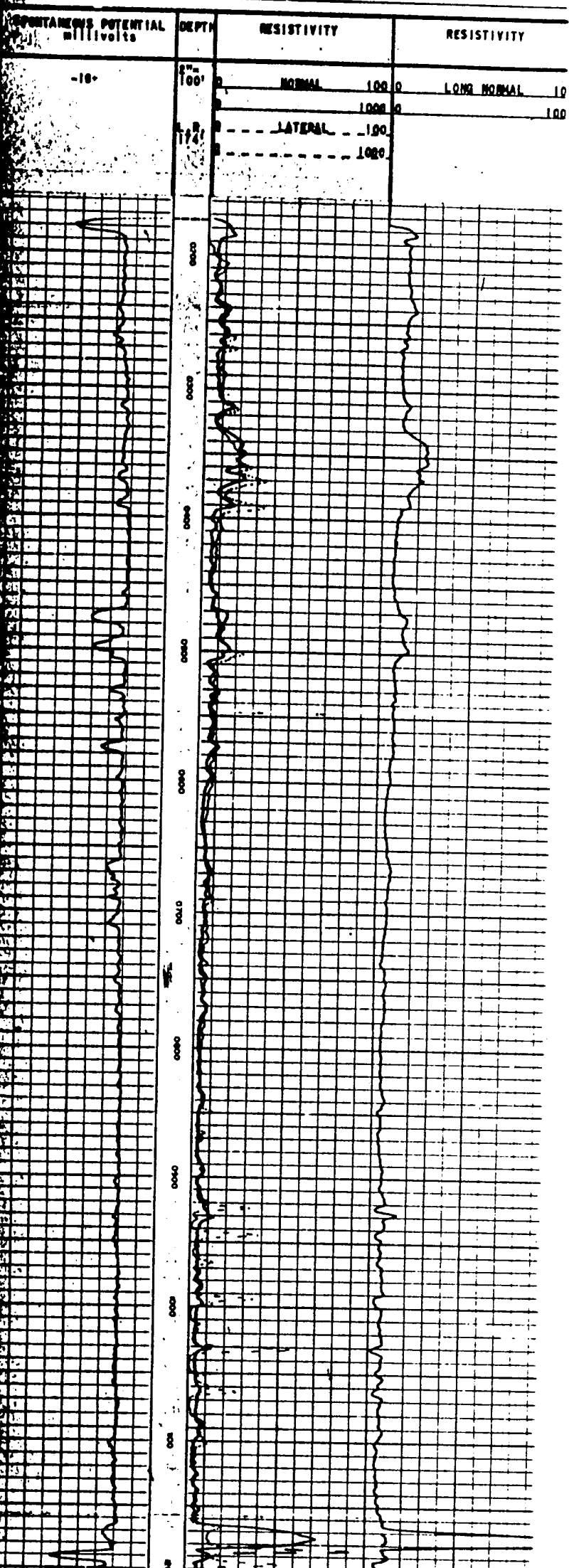
Location of Well
150' FR S/L
SEC. 8-25N-12W

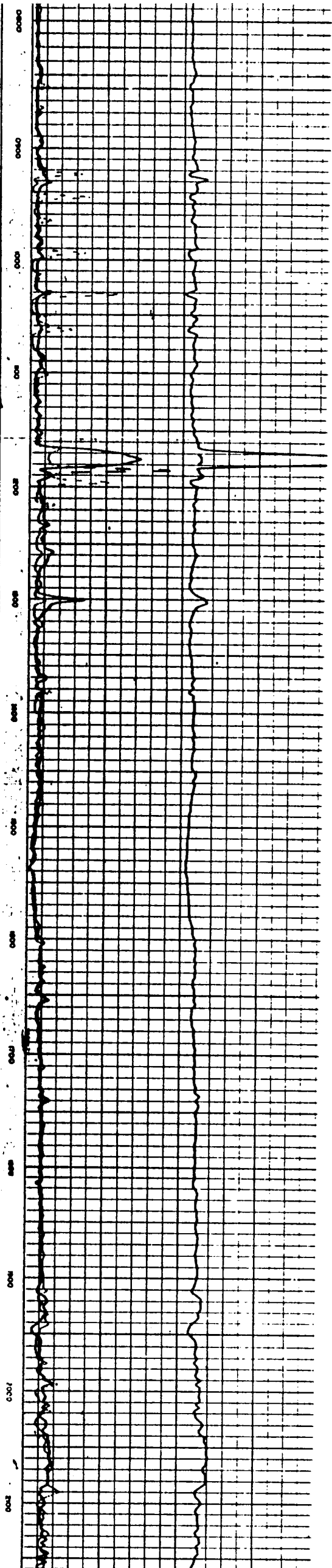
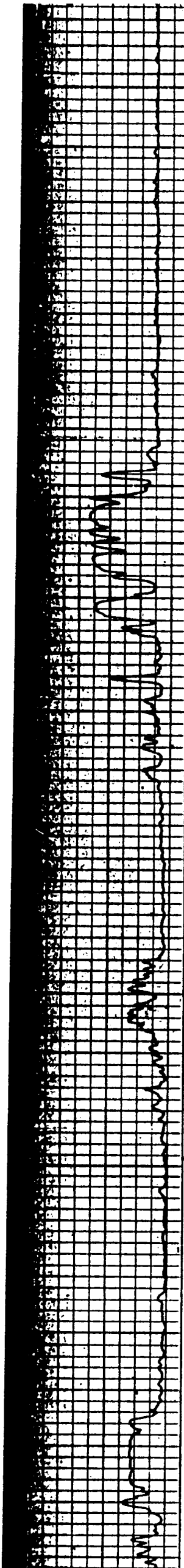
(TEMP)

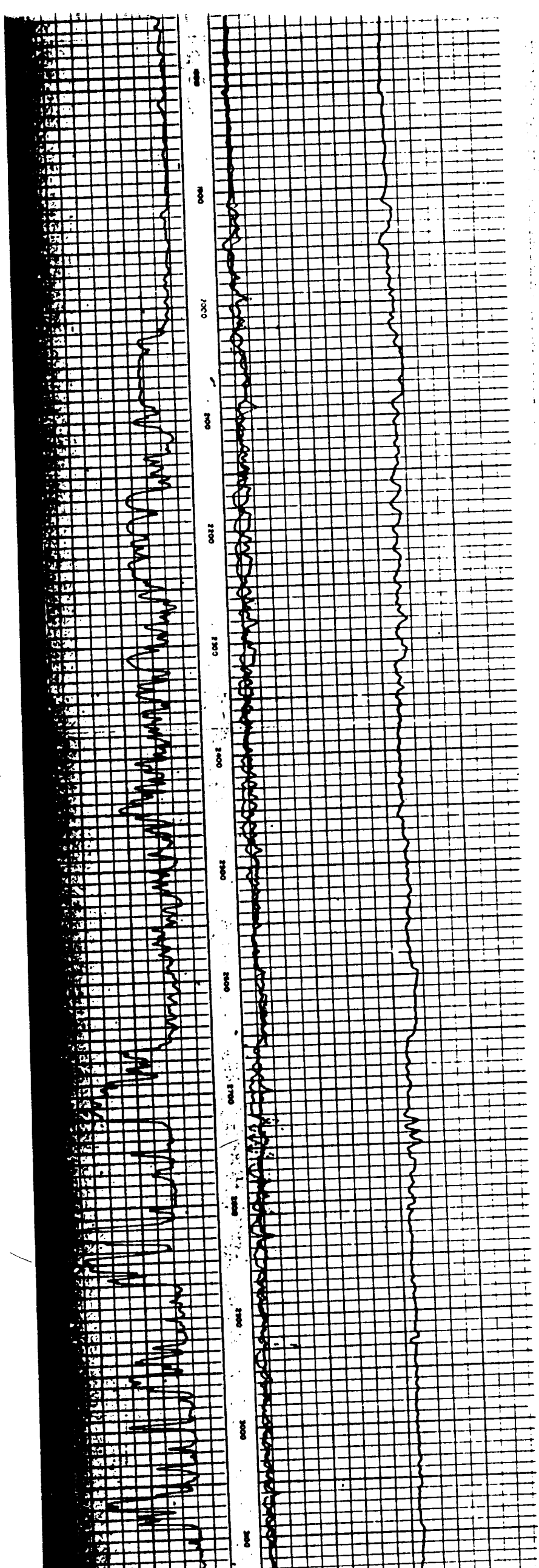
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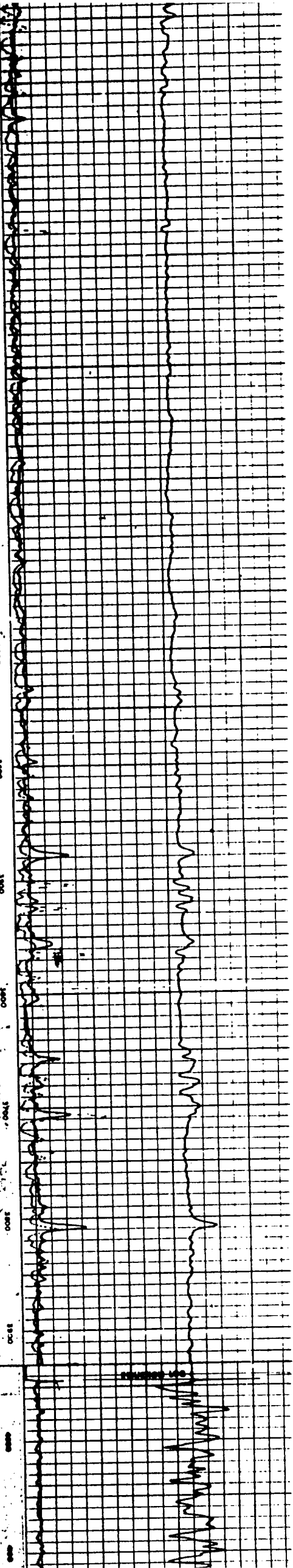
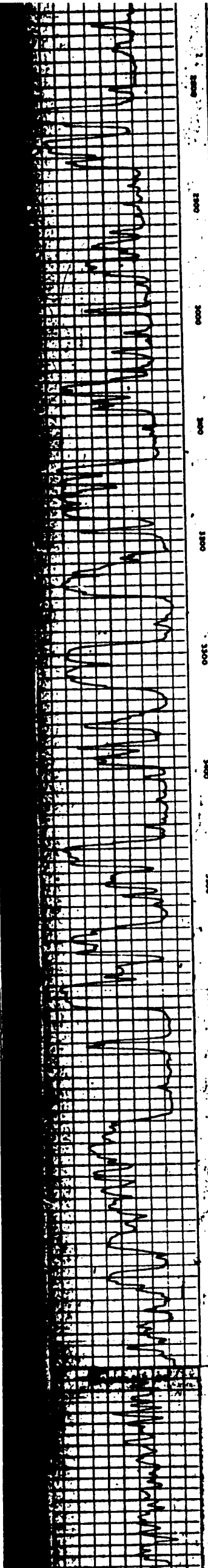
RECEIVED
DATE
BY
TIME

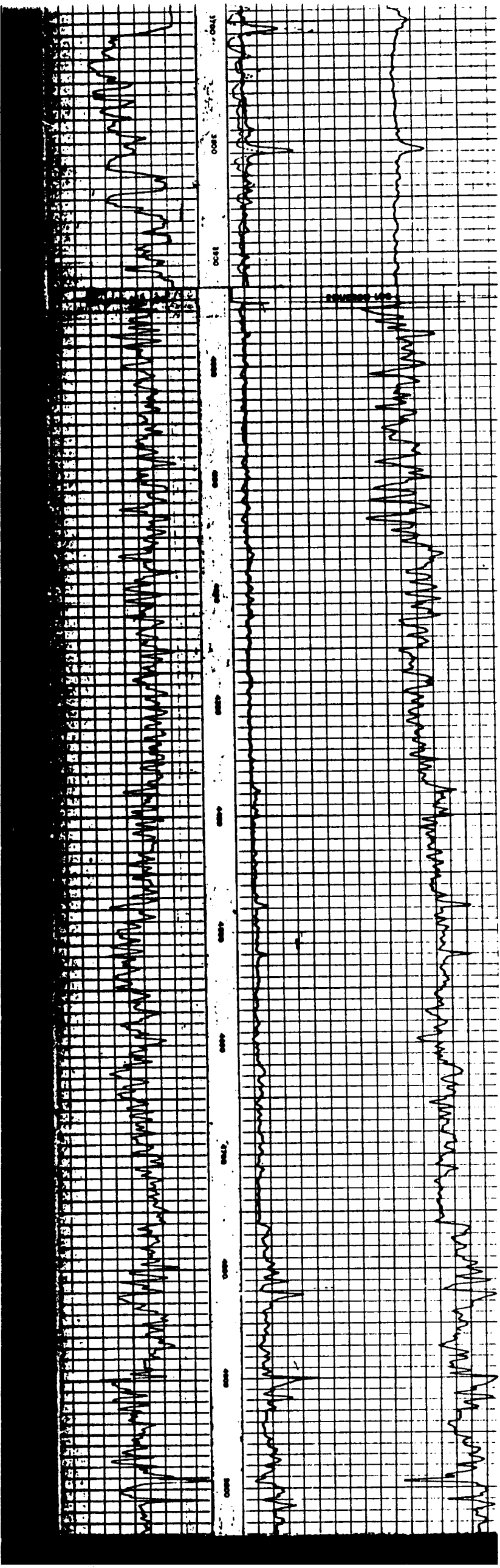
WAVELENGTH 100' IS 100' 700
WAVELENGTH 100' IS 100' 700
WAVELENGTH 100' IS 100' 700







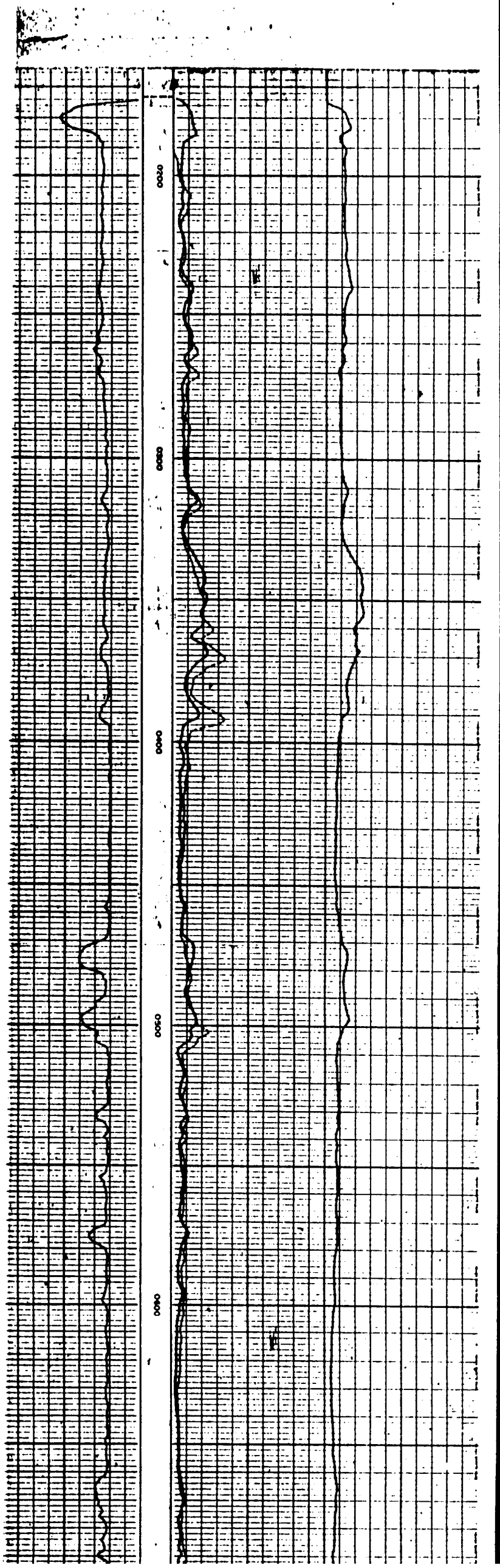


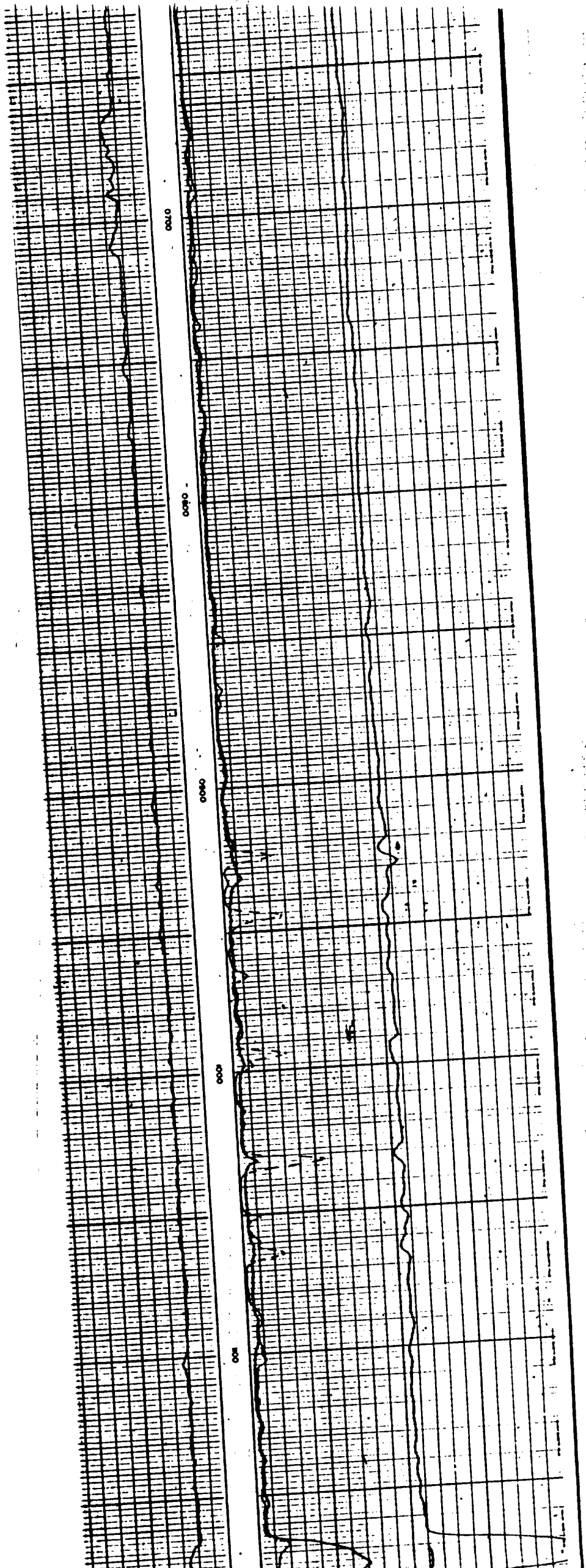


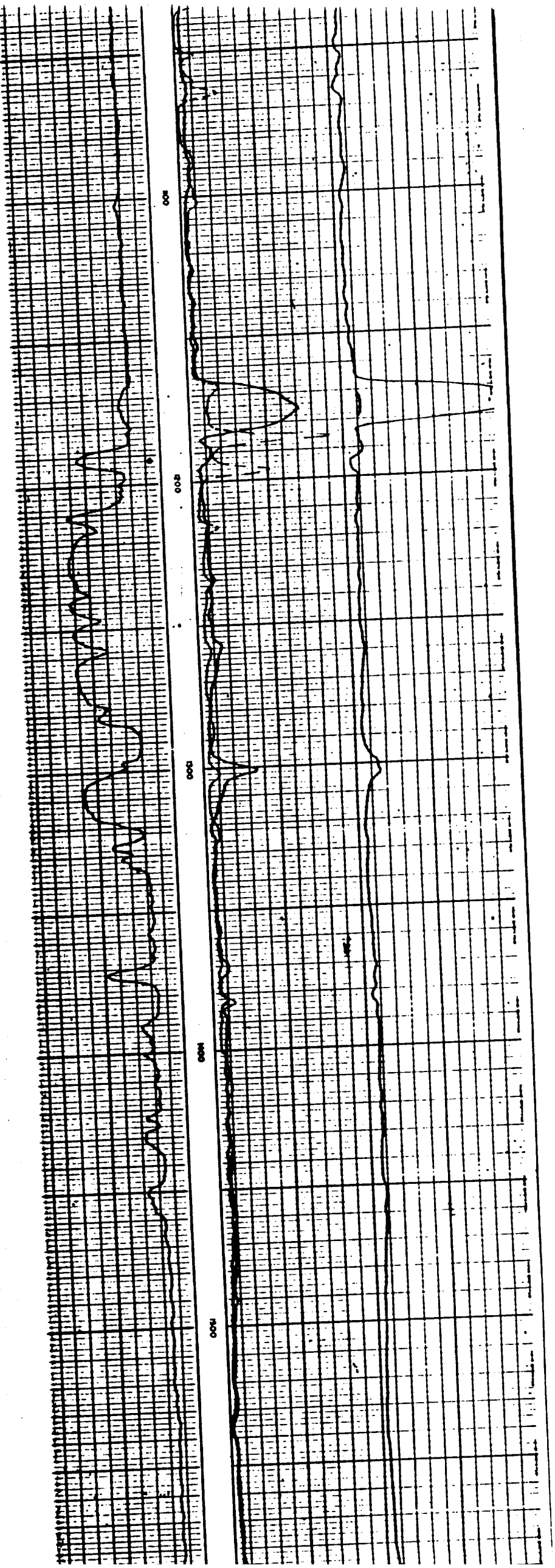
And the other side of the coin is that the more you know about the world, the more you know about yourself.

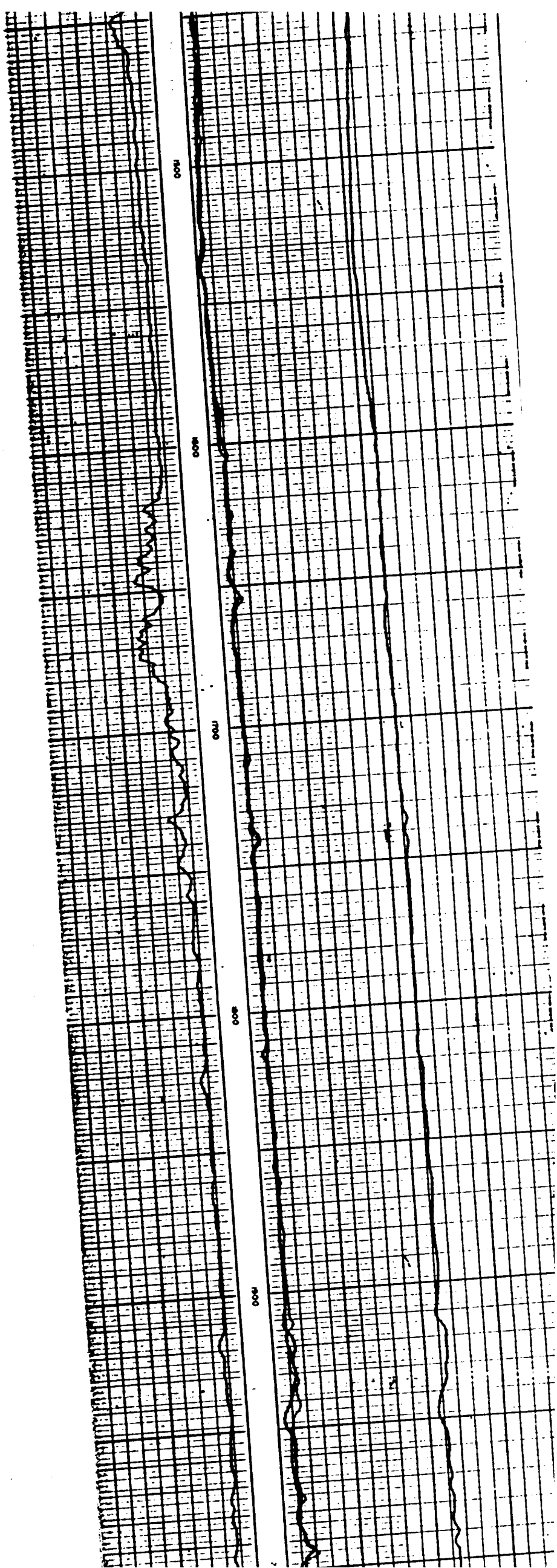
Amesbury, Mass. 10/10/1911

1. Definition
 The set of all points in a plane that are equidistant from two fixed points is called the perpendicular bisector of the line segment joining the two points.

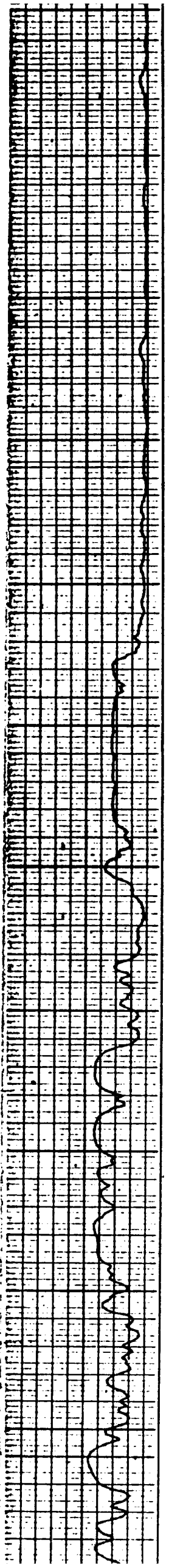


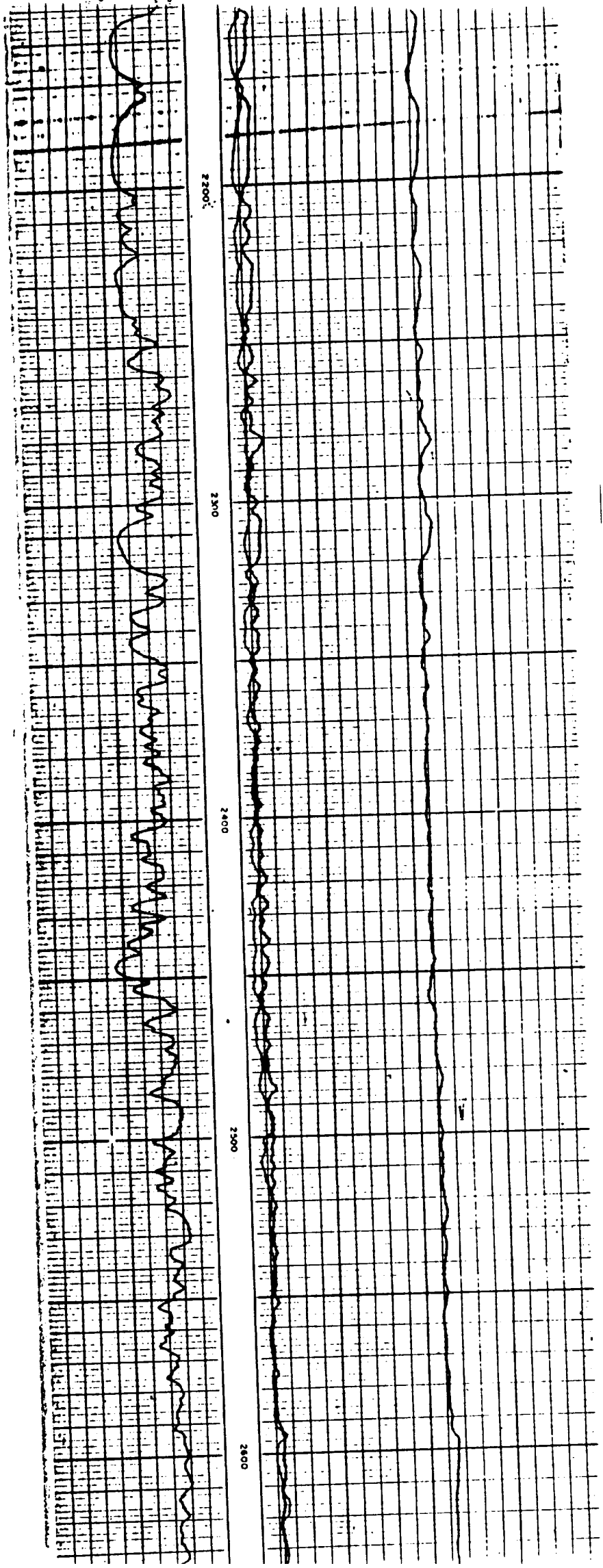


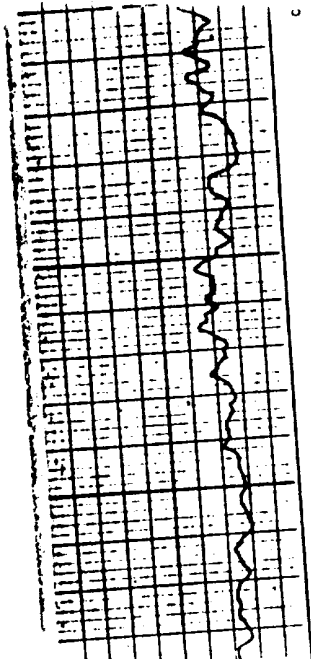
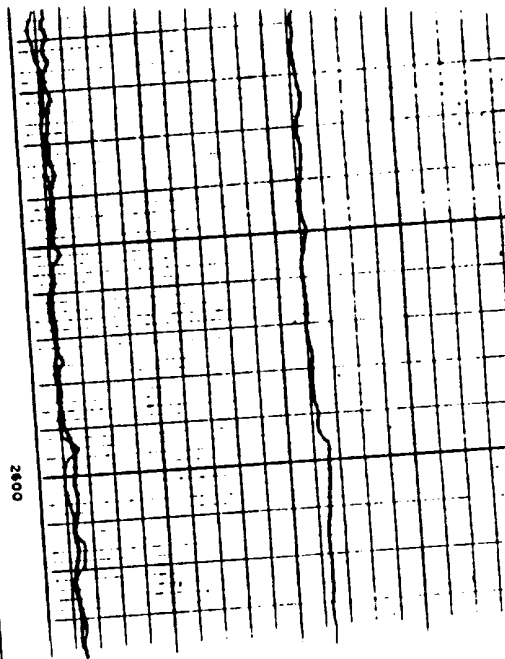


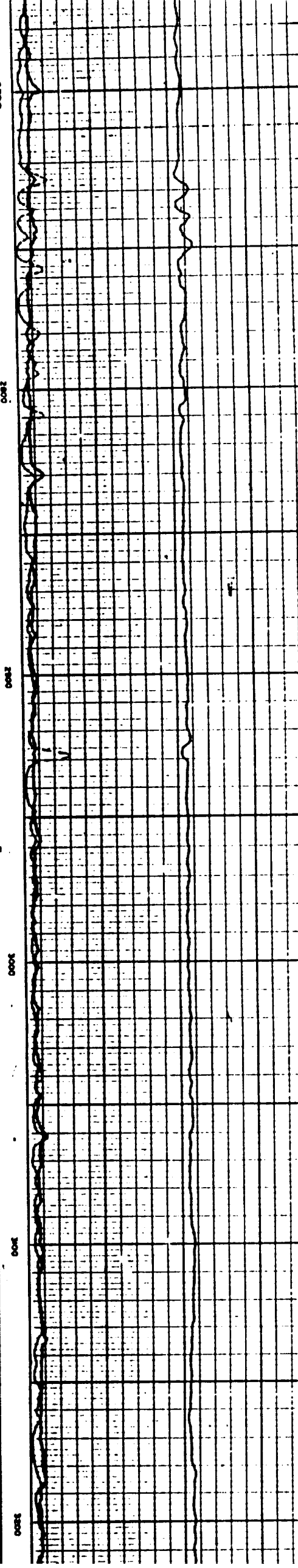
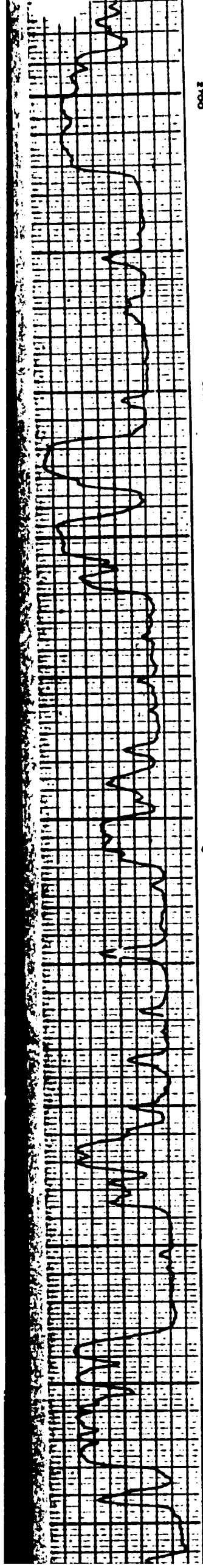


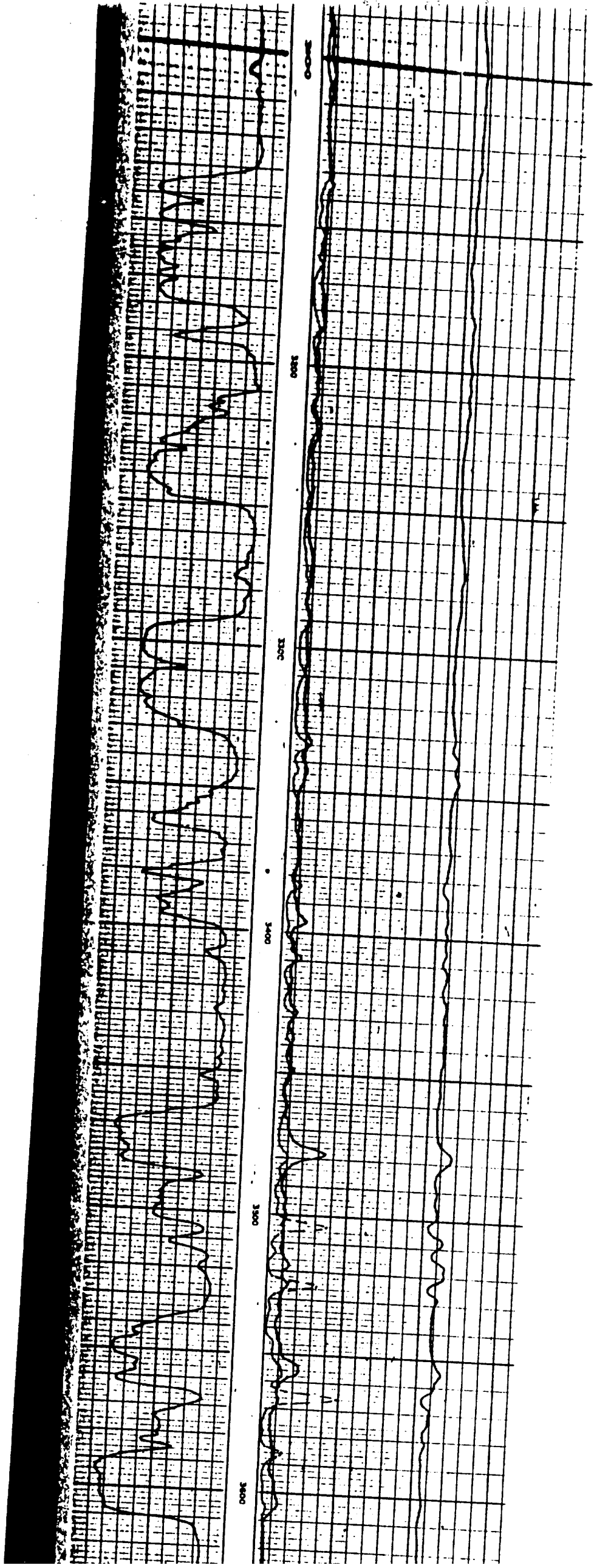
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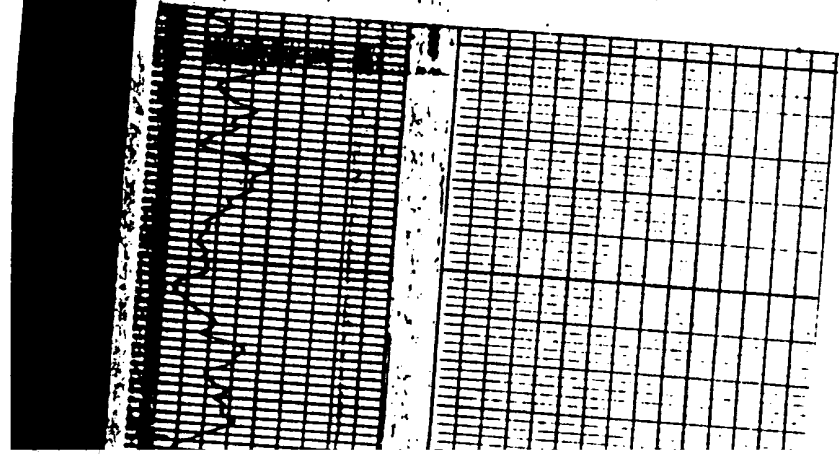
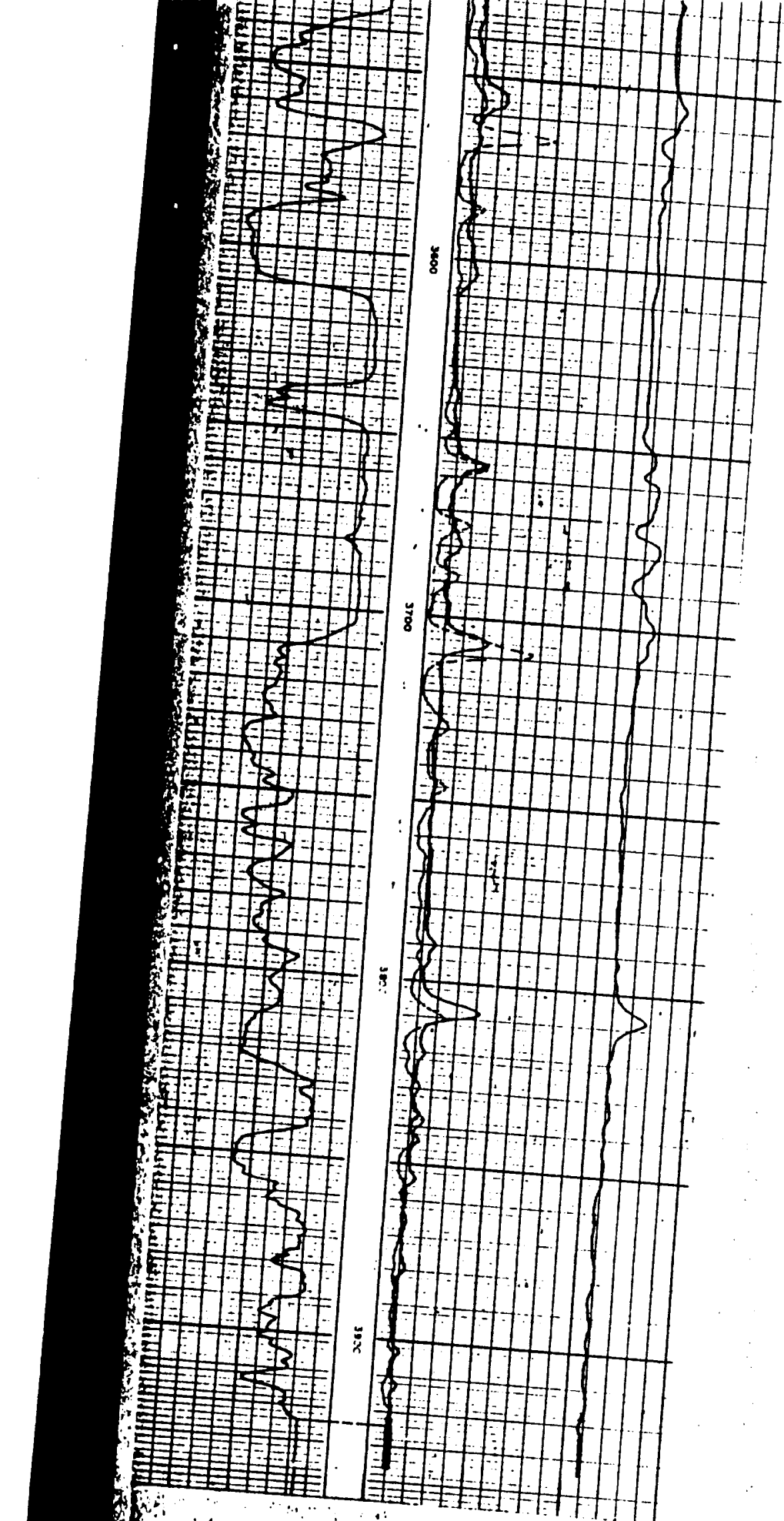


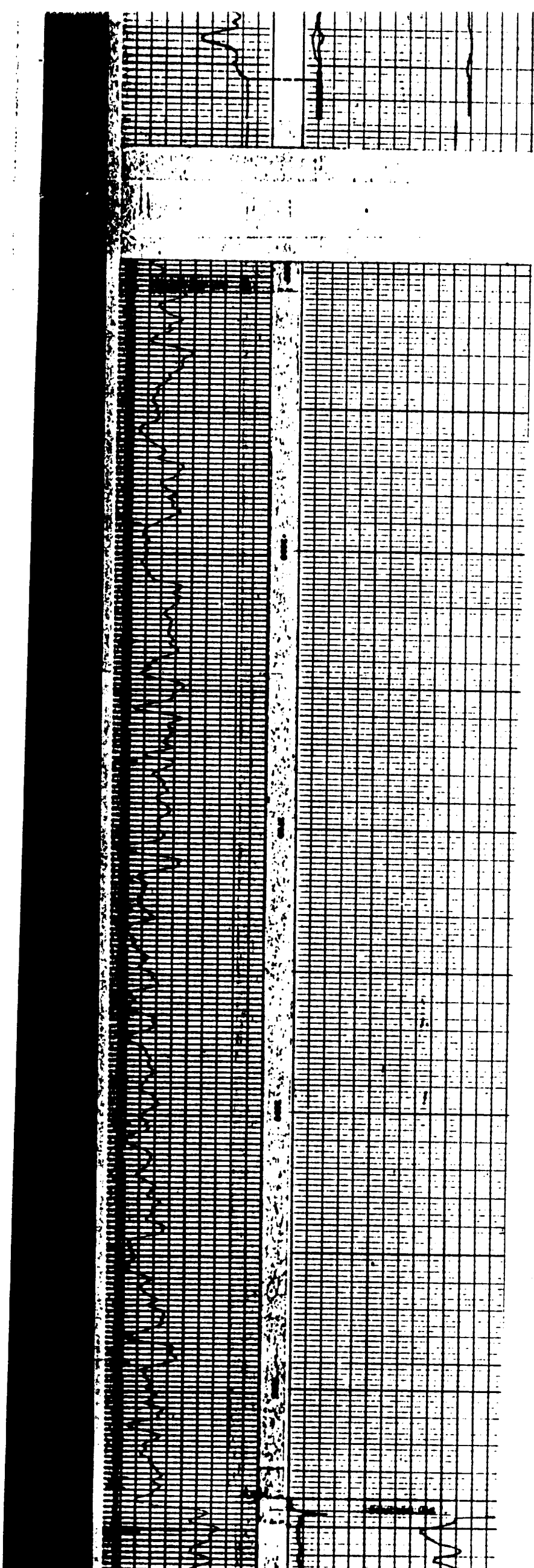






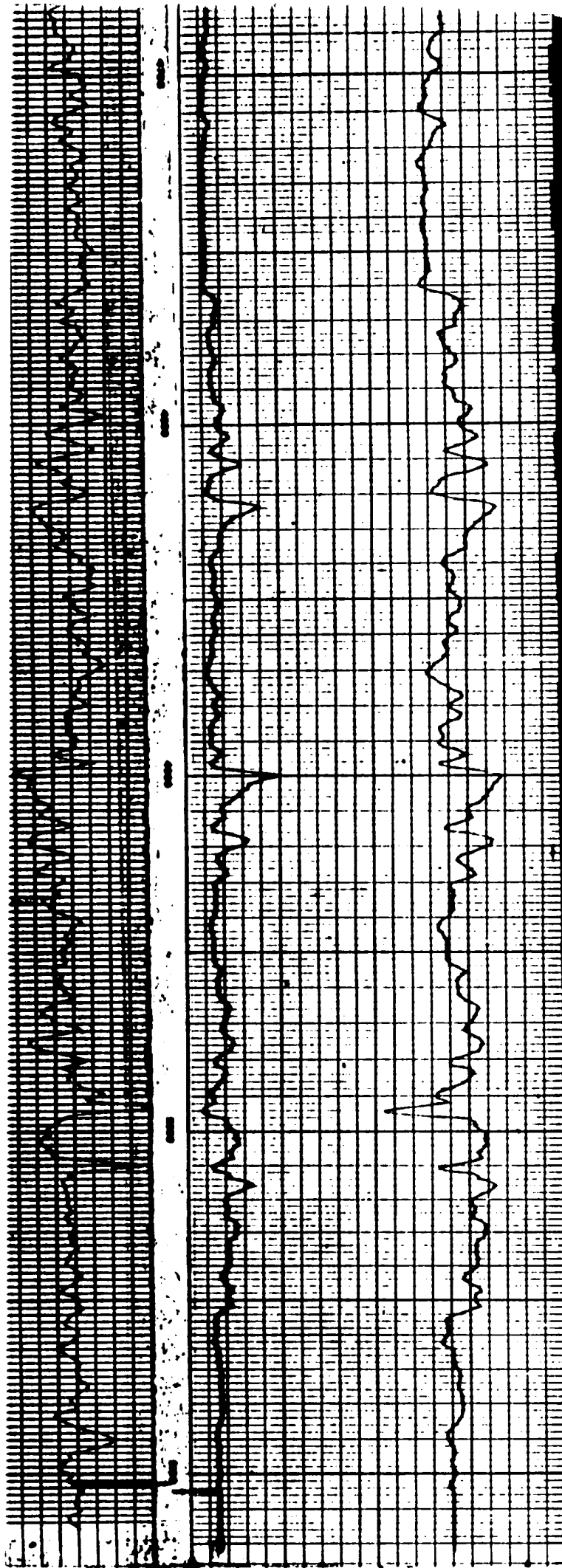






Handwritten signature: *Richard A. Auer*

[illegible]



Resistivity (ohm-ft)
DAY LOG 2 DIV.

Resistivity
ohm-ft

conductivity

WELL NO. 1100

WELL NO. 1100

EL PASO NATURAL GAS COMPANY

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