



BEFORE THE OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF COLORADO

RECEIVED
MAY 20 1985
OIL & GAS CONS. COMM.

IN THE MATTER OF THE APPLICATION)
OF ATLANTIC RICHFIELD COMPANY FOR)
AN ORDER GRANTING APPROVAL TO)
CONVERT A PRODUCING WELL TO A)
DISPOSAL WELL AND TO DISPOSE OF)
PRODUCED WATER IN SUCH WELL,)
IN A PORTION OF SECTION 31,)
TOWNSHIP 10 NORTH, RANGE 52 WEST,)
WEST PADRONI FIELD,)
LOGAN COUNTY, COLORADO)

CAUSE NO. _____

ORDER NO. _____

DOCKET NO. _____

VERIFIED APPLICATION

ATLANTIC RICHFIELD COMPANY, Applicant herein, by its attorney, respectfully petitions the Oil and Gas Conservation Commission of the State of Colorado ("Commission"), pursuant to Rule 326 of the Rules and Regulations of the Commission and states as follows:

1. Applicant is a Pennsylvania corporation duly authorized and qualified to do business in Colorado.

2. The lands which are the subject of this Application ("Subject Lands") and in which Applicant owns 100% of the working interest and operating rights are described as follows:

Township 10 North, Range 52 West
Section 31: SW/4
West Padroni Field
Logan County, Colorado

3. Applicant, pursuant to Rule 326 and other applicable Rules, proposes to convert the present marginally-producing oil well, Sindt #2 ("Subject Well"), into an underground disposal well by injecting produced water from other nearby oil wells into the Subject Well and thereby into the "J" Sand formation. The Subject Well will be designated a Class II well within the meaning of applicable Federal statutes and regulations.

4. Applicant states that the "J" Sand formation underlying the Subject Lands has been used for injection and disposal purposes by Applicant and others with the approval of the Commission, prior to the date upon which the State of Colorado assumed primacy over underground injection and disposal operations from the Federal

government, and therefore, the "J" Sand formation underlying the Subject Lands is grandfathered, making a present aquifer exemption for the "J" Sand unnecessary. Further, the "J" Sand has not served and does not presently serve as a source of drinking water and cannot serve as a source of drinking water in the future because it is situated at a depth which makes recovery of water for drinking purposes economically and technologically impractical. The "J" Sand formation underlying the Subject Lands contains total dissolved solids in excess of 7,958 milligrams per liter.

5. Applicant includes the following data and information and states as follows in conformity with Rule 326:

(1) A plat showing the location of the proposed disposal well ("Subject Well"), the location of all oil and gas wells, including abandoned and dry holes of public record, and the names of the owners of record, including the surface owners within one-quarter mile of the Subject Well, are attached hereto as Exhibit A and made a part hereof. A schematic diagram of the proposed injection/disposal system, including the Subject Well, is attached hereto as Exhibit B and made a part hereof. To the best of Applicant's knowledge and belief, no remedial work is necessary or anticipated with respect to any well within one-quarter mile of the Subject Well which penetrates the "J" Sand formation. The location of all domestic and irrigation wells of public record within one-quarter mile of the Subject Well are also depicted on Exhibit A.

(2) The formation into which the produced water is to be disposed of by injection into the Subject Well is the "J" Sand formation, a fluvial/deltaic sandstone-shale sequence located at an approximate subsurface depth underlying the Subject Lands of 4,802-4,820 feet. Applicant believes and therefore states, that no underground sources of drinking

water will be affected by the proposed operation. The "J" Sand formation underlying the Subject Lands is a water-bearing formation/aquifer with no oil production, and injection into the "J" Sand in an offsetting well, the Sindt #6, has previously been approved by the Commission.

(3) An electric log and a temperature log in the Subject Well are attached hereto as Exhibits C and D, respectively, and made a part hereof.

(4) The casing in the Subject Well consists of the following:

10-3/4" 32.75# casing set at 296' w/175 sx (cement circulated)
5-1/2" 14# casing set at 5095' w/300 sx cement

The top of the cement occurs at 4,033' subsurface (see Temperature Log, Exhibit D and schematic diagram, Exhibit B). The mechanical integrity of the casing in the Subject Well was tested on February 4, 1985, from the surface to 4,603' subsurface under 425 psi and was held for 15 minutes. Subsequent casing pressure tests and other mechanical integrity tests will be conducted in complete conformity with Rule 327 and all other applicable requirements. Average casing and tubing pressures will be monitored monthly. A narrative description of the proposed conversion operation to convert the Subject Well to a water disposal well is attached hereto as Exhibit E and made a part hereof.

(5) The source of the produced water which is to be injected into and disposed of by the Subject Well is the "O" Sand formation, a cleaner, more massive sandstone than the "J" which occurs as sandstone benches separated by silty/shaley intervals. It is typically found at a depth of approximately 5060' underlying the Subject Lands. The "O" Sand is a hydrocarbon-bearing, currently producing formation. An analysis of the water produced from the "O" Sand (water-producing formation) is contained in Exhibit F, attached hereto and

made a part hereof. An analysis of the water presently within the "J" Sand (water-receiving formation) aquifer is contained in Exhibit G, attached hereto and made a part hereof. No treatment of the produced water which is to be injected and disposed of into the Subject Well is presently proposed.

(6) The proposed stimulation program consists of perforating the "J" Sand (4,802-4,820') with 4 SPF, running tubing and setting a packer at approximately $\pm 4650'$. If necessary, the Subject Well will be acidized with 500 gallons of 15% HCL and completed as a water disposal well down tubing.

(7) It is estimated that a maximum of 3,000 BPD of produced water will be injected and disposed of in the Subject Well at pressures not to exceed 1,200 psi. This surface pressure will ensure that the calculated sandface fracturing pressures of approximately 3,370 psi will not be exceeded at the injection depth of 4,802'-4,820'. It is anticipated that initially, approximately 2,200 BPD will be injected and disposed of at an initial injection pressure of less than 100 psi.

(8) The names and addresses of all owners of record and all surface owners within one-quarter mile of the Subject Well are contained in Exhibit H attached hereto and made a part hereof. Applicant, as sworn to by the Affidavit of Service attached hereto as Exhibit I and made a part hereof, has given notice to all such described owners by personal delivery of a true copy of this Application, together with a copy of the letter contained in the form attached hereto as Exhibit J and made a part hereof. The Application describes the proposed conversion and disposal by injection operation, and the notice letter states that a public hearing on the authorization of the proposed operation may be required

upon the request of any adversely affected or aggrieved person by filing a written request for hearing within 15 days after service of such notice. The notice letter further states that additional information regarding the proposed operation may be obtained through the Office of the Commission.

6. Applicant believes and therefore states, that the injection/disposal operations contemplated by this Application will not result in the presence in any underground source of drinking water of any physical, chemical, biological or radiological substance or matter which may cause a violation of any primary drinking water regulation in effect on or after July 2, 1982 and codified at 40 CFR, Part 142, as amended, nor will such operations otherwise adversely affect the health of persons.

7. Applicant believes that the granting of this Application is necessary for the prevention of waste, the protection of correlative rights, to assure the orderly development of the common source of supply from the said "O" Sand and to avoid the drilling of unnecessary wells.

WHEREFORE, Applicant respectfully requests that this matter be set for hearing only if administrative approval cannot be given in lieu of hearing; that any notice be given as required by law; and that the Commission grant the orders and relief requested herein together with any other provisions which the Commission deems necessary or desirable in this Cause.

Respectfully submitted,

ATLANTIC RICHFIELD COMPANY

By Russell S. Jones
Russell S. Jones
Regis. No. 2513
Attorney for Applicant
30045 ARCO Tower
707 17th Street
Denver, Colorado 80202
(303)293-1024

Applicant's Address:
Atlantic Richfield Company
P. O. Box 5540
Denver, Colorado 80217
Attn: L. B. Morse,
District Operations Manager
(303)293-7031

VERIFICATION

STATE OF COLORADO)
) ss.
CITY AND COUNTY OF DENVER)

L. B. Morse, Attorney in Fact for Atlantic Richfield Company, upon oath, deposes and says that he has read the foregoing Verified Application before the Oil and Gas Conservation Commission of the State of Colorado, and states that the matters contained therein are true to the best of his knowledge and belief.

L. B. Morse

Subscribed and sworn to before me this 26th day of February, 1985.

[SEAL]

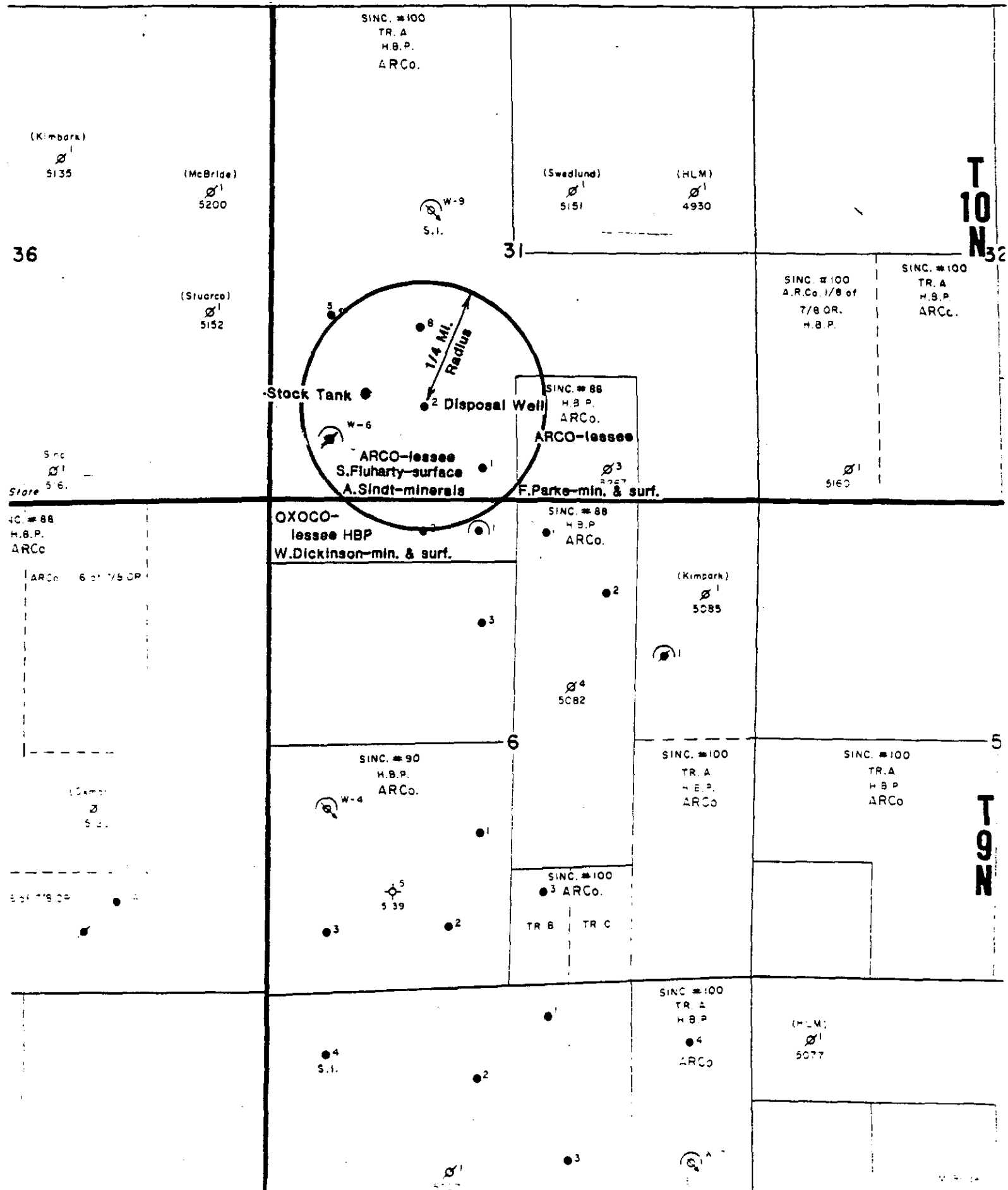
Carol K. Shreeve
Notary Public
P. O. Box 5540
Address
Denver, CO 80217

My Commission expires:

My Commission Expires June 28, 1987

R 53 W

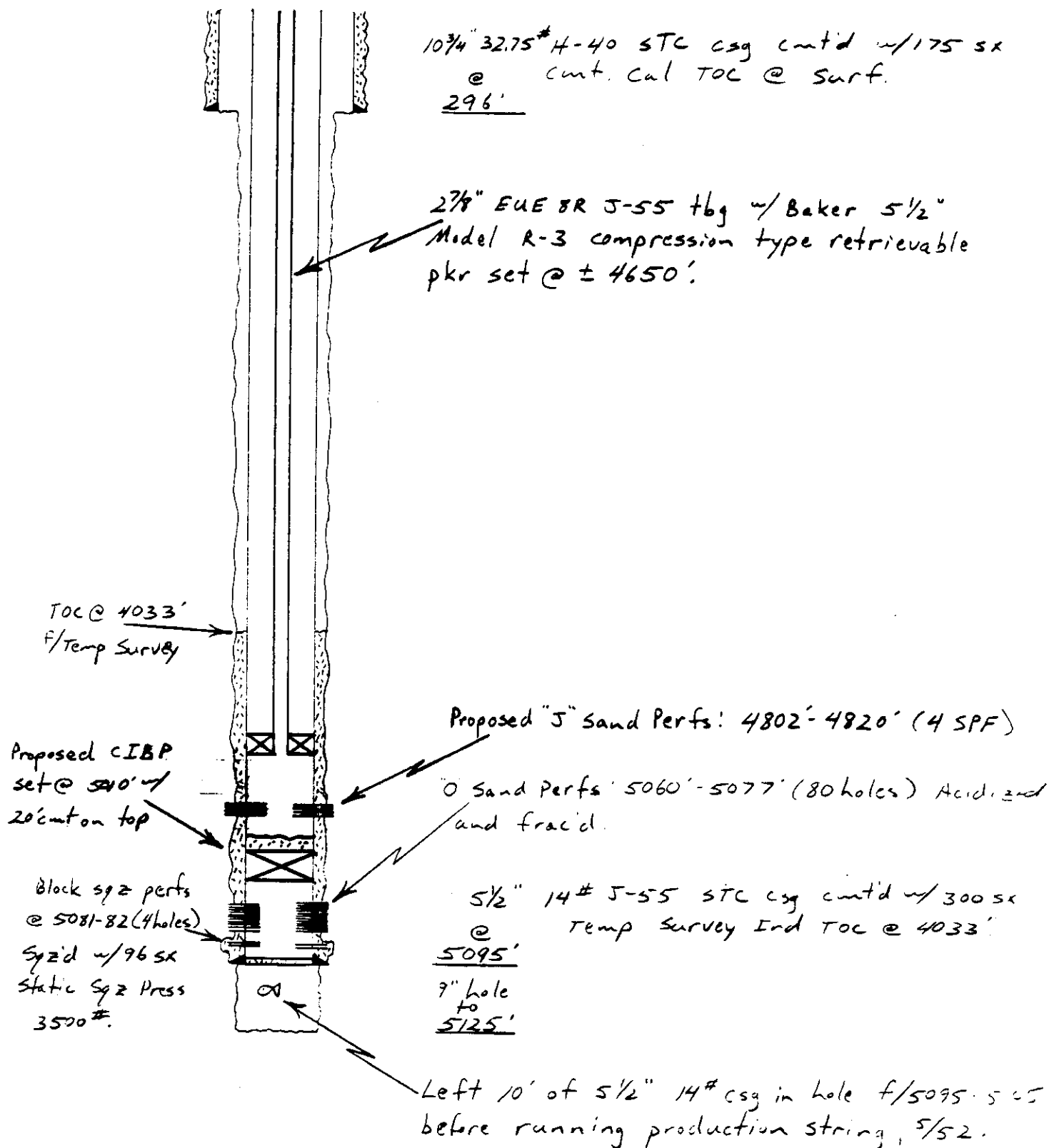
R 52 W



General Purpose Worksheet

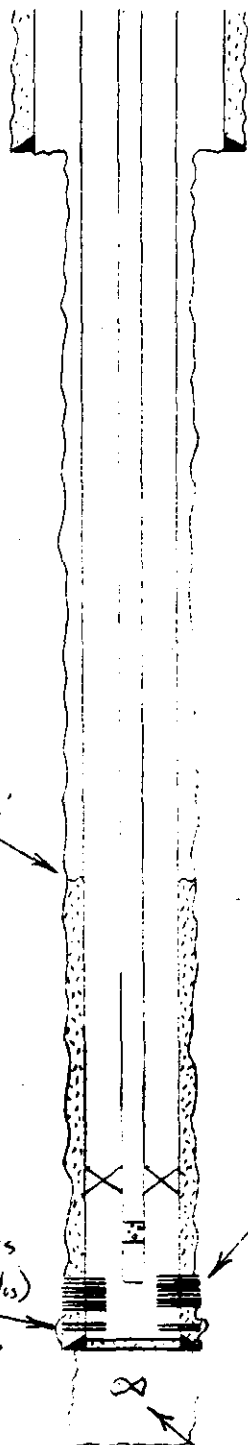
Page 1

Subject	Sindt #2		Page No.	01
File	Proposed Water Disposal Well Configuration	By	MBS	Date 2/12/85
Location: SE SW Sec 31 T-10-N R-52 W		TD: 5125' PBD: 5090'		
Logan County, Colorado		Drilled: Compl. 6/52		



General Purpose Worksheet

Subject	Sindt # 2 <u>Current Configuration</u>		Page No.	Of
File	Convert to water Disposal: Wellbore Diagram	By	MBS	Date 2/11/85
		TD:	5125	PBD: 5090
		Drilled & Compl.	6/52	



10 3/4" 32.75' H-40 STC csg cont'd w/ 175 sx
@
296'

2 3/8" 4.7 1/4' EUE 8R J-55 tbg (164' ts)
w/ 3' PN & 1 JS (31.70') open ended for
MA. Landed @ 5067.24. Baker Mod-1
B 5 1/2 x 2 3/8" TAC set @ 5036'

Press Tst'd 5 1/2" csg f/ surf - 4602
w/ 425# for 15 min 2/85. Made
bit & scraper run to approx 5035'

TAC @ 4033'
f/ Temp Survey

0" Sand Perfs: 5060'-5077' (80 holes) Acid. and
and fraud

Block Sqz perfs
@ 5081-82 (4.15)
sqzd w/ 96 sx.
Static Sqz Press
3500#.

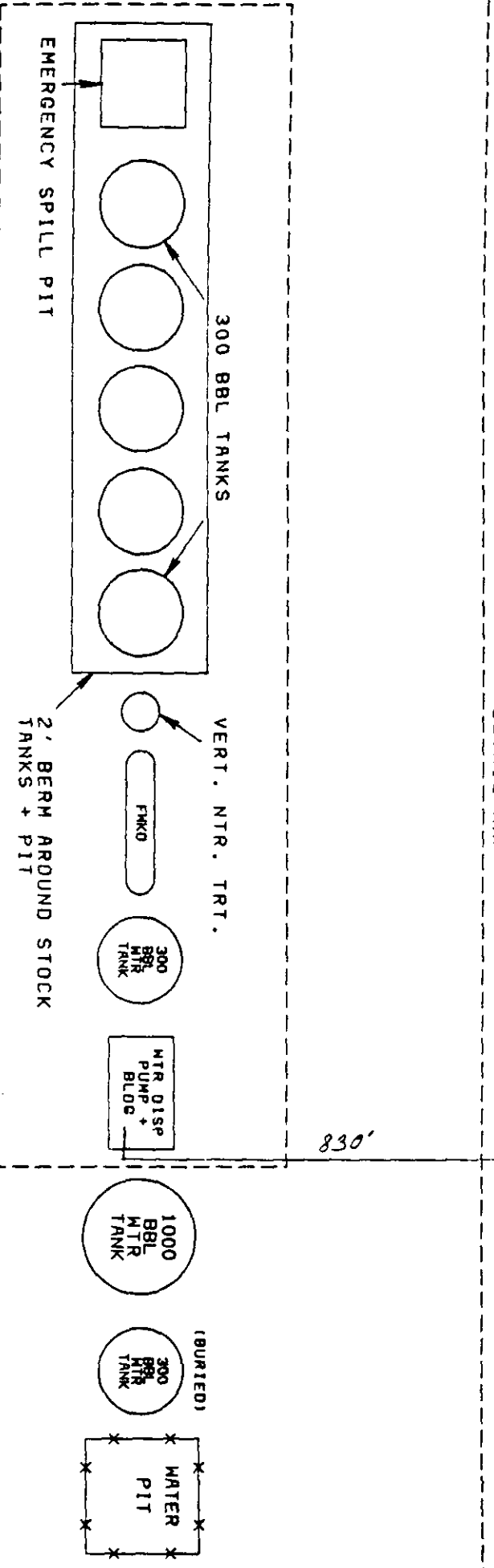
5 1/2" 14 1/4' J-55 STC csg cont'd w/ 300 sx
Temp Survey Ind. TAC @ 4033'
5095'
9" hole
5125'

Left 10' of 5 1/2" 14" csg in hole f/ 5095-5105
before running Production String 5/52.

DETAIL MAP

Sindt #2

DASHED LINES = 4 WIRE BARBED WIRE FENCE



SHEET 2 OF 4

ARCO Oil and Gas Company



Division of Atlantic Richfield Company
ROCKY MOUNTAIN DISTRICT
DENVER, COLORADO

WATER DISPOSAL SYSTEM
ARTHUR SINDT LEASE-BATTERY SITE
WEST PADRONI FIELD
SE/4 NW/4 SEC. 7, T 9 N R 52 W
LOGAN COUNTY, COLORADO

APPROVED BY _____ DATE _____
DRAFTED BY _____ CHECKED BY _____

SCHLUMBERGER WELL SURVEYING CORPORATION

HOUSTON, TEXAS



Electrical Log

COUNTY LOGAN
 FIELD or W. PADRONI
 LOCATION 31-10N-52W
 WELL SINDT # 2
 COMPANY SINCLAIR OIL & GAS

COMPANY SINCLAIR OIL &
GAS COMPANY

WELL SINDT # 2

FIELD WEST PADRONI

LOCATION 31-10N-52W

NW SE SW

COUNTY LOGAN

STATE COLORADO

Location of Well

E.S.
M.L.

Elevation: D.F. 4092

K.B.
or G.L. 4081

FILING No. _____

RUN No.	ONE				
Date	5-7-52				
First Reading	5070				
Last Reading	296				
Feet Measured	4774				
Csg. Schlum.	296				
Csg. Driller	270				
Depth Reached	5070				
Bottom Driller	5085				
Depth Datum	GL				
Mud Nat.	AQUAGEL				
" Density	10.1				
" Viscosity	98				
" Resist.	3.1 @ 70°F	@ °F	@ °F	@ °F	@ °F
" Res. BHT	1.6 @ 136°F	@ °F	@ °F	@ °F	@ °F
" pH	@ °F	@ °F	@ °F	@ °F	@ °F
" Wtr. Loss	CC 30 min.	CC 30 min.	CC 30 min.	CC 30 min.	CC 30 min.
Max. Temp. °F	136				
Bit Size	9"				
Spcgs.—AM	16"				
AO	15'8"				
Opr. Rig Time	2 HOURS				
Truck No.	754 SID				
Recorded By	JOHNSON				
Witness By	MACE				

PROD. WELL FILE

FOLD HERE

1/2" Sand

4674

(-593)

4700

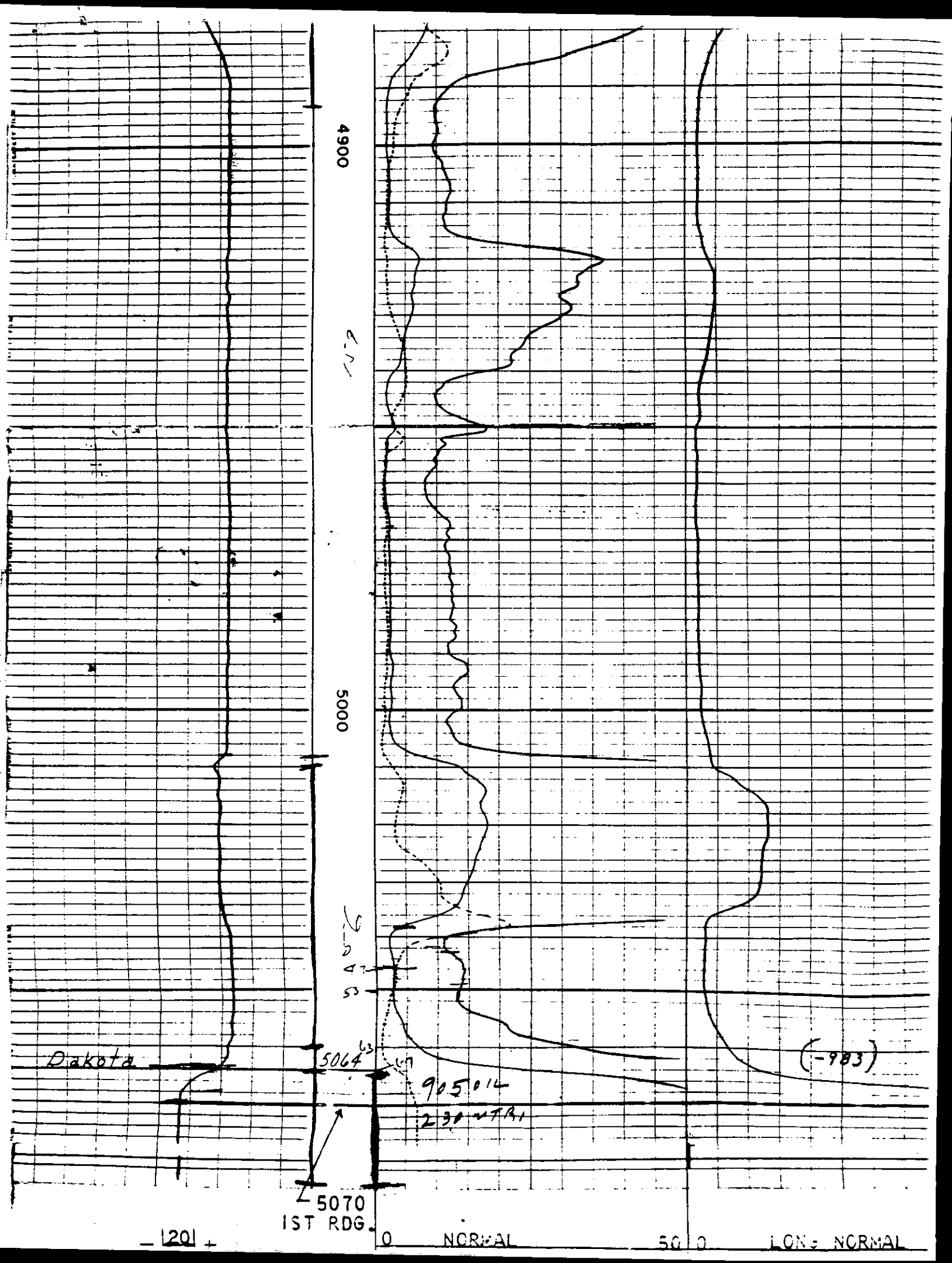
Muddy

4791

(-710)

4800

REL. 642' OG 41



Cable *gm*

TEMPERATURE AND WELL SERVICING CO.

LOCATION	COMPANY Sinclair Oil Company WELL Sandt # 2 FIELD Adroni COUNTY Logan STATE Colo. SEC. TWP. RGE. SURVEY	COMPANY WELL FIELD COUNTY STATE FILE
Type of Survey <i>Temperature</i> Log Measured From <i>Bottom Hole</i> Elevation Drilling Measured From <i>Ground level</i> Elevation Permanent Datum Elevation		
Date of Cementing <i>6/12/50</i> Time <i>1:00 P.M.</i> Date of Survey <i>6/12/50</i> Time Amount of Cement <i>300 lbs.</i> Type Amount of Admix. Type		
Casing Size	Casing Depth	Diam of Hole
5 1/2" from to	from to	from to
from to	from to	from to
Survey Begins at <i>3255'</i> Ft. Ends at <i>5065'</i> Ft. Approx. Fill-up Max. Temp. <i>189 deg.</i> Ft. Run No. <i>1</i> Approx. Top Cement Ft. Recorded by <i>A. Barker</i> Witnessed by		

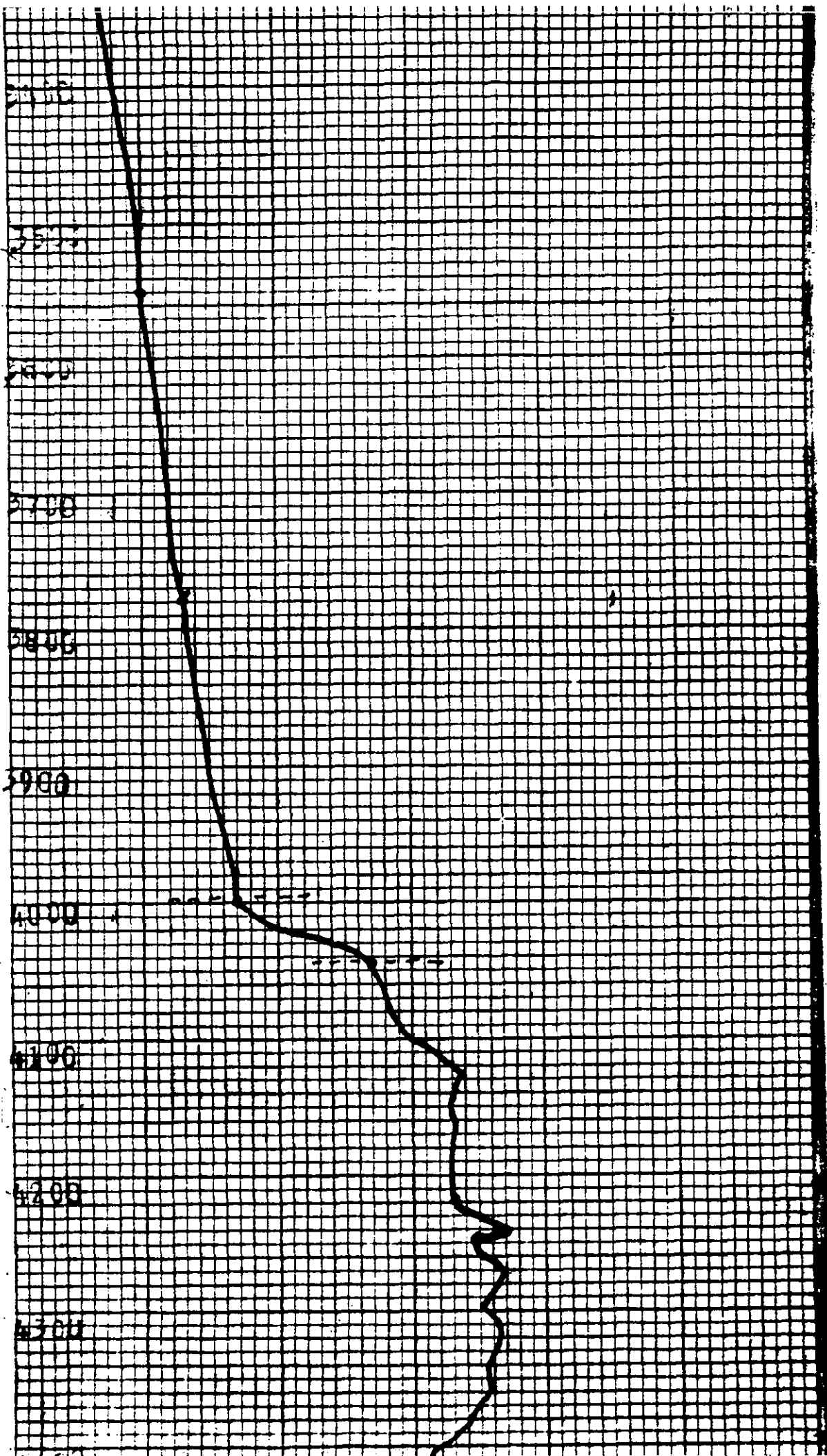


Exhibit "E"

Procedure to Convert Sindt #2 to Water Disposal

- 1) RUPU & POH laying down production equipment.
- 2) Wireline set a 5-1/2" CIBP @ 5010' & dump 20' cmt on top to P & A "O" Sand perfs f/5060'-5077' as per recommendation from Frank Piro of the Colorado Oil and Gas Conservation Commission.
- 3) Perforate the "J" Sand w/4 JSPF f/4802'-4820'. Depths taken f/Lane Wells radioactivity log dated 6/17/52.
- 4) RIH w/5-1/2 Baker Model R-3 compression type retrievable pkr w/hydraulic hold downs on 2-7/8" EUE 8R J-55 tbg.
- 5) Set pkr @ \pm 4650'. Load annulus with trt't fresh water and press tst 5-1/2" x 2-3/8' annulus to 300#. RDMO.
- 6) Commence disposal operations.

SKELAIR RESEARCH LABORATORIES INC.

WATER ANALYSIS TULSA, OKLA.

SAMPLE NO. 8-3907 ANALYST MEY FORMATION (Dakota) "O" Sand
 DEPTH 5065-5085' DESCRIPTION 500 Arthur Sindt #2, Sec. 31-10N-52W
D.E.T. #2 COUNTY Logan STATE Colorado
 TAKEN _____ REC'D 5-12-52 ANALYSED 5-13-52

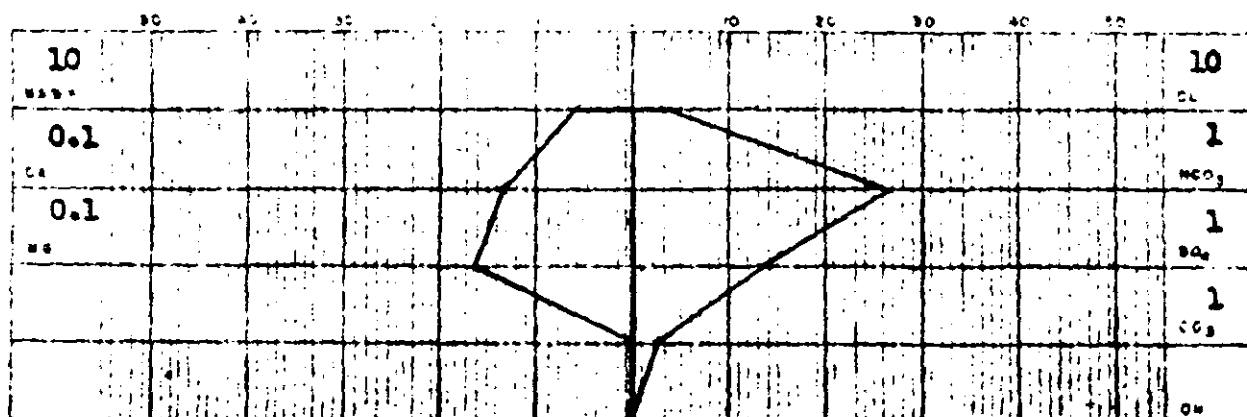
CONSTITUENTS IN PARTS PER MILLION			MEQ PER LITER	REACTING VALUES IN PERCENT
POTASSIUM (K)		ALKALIES POTASSIUM		
SODIUM (NA)	1,470	SODIUM	63.91	47.86
CALCIUM (CA)	26	ALKALINE EARTHS CALCIUM	1.30	0.97
MAGNESIUM (MG)	19	MAGNESIUM	1.56	1.17
CARBONATE (CO ₃)	53	WEAK ACID CARBONATE	1.76	1.33
BICARBONATE (HCO ₃)	1,601	BICARBONATE	26.24	19.65
SULFATE (SO ₄)	632	STRONG ACID SULFATE	13.16	9.85
CHLORIDE (CL)	908	CHLORIDE	25.61	19.17
H ₂ O				
SILICA (SiO ₂)				
TOTAL SOLIDS	4,709	SPECIFIC GRAVITY @ 60° F.	1.004	

PROPERTIES OF REACTION IN PERCENT				
PRIMARY SALINITY	58.0%	CHLORIDE SALINITY	66.06	pH 8.08 @ 22° C.
SECONDARY SALINITY		SULFATE SALINITY	33.94	RESISTIVITY 1,503 @ 70° F. OHM CM.
PRIMARY ALKALINITY	37.68			HAZ. EQ. 2,998 P.P.M.
SECONDARY ALKALINITY	4.20			

REMARKS Open two hours, recovered 905' blk. oil, 230' muddy water.

PATTERN WATER ANALYSIS SYSTEM

SCALE: MEQ. PER LITER



SAIR RESEARCH LABORATORIES INC

EXHIBIT "G"

WATER ANALYSIS TULSA, OKLA.

SAMPLE NO: 8-3906 ANALYST NET FORMATION Upper "J" Sand
 DEPTH 1007-1015' DESCRIPTION '800 Arthur Sinit #2, Sec. 31-10N-52W
D.S.T. #1 COUNTY Logan STATE Colorado
 TAKEN _____ REC'D 5-8-52 ANALYSED 5-13-52

CONSTITUENTS IN PARTS PER MILLION			MEQ PER LITER	REACTING VALUES IN PERCENT
POTASSIUM (K)		ALKALIES POTASSIUM		
SODIUM (NA)	2,684	SODIUM	116.71	49.46
CALCIUM (CA)	16	ALKALINE EARTHS CALCIUM	0.80	0.34
MAGNESIUM (MG)	6	MAGNESIUM	0.49	0.20
CARBONATE (CO ₃)		WEAK ACIDS CARBONATE		
BICARBONATE (HCO ₃)	2,269	BICARBONATE	37.19	15.76
SULFATE (SO ₄)	448	STRONG ACIDS SULFATE	9.33	3.95
CHLORIDE (CL)	2,535	CHLORIDE	71.49	30.29
SiO ₂				
SILICA (SiO ₂)				
TOTAL SOLIDS	7,958	SPECIFIC GRAVITY AT 15°C	1.007	

PROPERTIES OF REACTION IN PERCENT				
PRIMARY SALINITY	68.48	CHLORIDE SALINITY	88.46	pH 8.20 @ 22° C.
SECONDARY SALINITY		SULFATE SALINITY	11.54	RESISTIVITY 0.916 @ 72° F. OHM-CENTIMETERS
PRIMARY ALKALITY	30.44			MEQ/L 5,997 PPM
SECONDARY ALKALITY	1.08			

REMARKS Open one hour, recovered 690' w.v.s. show oil.

PATTERN WATER ANALYSIS SYSTEM

SCALE MEQ PER LITER



EXHIBIT H TO VERIFIED APPLICATION

LIST OF OWNERS WITHIN 1/4 MILE OF SUBJECT WELL

Sindt #2 Well (proposed water disposal well)
Township 10 North, Range 52 West
Section 31: SE/4SW/4
Logan County, Colorado

I. Lessees and Mineral Owners

Art Sindt
820 Hawthorne Court
Sterling, Colorado 80751

Francis Parke
23029 County Road 37
Sterling, Colorado 80751

W. E. Dickinson, Jr.
10829 County Road 48
Sterling, Colorado 80751

Atlantic Richfield Company
P. O. Box 5540
Denver, Colorado 80217

Oxoco, Inc.
1380 Lawrence St, Suite 1104
Denver, Colorado 80204
Attn: Kevin Fowler

II. Surface Owners

Stanley Fluharty
18979 County Road 50
Sterling, Colorado 80751

Francis Parke
23029 County Road 37
Sterling, Colorado 80751

W. E. Dickinson, Jr.
10829 County Road 48
Sterling, Colorado 80751

III. Domestic and Irrigation Well Owners

Arthur and Ivey Sindt
Route 2
Sterling, Colorado 80751
(stock tank)

EXHIBIT I to VERIFIED APPLICATION

AFFIDAVIT OF SERVICE

Russell S. Jones, Attorney for Applicant, herein states that he served or caused to be served by hand delivery, with written receipts therefor, a true and complete copy of the foregoing Verified Application upon all of the owners of record and all surface owners of record within 1/4 mile of the Subject Well described in the Application, and that such owners and their addresses are set forth in Exhibit H of the Application. Dated this 20th day of February, 1985, at Denver, Colorado.

Russell S. Jones
Attorney for Applicant

Subscribed and sworn to before me this 20th day of February, 1985.

[SEAL]

My Commission expires:

My Commission Expires June 23, 1987

Janet K. Sturge
Notary Public
P.O. Box 5540
Address
Denver, CO 80217

Atlantic Richfield Company Legal
707 Seventeenth Street
Post Office Box 5540
Denver, Colorado 80217
Telephone 303 293 1024



Russell S. Jones
Senior Attorney

EXHIBIT J TO VERIFIED APPLICATION

HAND DELIVERED

February 20, 1985

Re: Application of Atlantic Richfield
Company to the Colorado Oil and Gas
Conservation Commission for an Order
Approving the Conversion of the
Sindt #2 Well to a Water Disposal Well;
SE/4SW/4 Section 31, T10N, R52W
West Padroni Field,
Logan County, Colorado

Dear Owner:

Atlantic Richfield Company proposes to convert the present marginal oil well, Sindt #2, as described above, to a produced water disposal well, as more fully described in the Verified Application enclosed, and has filed the Application with the Oil and Gas Conservation Commission of the State of Colorado.

The records indicate that you are either an owner of minerals, an oil and gas lease, the surface, or a domestic/irrigation well within 1/4 mile of the above-described well.

Atlantic Richfield Company, in the absence of any objection, desires to obtain administrative approval of such Application without the necessity of a hearing before the Commission. Should you approve of and consent to the proposed well conversion and disposal by injection operations, please sign and date one copy of this letter, return it to the undersigned, and keep the second copy for your records. If you desire further information regarding the proposed operation, you may contact the Commission at the address and telephone indicated in the next paragraph.

If you feel that you are adversely affected by and have objections to the Application you must file a written statement of objections with and request a public hearing by the Commission, Suite 380, 1580 Logan Street, Denver, Colorado 80203

February 20, 1985
Page Two

[(303)866-3531] within 15 days after this notice letter has been mailed or delivered to you. If the Commission finds a significant degree of public interest in the proposed operation, it may order that a public hearing be held.

If you have questions or would like further information regarding the proposed operation, please do not hesitate to contact me at the address and phone indicated at the top of this letter.

Very truly yours,



Russell S. Jones

RSJ/js

Enclosures

CONSENT AND APPROVAL

_____, by the authorized signature below, hereby consents to and approves of the proposed operations as set forth in the Verified Application described herein, a copy of which the undersigned has received with this letter, and which the undersigned has read and fully understands.

DATED this ____ day of February, 1985.

By _____