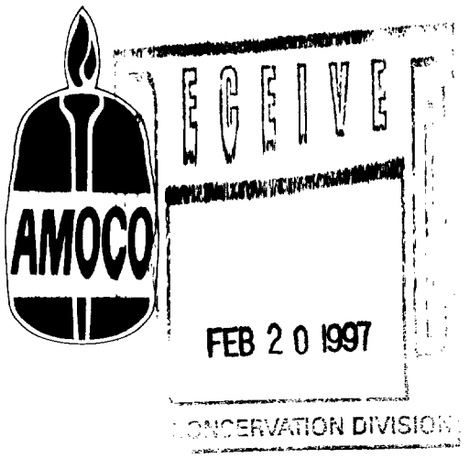
PC N/R



Amoco Production Company

501 WestLake Park Boulevard
Post Office Box 3092
Houston, Texas 77253-3092

February 17, 1997

SHUGART YATES SR QN GRBG

Bureau of Land Management
Roswell District Office
2909 West 2nd Street
Roswell, NM 88201

Application for Surface Commingling
Off Lease Storage and Measurement Approval
PMS 8 Federal Lease
Shugart, North-Bone Spring Pool
Loco Hills Pool
Eddy County, New Mexico

Gentlemen,

Amoco Production Company, as operator of the subject lease, requests administrative approval for surface commingling and off-lease storage and measurement of hydrocarbon production from the attached list of formations and wells.

The proposed operation is described in detail on the attached diagrams.

A map is enclosed showing the lease numbers and location of all leases and wells that will contribute production to the proposed commingling/common storage facility. All unitized/ communitized areas, producing zones/pools are also clearly illustrated.

A schematic diagram is also attached which clearly identifies all equipment that will be utilized.

The storage and measuring facility is located in Sec 8, T-18-S, R-31-E, Lease No. - unknown, Eddy County, New Mexico. The BLM will be notified if there is any future change in the facility location.

Details of the proposed method for allocating production to contributing sources is as follows:

> Amoco shall use well tests as a means of allocating production. Royalty interest owners are the same for both formations.

We have mailed a complete copy of this application to all royalty and working interest owners for both of these leases. Additionally, we have forwarded a separate copy of this application to the NMOCD in Santa Fe for their review.

RSOMS/CAC

YATES

CHALK HILL FTP

The proposed commingling of production is in the interest of conservation and will not result in reduced royalty or improper measurement of production. The API Gravity for the oil in the Bone Spring Pool is 35.94 and the gravity for the Loco Hills Pool is 34.68.

The proposed commingling is necessary for continued operation of the referenced Federal leases.

We understand that the requested approval will not constitute the granting of any right-of-way or construction rights not granted by the lease instrument. And, we will submit within 30 days an application for right-of-way approval to the BLM's Realty Section in your office if we have not already done so.

We also understand that additional wells require additional commingling approvals.

If supplemental information is required, contact me in Houston at (281) 366-7337.

Sincerely,

Tom G. Tullos
Sr. Business Analyst
Permian Basin Business Unit

Attachments

CC: New Mexico Oil Conservation Division
Attn: David Catnek
2040 South Pacheco
Santa Fe, NM 87505

MARK STEVENS
366 7335

LINDA
366-2170

Surface Commingling Application
Information Sheet
Amoco Production Company - OGRID 000778

PMS 8 Federal Well No. 5
Location - Letter D, 835 FNL x 710 FWL, Section 8, T-18-S, R-31-E, Eddy, NM
API No. - 30-015-26765
Production - 12 BOPD - 98 MCFD Gas
Shugart, North-Bone Spring Pool
Bone Spring Formation

PMS 8 Federal Well No. 6
Location - Letter F, 1930 FNL x 2032 FWL, Section 8, T-18-S, R-31-E, Eddy, NM
API No. - 30-015-26766
Production - 19 BOPD - 90 MCFD Gas
Shugart, North-Bone Spring Pool
Bone Spring Formation

PMS 8 Federal Well No. 7
Location - Letter B, 660 FNL x 1980 FEL, Section 8, T-18-S, R-31-E, Eddy, NM
API No. - 30-015-26767
Production - 8 BOPD - 10 MCFD Gas
Loco Hills Pool
Loco Hills Formation

PMS 8 Federal Well No. 8
Location - Letter H, 1980 FNL x 510 FEL, Section 8, T-18-S, R-31-E, Eddy, NM
API No. - 30-015-26957
Production - 21 BOPD - 23 MCFD Gas
Shugart, North-Bone Spring Pool
Bone Spring Formation

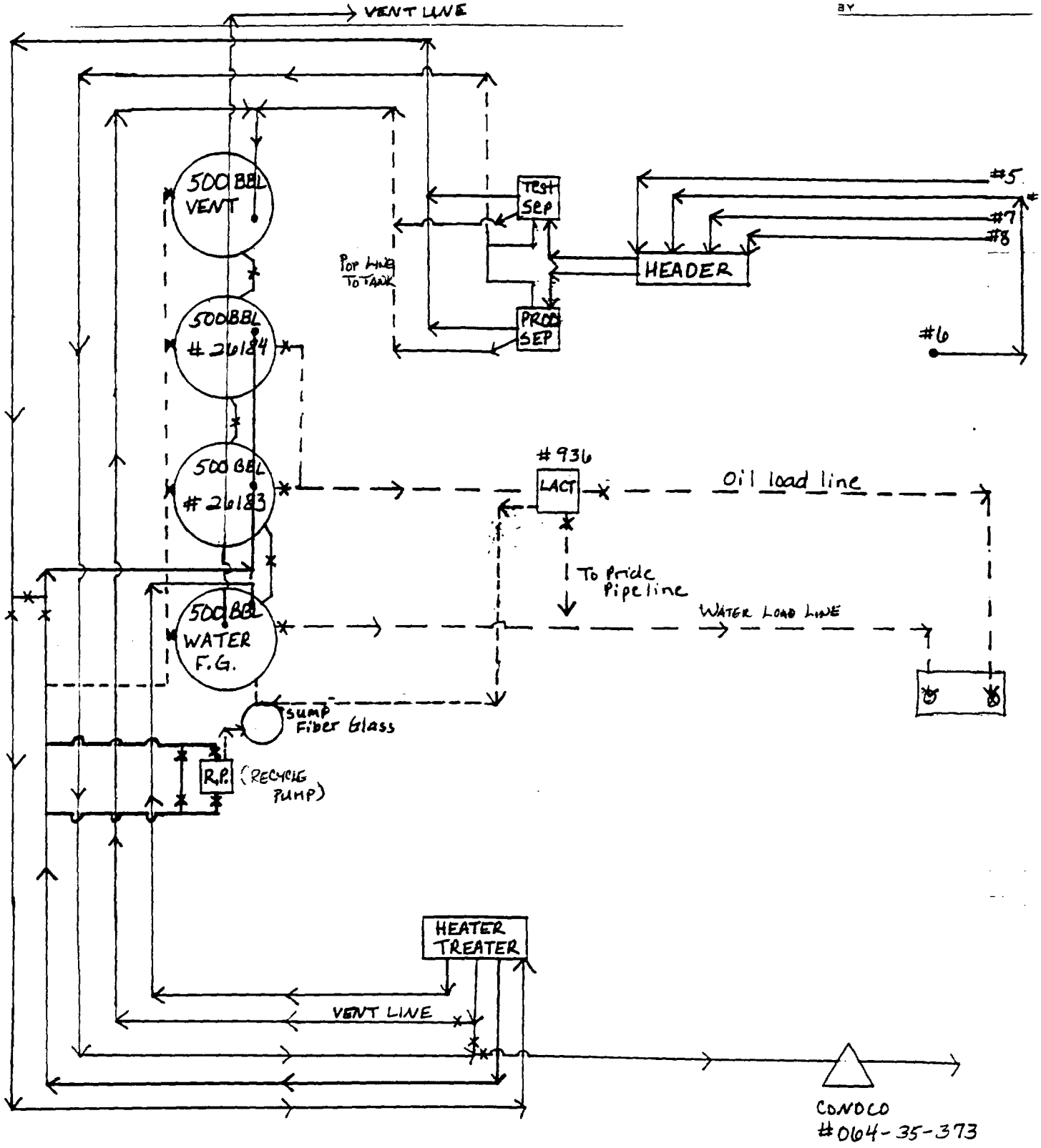
5405

SHEET NO OF

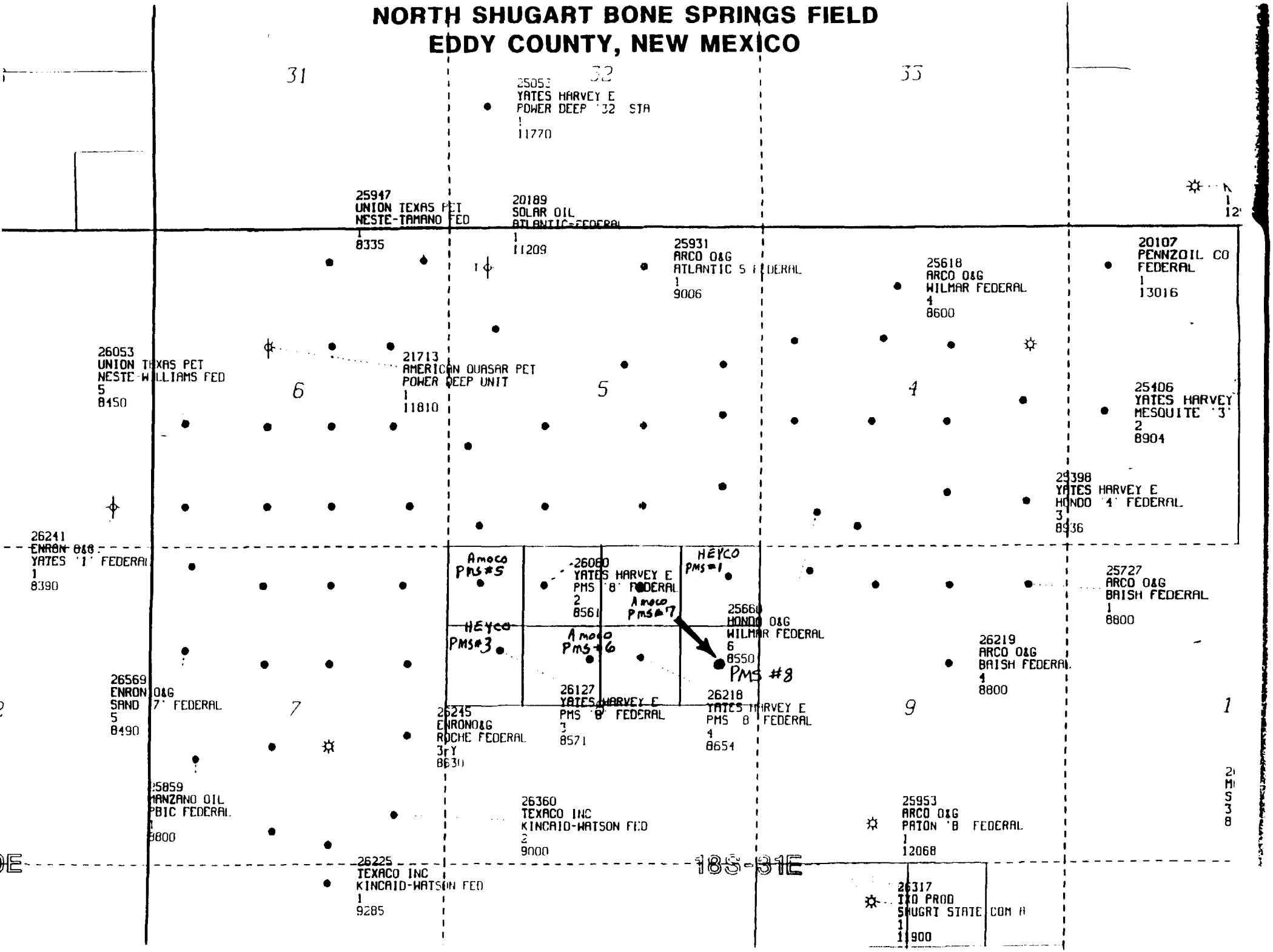
Amoco Production Company

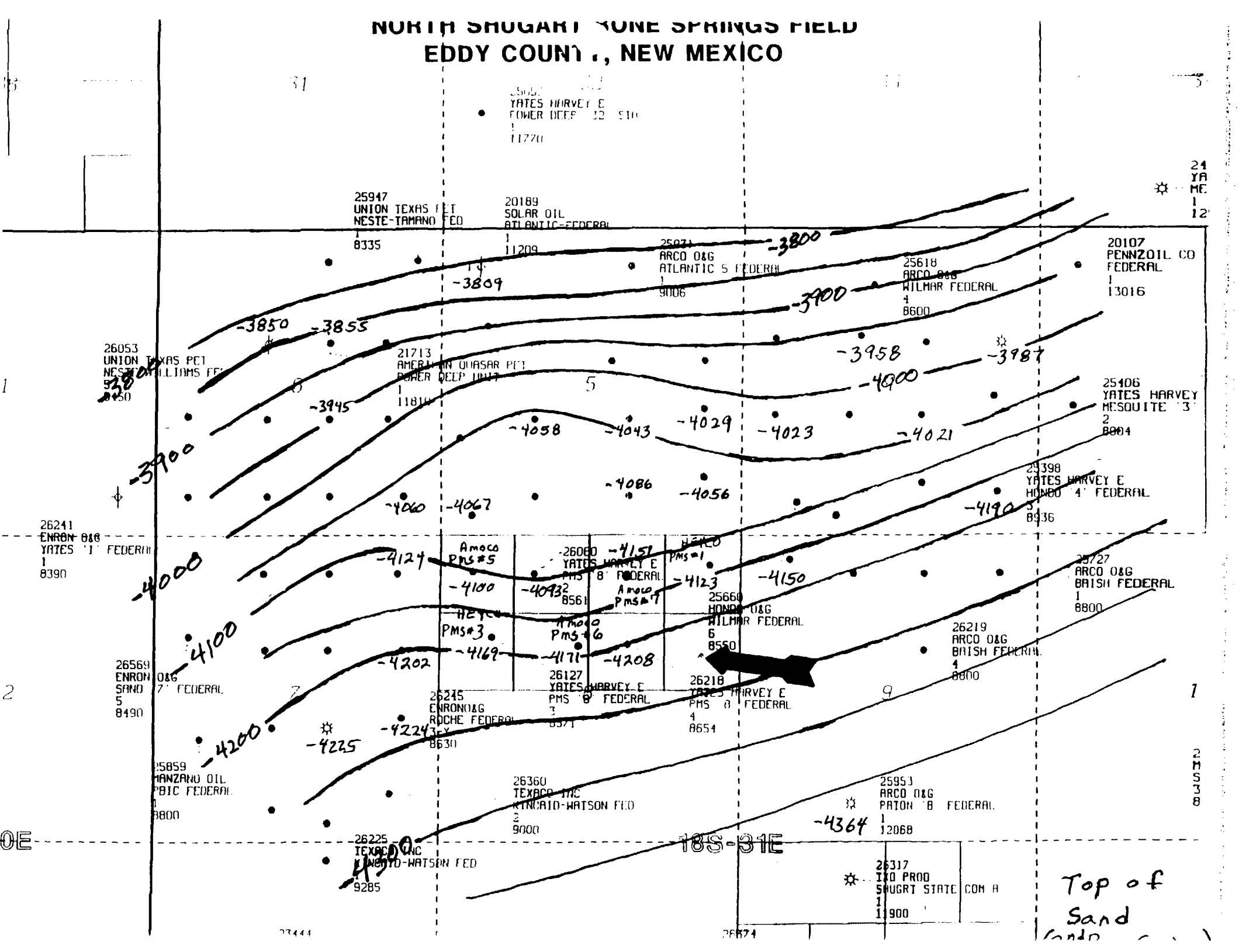
ENGINEERING CHART

SUBJECT PMS 8 Federal Central Tank Battery

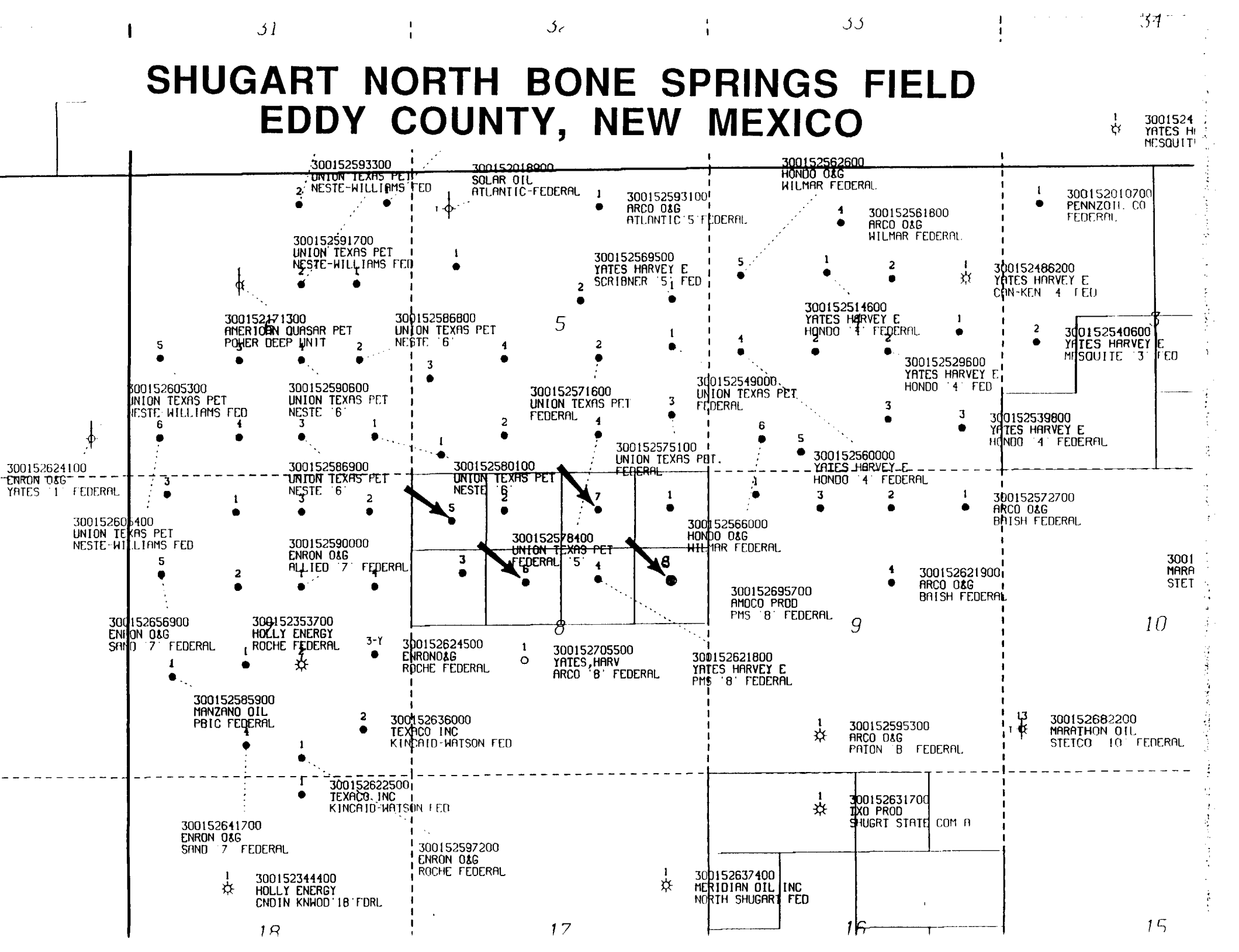


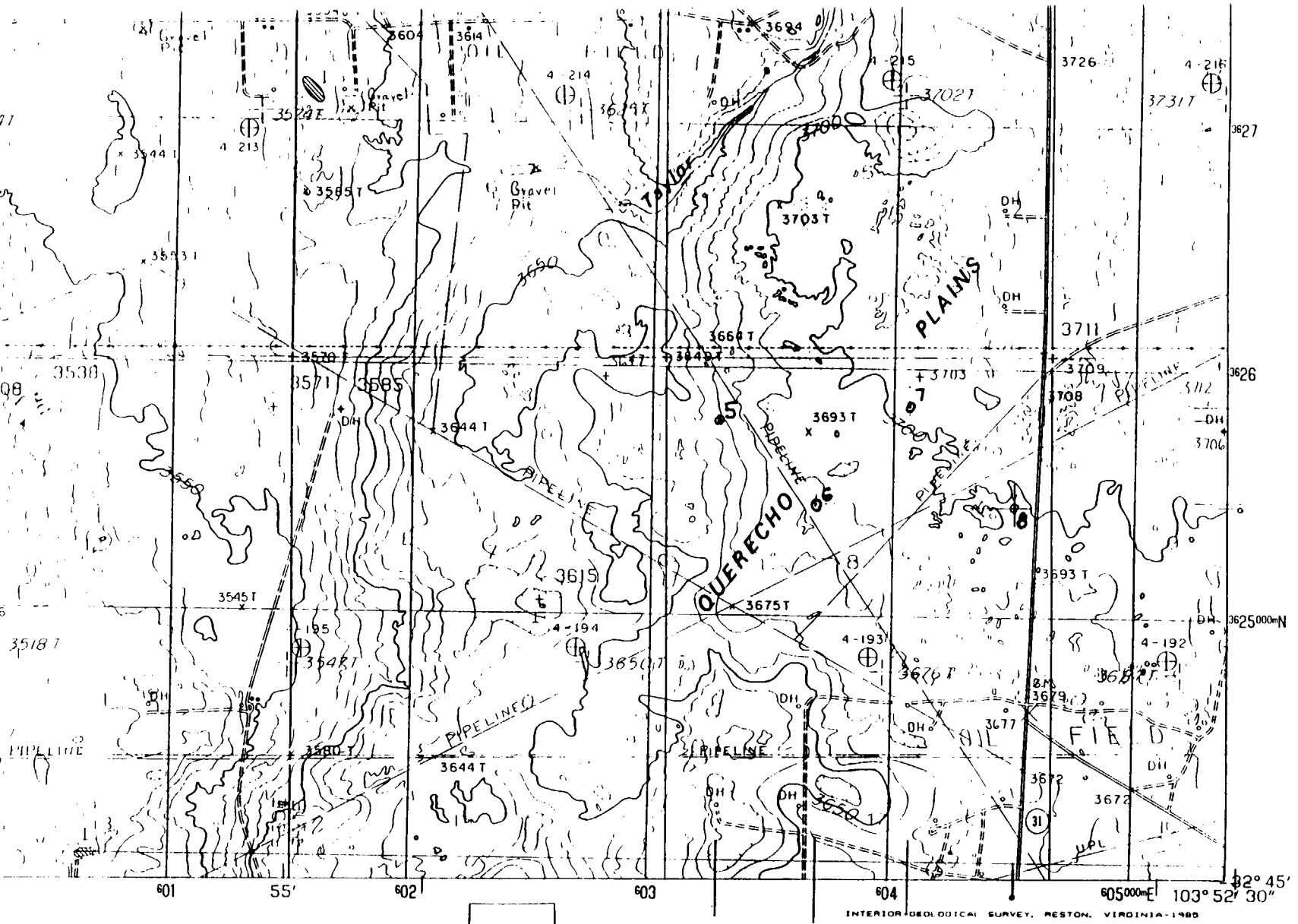
NORTH SHUGART BONE SPRINGS FIELD
EDDY COUNTY, NEW MEXICO



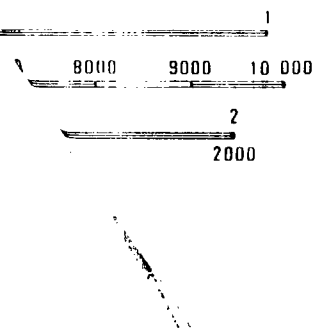

NORTH SHUGART BONE SPRINGS FIELD
EDDY COUNTY, NEW MEXICO
YATES HARVEY E
POWER DEEP 32 STA
1
11770
25947
UNION TEXAS PET
NESTE-TAMANO FED
1
8335
20189
SOLAR OIL
ATLANTIC-FEDERAL
1
11209
25971
ARCO O&G
ATLANTIC 5 FEDERAL
1
9006
25618
ARCO O&G
WILMAR FEDERAL
4
8600
20107
PENNZOIL CO
FEDERAL
1
13016
26053
UNION TEXAS PET
NESTE-WILLIAMS FED
1
8450
21713
AMERICAN QUASAR PET
POWER DEEP UNIT
1
11810
25406
YATES HARVEY
MESQUITE 3
2
8804
25398
YATES HARVEY E
HONDO 4 FEDERAL
3
8936
26241
ENRON O&G
YATES 1 FEDERAL
1
8390
26080
YATES HARVEY E
PMS 8 FEDERAL
8561
25660
HONDO O&G
WILMAR FEDERAL
6
8550
25727
ARCO O&G
BAISH FEDERAL
1
8800
26569
ENRON O&G
SAND 7 FEDERAL
5
8490
26127
YATES HARVEY E
PMS 8 FEDERAL
3
8571
26218
YATES HARVEY E
PMS 8 FEDERAL
4
8654
26219
ARCO O&G
BAISH FEDERAL
4
8800
26245
ENRON O&G
ROCHE FEDERAL
8630
25859
MANZANO OIL
PUBLIC FEDERAL
1
8800
26360
TEXACO INC
KINCAID-WATSON FED
2
9000
25953
ARCO O&G
PATON B FEDERAL
1
12068
26225
TEXACO INC
KINCAID-WATSON FED
9285
26317
IXO PROD
SHUGRT STATE COM A
1
11900
18S-31E
-3800
-3809
-3850
-3855
-3900
-3945
-3958
-3987
-4000
-4029
-4023
-4021
-4043
-4058
-4086
-4056
-4060
-4067
-4100
-4124
-4123
-4150
-4190
-4151
-4169
-4171
-4202
-4208
-4200
-4225
-4224
-4300
-4364
Amoco PMS #5
Amoco PMS #7
Amoco PMS #3
Amoco PMS #6
Top of Sand

SHUGART NORTH BONE SPRINGS FIELD
EDDY COUNTY, NEW MEXICO





INTERIOR-GEOLOGICAL SURVEY, RESTON, VIRGINIA-1985



QUADRANGLE LOCATION

1	2	3	1 Basin Well 2 Henshaw Tank 3 Maljamar NE 4 Red Lake SE 5 Maljamar 6 Illinois Camp NE 7 Hackberry Lake 8 Greenwood Lake
4		5	
6	7	8	

ROAD LEGEND

Improved Road . . . . . =====

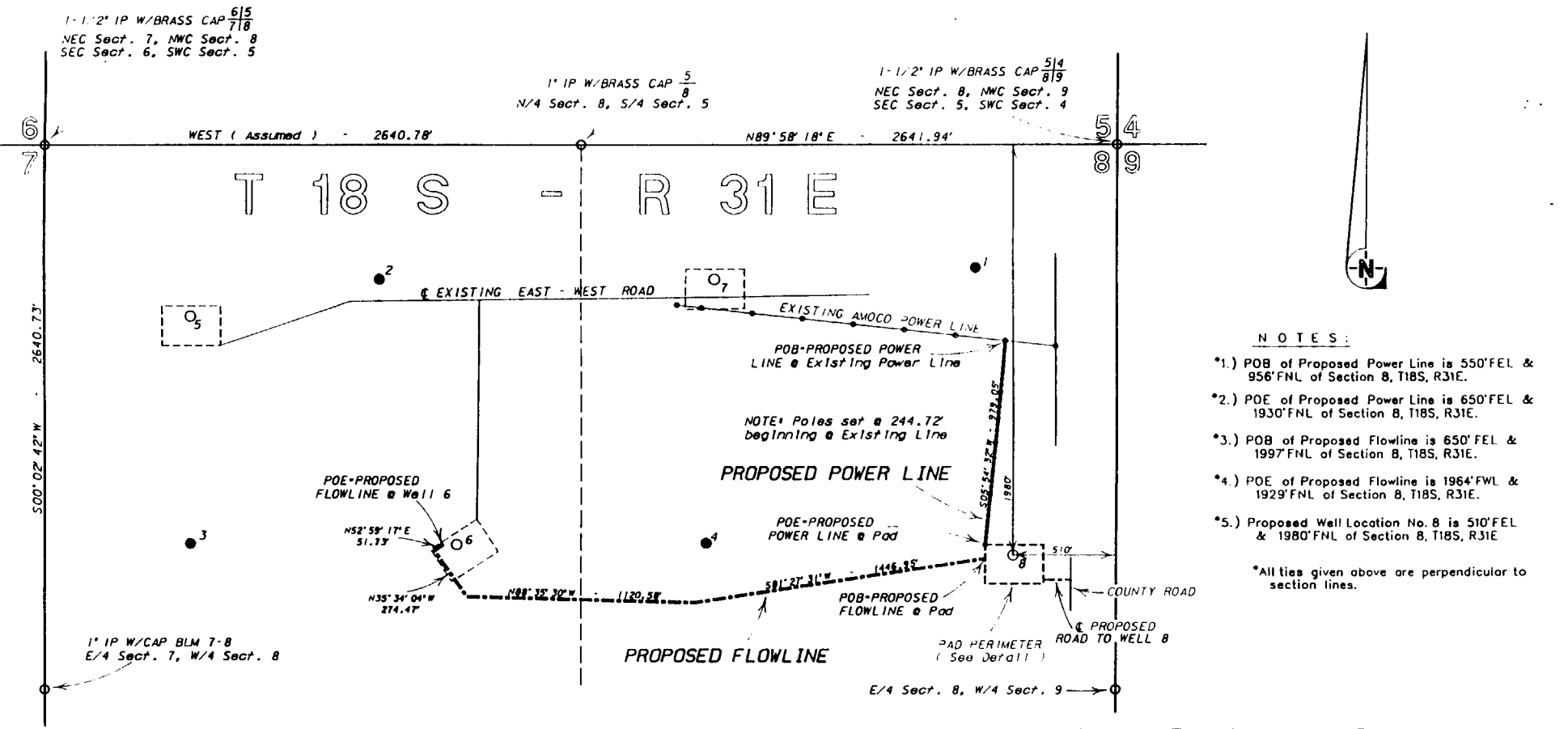
Unimproved Road . . . . . ------

Trail . . . . . - - -

◯ Interstate Route ⟨ ⟩ U.S. Route ◯ State Route

LOCO HILLS, NEW MEXICO

PROVISIONAL EDITION 1985



NOTES:

*1.) POB of Proposed Power Line is 550'FEL & 956'FNL of Section 8, T18S, R31E.

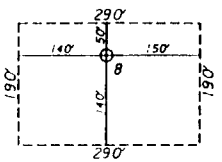
*2.) POE of Proposed Power Line is 650'FEL & 1930'FNL of Section 8, T18S, R31E.

*3.) POB of Proposed Flowline is 650' FEL & 1997'FNL of Section 8, T18S, R31E.

*4.) POE of Proposed Flowline is 1964'FWL & 1929'FNL of Section 8, T18S, R31E.

*5.) Proposed Well Location No. 8 is 510'FEL & 1980'FNL of Section 8, T18S, R31E

*All ties given above are perpendicular to section lines.



WELL 8 PAD

PAD DETAIL

Scale: 1" = 200'

Larry A. Fisher
Registered Professional Land Surveyor
Certificate No. 11013
Date Surveyed: 12/17/91

REGISTERED PROFESSIONAL SURVEYOR
No. 11013
NEW MEXICO
LARRY A. FISHER

Amoco Production Company
Land Survey Department

PROPOSED LOCATION, PAD, POWER LINE & FLOWLINE PMS 8 FEDERAL LEASE WELL NO. 8

Section 8, T18S-R31E, NMPM
North Shugart Field
Eddy County, New Mexico

Laboratory Services, Inc.
1331 Tasker Drive
Hobbs, New Mexico 88240
Telephone: (505) 397-3713

FOR: Amoco Production Company
Attention: Mr. Dusty Weaver
1017 W. Stanolind Rd.
Hobbs, New Mexico 88240

SAMPLE IDENTIFICATION: PMS 8 Fed. #7
COMPANY: Amoco Production Co.
LEASE:
PLANT:

SAMPLE DATA:
DATE SAMPLED: 2/10/97
ANALYSIS DATE: 2/11/97
PRESSURE – PSIG 160
SAMPLE TEMP. °F 50
ATMOS. TEMP. °F

GAS (XX) LIQUID ( )
SAMPLED BY: Dusty Weaver
ANALYSIS BY: Vickie Walker

REMARKS: H2S = 5.08%

COMPONENT ANALYSIS

COMPONENT		MOL PERCENT	GPM
Hydrogen Sulfide	(H2S)	5.08	
Nitrogen	(N2)	10.47	
Carbon Dioxide	(CO2)	0.04	
Methane	(C1)	53.42	
Ethane	(C2)	13.26	3.537
Propane	(C3)	11.35	3.119
I-Butane	(IC4)	1.45	0.472
N-Butane	(NC4)	3.24	1.018
I-Pentane	(IC5)	0.81	0.295
N-Pentane	(NC5)	0.59	0.213
Hexane Plus	(C6+)	0.29	0.120
		100.00	8.774

MOLECULAR WT. 26.2250

BTU/CU.FT. – DRY	1315
AT 14.650 DRY	1311
AT 14.650 WET	1288
AT 14.73 DRY	1318
AT 14.73 WET	1295

SPECIFIC GRAVITY –
CALCULATED 0.906
MEASURED

Laboratory Services, Inc.
1331 Tasker Drive
Hobbs, New Mexico 88240
Telephone: (505) 397-3713

FOR: Amoco Production Company
Attention: Mr. Dusty Weaver
1017 W. Stanolind Rd.
Hobbs, New Mexico 88240

SAMPLE IDENTIFICATION: PMS 8 Fed.
COMPANY: Amoco Production co.
LEASE:
PLANT:

SAMPLE DATA:
DATE SAMPLED: 2/10/97
ANALYSIS DATE: 2/11/97
PRESSURE – PSIG 57
SAMPLE TEMP. °F 35
ATMOS. TEMP. °F

GAS (XX) LIQUID ( )
SAMPLED BY: Dusty Weaver
ANALYSIS BY: Vickie Walker

REMARKS: H2S = 0.226%

COMPONENT ANALYSIS

COMPONENT		MOL PERCENT	GPM
Hydrogen Sulfide	(H2S)	0.23	
Nitrogen	(N2)	2.42	
Carbon Dioxide	(CO2)	0.59	
Methane	(C1)	69.80	
Ethane	(C2)	15.17	4.048
Propane	(C3)	7.94	2.183
I-Butane	(IC4)	0.92	0.300
N-Butane	(NC4)	1.81	0.569
I-Pentane	(IC5)	0.44	0.161
N-Pentane	(NC5)	0.42	0.150
Hexane Plus	(C6+)	0.26	0.107
		100.00	7.518

BTU/CU.FT. – DRY	1310
AT 14.650 DRY	1306
AT 14.650 WET	1284
AT 14.73 DRY	1313
AT 14.73 WET	1291

MOLECULAR WT. 22.7050

SPECIFIC GRAVITY –
CALCULATED 0.784
MEASURED

PETROLITE

Inter-office Correspondence

To: G.L.White

From: J.C.Schwab

Subject:

CRUDE OIL ANALYSES
AMOCO PROD.
PMS #8 CRUDE OILS
HOBBS/DENVER CITY AREA
NORTH PERMIAN BASIN REGION
LAB SAMPLE 97-029

Date: January 23, 1997

Copy to: D.R.Ellis
K.W.Koch
M.D.Portfield
File

CRUDE OIL ANALYSIS AND RESULTS

As per your request, the following cloud point, paraffin content, asphaltene content, asphaltic resin content, volatile content, inorganic solids content, oily constituent content, pour point, and API Gravity analyses were completed on the Amoco Prod. PMS #8 crudes oil. The results of these tests are summarized in Table I.

1. **Oil Viscosity / Cloud Point:** A Haake RV-20 viscometer equipped with a programmable circulating bath was used to produce a viscosity versus temperature profile of the oil. Viscosity and temperature measurements were collected by computer every 10 seconds as the oil was cooled from 70 to 5°C under a 300 reciprocal seconds shear rate. When paraffin begins to cloud or precipitate from the oil a measurable viscosity increase will be evident in the oil's viscosity versus temperature trace. The paraffin that is no longer in solution causes the oil's viscosity to increase at a much faster rate which will be evident as an inflection point in the viscosity versus temperature trace. The resultant viscosity versus temperature graph is attached.

2. **Weight Percent Paraffin:** Gas chromatography (GC) was used to determine the oil's weight percent paraffins. The weight percent paraffin result includes only n-alkanes greater than or equal to $C_{20}H_{42}$. The oil's gas chromatogram results are attached.

3. **Weight Percent Asphaltenes:** A pentane extraction was used to identify the amount of asphaltenes in the crude oil. Approximately 2 grams of oil was added to 200 ml of pentane to precipitate the asphaltenes. The pentane/oil solution was then passed through a filter to collect the precipitated asphaltenes and undissolved inorganic solids. The weight percent asphaltenes plus inorganic solids are obtained by dividing the weighed amount of filtered material by the starting weight of oil added to the pentane. The weight percent asphaltenes are then obtained by correcting for the amount due to inorganic solids.

4. **Weight Percent Asphaltic Resins:** Asphaltic resins are extracted from the oil using Fuller's Earth. The resins are then removed from the Fuller's Earth using hot xylene. The resins alone are isolated by allowing the xylene to evaporate. The weight of the isolated asphaltic resins is divided by the starting weight of oil used in the analysis to give the oil's weight percent asphaltic resins.

5. **Weight Percent Volatiles:** Approximately 5 grams of oil are weighed out into a small dish and placed on a 250°F steam plate for 24 hours. The volatiles are recorded as the amount of oil that evaporated or volatilized during the 24 hour period at 250° F.

6. **Weight Percent Inorganic Solids:** A xylene extraction was used to identify the amount of inorganic solids in the oil.. Approximately 2 grams of oil was added to 200 ml of hot xylene in order to dissolve all of the organic components (i.e. paraffins, asphaltenes, resins, and oily constituents). The xylene/oil solution was then passed through a filter to collect the inorganic solids which remain insoluble in the hot xylene. The weight percent inorganic solids are obtained by dividing the weighed amount of filtered material by the starting weight of oil added to the xylene.

7. **Oily Constituents:** Oily constituents are defined as the portion of the oil that is neither asphaltenes, asphaltic resins, volatiles at 250°F, or paraffin above $C_{20}H_{42}$. The amount of oily constituents in an oil is determined by subtracting the weight percentages of the other components from 100 percent.

8. **Pour Points:** The pour points were determined using a modified version of the ASTM D-97 method. The ASTM D-97 maximum pour point was obtained by heating the oil to 115°F before cooling. The modified ASTM D-97 minimum pour point was obtained by heating the oil to 180°F before cooling. In each method the oil was cooled in a standard set of ASTM D-97 pour point freezers and checked every 5°F for solidification during the cooling process. The ASTM D-97 pour point result is defined as the temperature at which the oil first solidifies plus 5°F. For example, an oil solidifying at 30°F would have a reported 35°F ASTM D-97 pour point.

TABLE I
CRUDE OIL ANALYSES RESULTS
AMOCO PROD. PMS #8

ANALYSIS	RESULT	
Lab. Number	97-029-1	97-029-2
Well	Fed #6	Fed #7
Cloud Point (by viscometry)	108°F	108°F
Weight Percent Paraffin (by GC)*	2.61%	2.39%
Weight Percent Asphaltenes	0.21%	0.91%
Weight Percent Asphaltic Resins	3.14%	6.31%
Weight Percent Volatiles at 250°F	64.30%	53.43%
Weight Percent Oily Constituents	29.71%	36.92%
ASTM D-97 Maximum Pour Point (reheat to 115°F)	0°F	-20°F
Modified ASTM D-97 Minimum Pour Point (reheat to 180°F)	<-30°F	<-30°F

* Weight percent paraffin includes only n-alkanes (straight chain hydrocarbons) greater than or equal to $C_{20}H_{42}$.

If you have any questions, comments, or need for additional testing please give me a call at (314) 961-3500 Ext. 6498.

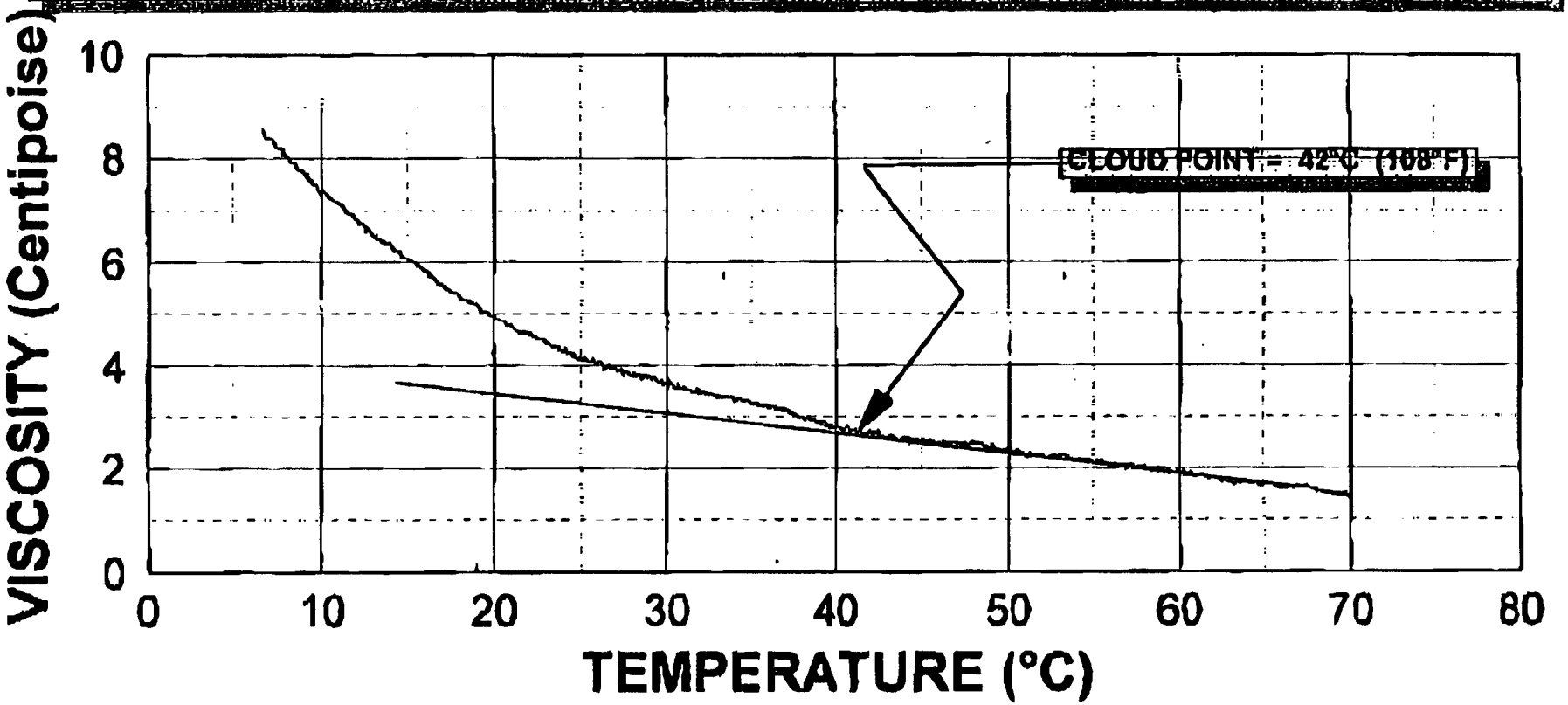
John C. Schwab

PETROLITE

TRETOLITE DIVISION

VISCOSITY VERSUS TEMPERATURE PROFILE

AMOCO PROD. PMS 8FED WELL #6 CRUDE OIL



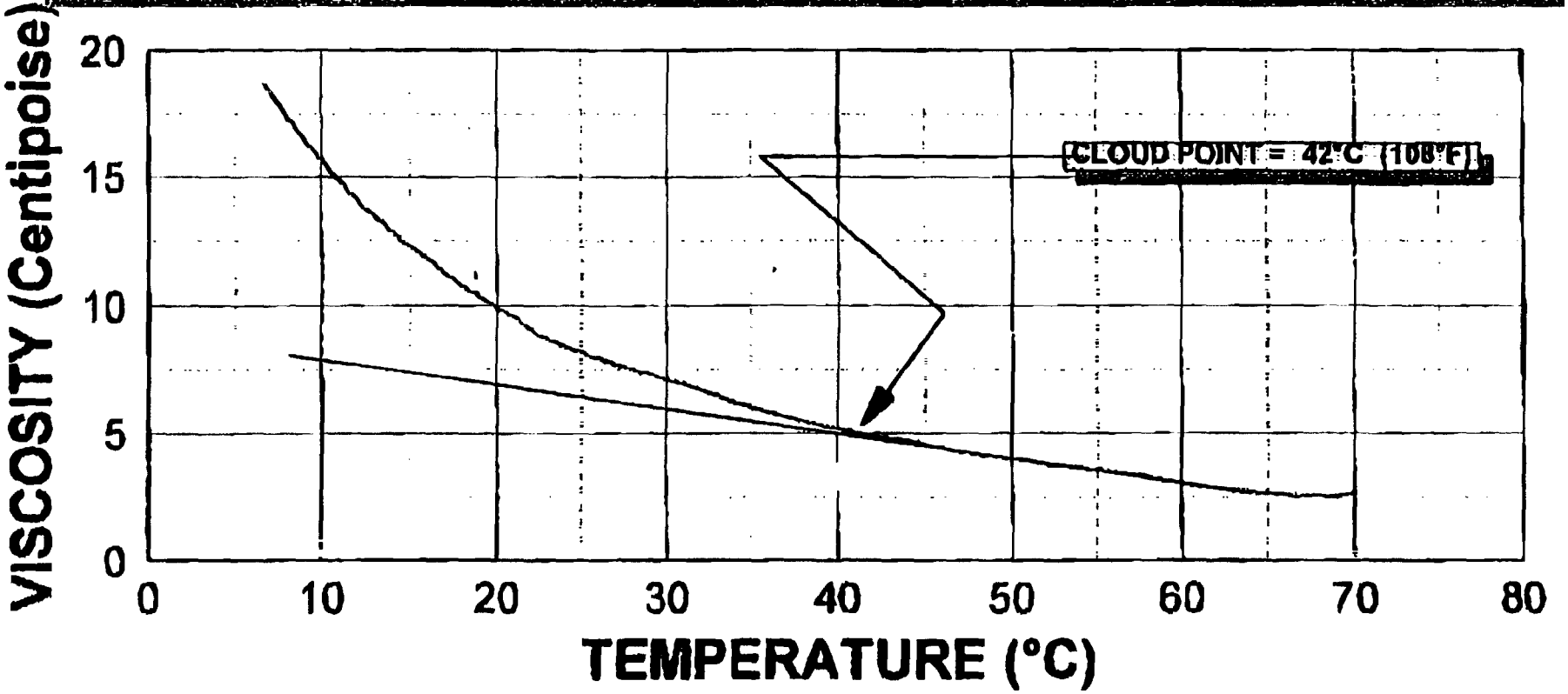
J. C. SCHWAB
JAN. 23, 1997
97-29-18

PETROLITE

TRETOLITE DIVISION

VISCOSITY VERSUS TEMPERATURE PROFILE

AMOCO PROD. PMS 8FED WELL #7 CRUDE OIL



J. C. SCHWAB
JAN. 23, 1997
97-029-2

Petrolite Analytical Paraffin Characterization

Sample: 97-029-1 AMOCO PMS #8 FED #6
Date: 1/22/97
File: JC50120A.xls

Result File: JC03A_316
Dilution Factor: 0.01592

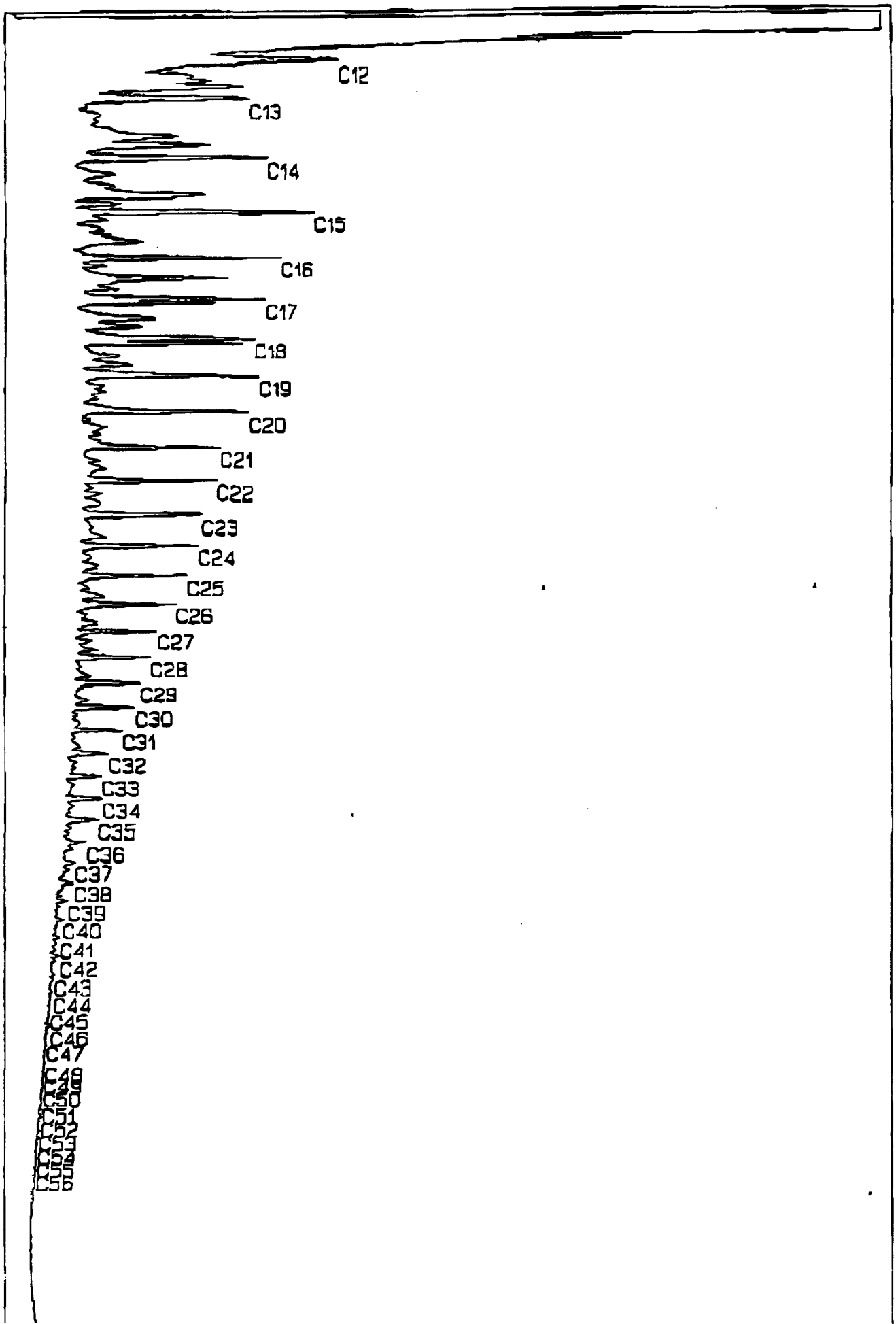
Peak Name	Calc. Response	RT	Area	Calc. Wt %
C12	6034	0.97	416888	0.434
C13	5997	1.78	424145	0.444
C14	5959	3.02	456047	0.481
C15	5921	4.15	481795	0.511
C16	5883	5.18	395643	0.422
C17	5846	6.14	389885	0.419
C18	5808	7.02	401614	0.434
C19	5770	7.85	420784	0.458
C20	5732	8.65	322463	0.353
C21	5695	9.41	243036	0.268
C22	5657	10.14	198693	0.221
C23	5619	10.83	183552	0.205
C24	5582	11.50	188278	0.212
C25	5544	12.15	150490	0.170
C26	5506	12.78	164058	0.187
C27	5468	13.38	116494	0.134
C28	5431	13.96	105783	0.122
C29	5393	14.52	86490	0.101
C30	5355	15.07	82079	0.096
C31	5317	15.59	66781	0.079
C32	5280	16.10	58253	0.069
C33	5242	16.59	55837	0.067
C34	5204	17.08	52947	0.064
C35	5166	17.55	60864	0.074
C36	5129	18.00	34204	0.042
C37	5091	18.45	18544	0.023
C38	5053	18.88	12388	0.015
C39	5015	19.29	15773	0.020
C40	4978	19.70	11938	0.015
C41	4940	20.10	6636	0.008
C42	4902	20.50	9160	0.012
C43	4864	20.88	10304	0.013
C44	4827	21.27	3287	0.004
C45	4789	21.61	6420	0.008
C46	4751	21.98	5854	0.008
C47	4713	22.30	2312	0.003
C48	4676	22.78	2292	0.003
C49	4638	23.01	1957	0.003
C50	4600	23.33	3639	0.005
C51	4562	23.67	1182	0.002
C52	4525	23.99	1138	0.002
C53	4487	24.28	474	0.001
C54	4449	24.59	799	0.001
C55	4411	24.89	1689	0.002
C56	4374	25.19	1137	0.002
	Totals:			6.22

Total Wt. % for C20+ Paraffins:	2.61

Result : JCD3A_316

Method : JCWAX1A

Sample : 97-029-1 AMOCO PMS #8 Injected : TUE JAN 21, 1997 5:05:55 PM
FEO #6



Petrolite Analytical Paraffin Characterization

Sample: 97-029-2 AMOCO PMS #8 FED #7

Date: 1/22/97

File: JC50120A.xls

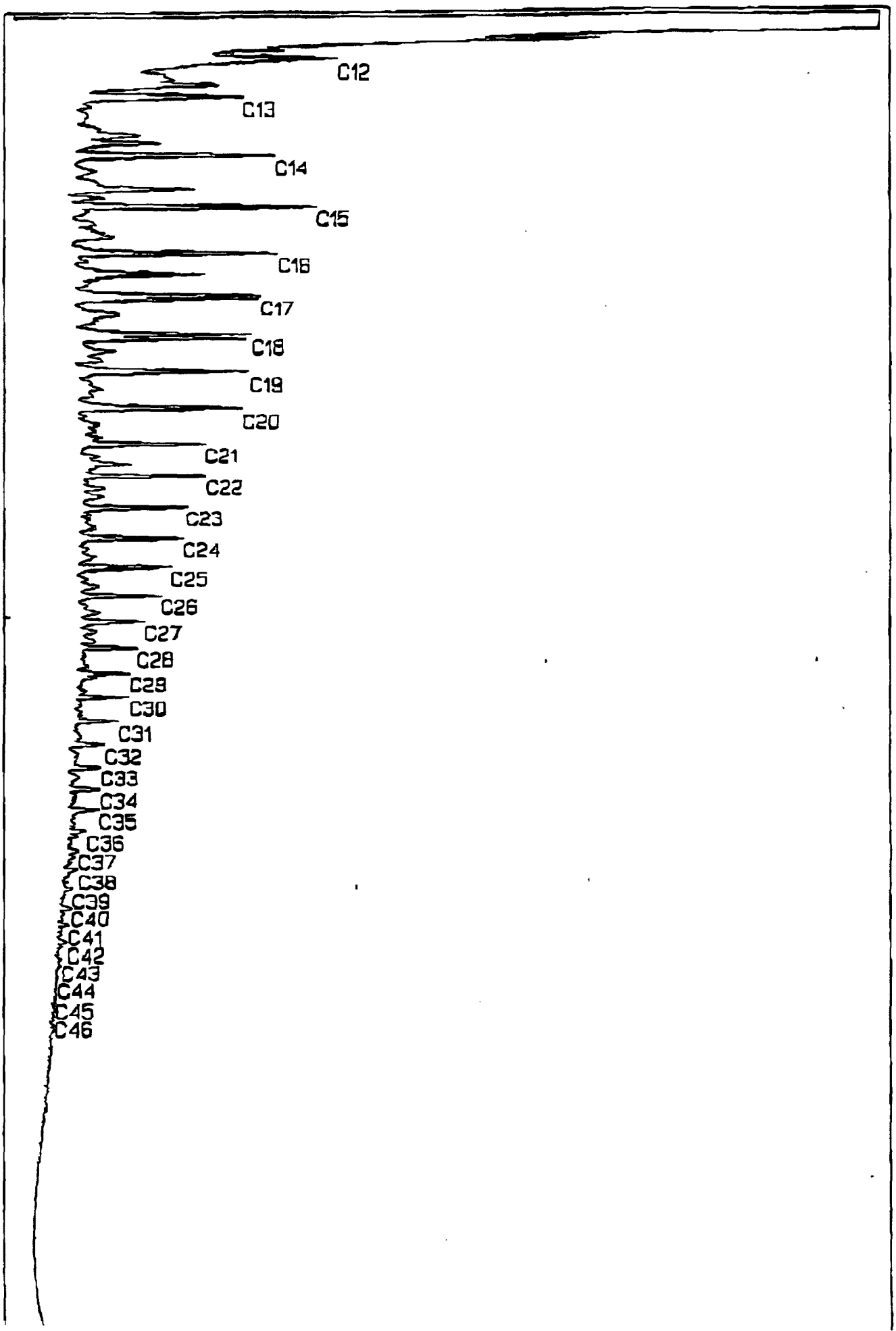
Result File: JC03A_312
Dilution Factor: 0.01517

Peak Name	Calc. Response	RT	Area	Calc. Wt. %
C12	6034	0.98	318262	0.348
C13	5997	1.80	435323	0.478
C14	5959	3.05	479138	0.530
C15	5921	4.18	463291	0.516
C16	5883	5.20	384372	0.431
C17	5846	6.16	384449	0.433
C18	5808	7.04	370477	0.420
C19	5770	7.87	380220	0.434
C20	5732	8.67	274357	0.315
C21	5695	9.43	231071	0.267
C22	5657	10.16	183417	0.214
C23	5619	10.86	161991	0.190
C24	5582	11.53	158658	0.187
C25	5544	12.18	155513	0.185
C26	5506	12.80	132649	0.159
C27	5468	13.40	91801	0.111
C28	5431	13.98	83114	0.101
C29	5393	14.54	63448	0.078
C30	5355	15.09	73385	0.090
C31	5317	15.62	57786	0.072
C32	5280	16.12	54972	0.069
C33	5242	16.62	49561	0.062
C34	5204	17.10	54650	0.069
C35	5166	17.57	39048	0.050
C36	5129	18.03	20174	0.026
C37	5091	18.47	18309	0.024
C38	5053	18.91	24801	0.032
C39	5015	19.32	9804	0.013
C40	4978	19.74	12160	0.016
C41	4940	20.14	10445	0.014
C42	4902	20.53	11638	0.016
C43	4864	20.91	8071	0.011
C44	4827	21.29	5095	0.007
C45	4789	21.72	3562	0.005
C46	4751	22.13	5303	0.007
	Totals:			5.98

Total Wt. % for C20+ Paraffins:	2.39
Largest C20+ Peak:	C20

Result : JC03A_312

Method : JCWAX1A



Sample : 97-029-2 AMOCO PMS #8 Injected : TUE JAN 21, 1997 2:16:59 PM

Run #4

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals

SUBMIT IN TRIPLICATE

1 Type of Well
☐ Oil Well ☐ Gas Well ☐ Other

2 Name of Operator
Amoco Production Company

3 Address and Telephone No. Attn: T G Tullos, m/c 17.166 (281) 366-7337
P O Box 4891, Houston, TX 77210

4 Location of Well (Footage, Sec., T., R., M., or Survey Description)
See Attachment

5. Lease Designation and Serial No.

6. If Indian, Allottee or Tribe Name

7. If Unit or CA, Agreement Designation

8. Well Name and No.
PMS 8 Federal

9. API Well No.

10. Field and Pool, or Exploratory Area

11. County or Parish, State
Eddy, NM

12 CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
☒ Notice of Intent	☐ Abandonment	☐ Change of Plans
☐ Subsequent Report	☐ Recompletion	☐ New Construction
☐ Final Abandonment Notice	☐ Plugging Back	☐ Non-Routine Fracturing
	☐ Casing Repair	☐ Water Shut-Off
	☐ Altering Casing	☐ Conversion to Injection
	☒ Other request for surface commingling	☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

See attachments

14 I hereby certify that the foregoing is true and correct

Signed Tom G. Tullos Title Sr. Business Analyst Date 02/03/97

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*See Instruction on Reverse Side