PHILLIPS KIRKLAND A1 STATE 795
SE SE 32-14N-6W YAVAPAI CO.

COUNTY YAVAPAI AREA 27 mi.W of Prescott LEASE NO. State 63280

WELL NAME PHILLIPS PETROLEUM KIRKLAND A1 STATE (Strat test)

LOCATION SE SE SEC 32 TWP 14N RANGE 6W FOOTAGE 460 FSL, 1200 FEL

ELEV ~~3640 est.~~ 3628 GR _____ KB SPUD DATE 7-2-82 STATUS P+A 9-9-82 TOTAL DEPTH 6504

COMP. DATE 9-9-82 Comp. rept. 3-1-83

CONTRACTOR Brinkerhoff Signal, 3400 Anaconda Tower, Denver, CO 80202

CASING SIZE	DEPTH	CEMENT	LINER SIZE & DEPTH

DRILLED BY ROTARY _____

DRILLED BY CABLE TOOL _____

PRODUCTIVE RESERVOIR _____

INITIAL PRODUCTION _____

FORMATION TOPS	DEPTHS	SOURCE L.L.	SOURCE E.L.	REMARKS

ELECTRIC LOGS	PERFORATED INTERVALS	PROD. INTERVALS
Temp. Log - 6506'	Induction Log 6506'	Mud Log 58'-6506'
Gam. Den. Neut - 6506'	BHC Sonic - 6506'	
Cont. Dipmtr - 6506'	Dual Induction 1082'	
BHC Sonic - 1082'	" " 6506'	

SAMPLE LOG _____

SAMPLE DESCRP. _____

SAMPLE NO. 1839

CORE ANALYSIS 1

DSTs _____

REMARKS _____

APP. TO PLUG _____

PLUGGING REP. _____

COMP. REPORT _____

WATER WELL ACCEPTED BY _____

BOND CO. SAFECO Ins. Co. of Amer.(Filed P/n 702) BOND NO. 41 00 519

DATE 9-20-80

BOND AMT. $ 25,000 CANCELLED 8-27-87 ORGANIZATION REPORT x

FILING RECEIPT 2217 LOC. PLAT x WELL BOOK x PLAT BOOK x

API NO. 02-025-20015 DATE ISSUED 2-1-82 DEDICATION _____

PERMIT NUMBER 795

CONFIDENTIAL

Release Date _____

(over)

RECEIVED

MAR 3 1983

O & G CONS. COMM.

WELL COMPLETION OR RECOMPLETION REPORT AND WELL LOG

DESIGNATE TYPE OF COMPLETION:

New Well [XX] Work-Over [ ] Deepen [ ] Plug Back [ ] Same Reservoir [ ] Different Reservoir [ ] Oil [ ] Gas [ ] Dry [X]

DESCRIPTION OF WELL AND LEASE

Operator: Phillips Petroleum Company	Address: P.O. Box 2920, Casper, WY 82602
Federal, State or Indian Lease Number or name of lessor if fee lease: Kirkland State-A (Lse #63280)	Well Number: 1 / Field & Reservoir: Wildcat
Location: 460' FSL & 1200' FEL SE SE	County: Yavapai (16)
Sec. TWP-range or Block & Survey: Sec. 32-T14N-R6W	

Date spudded	Date total depth reached	Date completed, ready to produce	Elevation (DF, RKB, RT or Gr.) feet	Elevation of casing hd. flange feet
7/2/82	9/7/82	P&A 9/9/82	GR 3628'	--

Total depth	P.B.T.D.	Single, dual or triple completion?	If this is a dual or triple completion, furnish separate report for each completion.
6504'	--	--	--

Producing interval (s) for this completion	Rotary tools used (interval)	Cable tools used (interval)
--	0 - 6504'	--

Was this well directionally drilled?	Was directional survey made?	Was copy of directional survey filed?	Date filed
No	No	--	--

Type of electrical or other logs run (check logs filed with the commission): DIL-SP-BHC, Sonic-GR, FDC-CNL-CAL-HDT

Date filed: Approx. 9/10/82

CASING RECORD

Casing (report all strings set in well—conductor, surface, intermediate, producing, etc.)

Purpose	Size hole drilled	Size casing set	Weight (lb./ft.)	Depth set	Sacks cement	Amt. pulled
Surface	12-1/4"	9-5/8"	40#	1076'	280 sx Diacel D 125 sx Class G	--

TUBING RECORD			LINER RECORD				
Size	Depth set	Packer set at	Size	Top	Bottom	Sacks cement	Screen (ft.)
-- in.	-- ft.	-- ft.	-- in.	-- ft.	-- ft.	--	--

PERFORATION RECORD			ACID, SHOT, FRACTURE, CEMENT SQUEEZE RECORD	
Number per ft.	Size & type	Depth Interval	Am't. & kind of material used	Depth Interval
--	--	--	Spotted 93 sx Class G cmt plug from 1160-970' & 25 sx cmt plug to surface.	

INITIAL PRODUCTION

Date of first production	Producing method (indicate if flowing, gas lift or pumping—if pumping, show size & type of pump:)
--	Plugged & Abandoned 9/9/82

Date of test	Hrs. tested	Choke size	Oil prod. during test	Gas prod. during test	Water prod. during test	Oil gravity
--	--	--	-- bbls.	-- MCF	-- bbls.	-- ° API (Corr)

Tubing pressure	Casing pressure	Cal'ted rate of Production per 24 hrs.	Oil	Gas	Water	Gas—oil ratio
--	--	--	-- bbls.	-- MCF	-- bbls.	--

Disposition of gas (state whether vented, used for fuel or sold): --

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the Area Manager of the Phillips Petroleum Company (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Date 3/1/83

Signature D. J. Fisher

1 - State of Ariz.
1 - B'Ville
1 - Denver 1 - File

Permit No 795

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Well Completion or Recompletion Report and Well Log
File One Copy
Form No. 4

(Complete Reverse Side)

DETAIL OF FORMATIONS PENETRATED

Formation	Top	Bottom	Description*
CORES			
1118' - 1128' -- Cored 10', Rec 9.6'			
5186' - 5191' -- Cored 5', Rec 4.5'			
6500' - 6504' -- Cored 4', Rec 18"			
NO DST'S RUN			
NO POROSITY			

Phillips Petroleum Kirkland A-1 State; Section 32, T.14 N., R.6 W., Yavapai County. T. D. at 6504 feet in Precambrian granite dated at 1.2 B. Y. with K-Ar.

* Show all important zones of porosity, detail of all cores, and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and recoveries.

INSTRUCTIONS:

Attach drillers log or other acceptable log of well.

This Well Completion or Recompletion report and well log shall be filed with the State of Arizona Oil and Gas Conservation Commission not later than thirty days after project completion.

Form No. 4

SUNDRY NOTICES AND REPORTS ON WELLS

RECEIVED
SEP 13 1982
O & G CONS. COMM.

1. Name of Operator Phillips Petroleum

2. OIL WELL [X] GAS WELL [ ] OTHER [ ] (Specify)

3. Well Name Kirkland State "A" No. 1

Location 460' FSL and 1200' FEL, SE SE

Sec. 32 Twp. 14N Rge. 6W County Yavapai, Arizona.

4. Federal, State or Indian Lease Number, or lessor's name if fee lease State Lease #63280

5. Field or Pool Name Wildcat

6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	weekly ~~MONTHLY~~ PROGRESS	[XXX]
FRACTURE TREAT	[ ]	DIRECTIONAL DRILL	[ ]	FRACTURE TREATMENT	[ ]	REPAIRING WELL	[ ]
SHOOT OR ACIDIZE	[ ]	PERFORATE CASING	[ ]	SHOOTING OR ACIDIZING	[ ]	ALTERING CASING	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]			ABANDONMENT	[ ]
(OTHER)			[ ]	(OTHER)			[ ]

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

7. 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.)

TITE HOLE - CONFIDENTIAL

Week of September 4 thru September 9, 1982 FINAL REPORT

Drld to 6320', 58'. Trip for bit. Test BOP's, manifold and kelly to 2000 psi; hydril to 1500 psi; all ok. Survey - 4-3/4 deg at 6318'. Drld to 6411', 91'. Survey - 5 deg at 6349'. Drld to 6500', 89'. Trip for wash-out, 1' below box 2nd jt above DC's. Survey - 6 deg at 6442'. COOH to log. RU Schlumberger. Ran DIL-SP-BHC Sonic-GR, FDC-CNL-GR-CAL and HDT. Loggers TD 6504. Ran velocity log, ran dipmeter. TIH w/core No. 3, rec 18". LD DC's and DP. Spotted 93 sx Class "G" cmt plug from 1160' to 970' and 25' cmt plug to surface. RDRT. ND BOP's and clean pits. Well Plugged and abandoned, rig released 6 A.M. 9/9/82. Final report.

8. I hereby certify that the foregoing is true and correct.

Signed D. J. Fisher Title Area Manager Date 9/10/82

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Sundry Notices and Reports On Wells
File One Copy
Form No. 25

Permit No. 795

9-9-82

Kirkland A1 State (795)

9-8-82 Departed office @ 1:05 pm _ went home + picked up some work clothes + departed for Prescott @ 1:35 pm
Checked in @ Sierra Motel in Prescott and departed for Rig via Iron Springs Rd thru Skull Valley (a real time saver!) _ arrived @ Rig @ 4:45 pm

were running in last few stands of drill pipe to 1160', where 93 Sx of cem were pumped in (calc to fill to 970') _ finished ± 5:30 pm

started laying dn singles + finished @ 7:00 pm 9 Sx were placed from 30' _ Surf _ finished @ 7:30 pm + departed for motel (10:00 pm, after dinner)

9-9-82 Departed for Williamson Valley @ 8:00 after break fast _

Arrived in office @ 12:40 pm

Contractor: Halliburton
Mileage : 400 ± miles

SUNDRY NOTICES AND REPORTS ON WELLS

RECEIVED
SEP 10 1982
O & G CONS. COMM.

1. Name of Operator: Phillips Petroleum

2. OIL WELL [XX] GAS WELL [ ] OTHER [ ] (Specify)

3. Well Name: Kirkland State "A" No. 1

Location: 460' FSL and 1200' FEL, SE SE

Sec. 32 Twp. 14N Rge. 6W County Yavapai, Arizona.

4. Federal, State or Indian Lease Number, or lessor's name if fee lease: State Lease #63280

5. Field or Pool Name: Wildcat

6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	weekly ~~monthly~~ PROGRESS	[XX]
FRACTURE TREAT	[ ]	DIRECTIONAL DRILL	[ ]	FRACTURE TREATMENT	[ ]	REPAIRING WELL	[ ]
SHOOT OR ACIDIZE	[ ]	PERFORATE CASING	[ ]	SHOOTING OR ACIDIZING	[ ]	ALTERING CASING	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]			ABANDONMENT	[ ]
(OTHER)			[ ]	(OTHER)			[ ]

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

7. 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.)

TITE HOLE - CONFIDENTIAL

Week of August 28, 1982 thru September 3, 1982

Drld to 5884'. Trip for bit. Drld to 6088'. Trip for washout in 179th jt DP from surface. LD 5 crooked DC's & 7 jts DP. Drld to 6262'. Trip for wash-out 101st jt - 1 ft below box. Surveys - 3 deg at 5395', 5488', 5581', and 5674', 3-1/4 deg at 5767', 4 deg at 5858', 4 deg at 6013', 5 deg at 6164', 6195', and 6226'. Mud 8.7, Vis 33, WL 12.8..

8. I hereby certify that the foregoing is true and correct.

Signed: D. J. Fisher Title: Area Manager Date: 9/3/82

D. J. Fisher

Permit No. 795

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Sundry Notices and Reports On Wells
File One Copy
Form No. 25

SUNDRY NOTICES AND REPORTS ON WELLS

RECEIVED
AUG 30 1982
O & G CONS. COMM.

1. Name of Operator Phillips Petroleum Company

2. OIL WELL [X] GAS WELL [ ] OTHER [ ] (Specify)

3. Well Name Kirkland State "A" No. 1

Location 460' FSL and 1200' FEL, SE SE

Sec 32 Twp. 14N Rge. 6W County Yavapai, Arizona.

4. Federal, State or Indian Lease Number, or lessor's name if fee lease State Lease #63280

5. Field or Pool Name

6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	MONTHLY PROGRESS	[XX]
FRACTURE TREAT	[ ]	DIRECTIONAL DRILL	[ ]	FRACTURE TREATMENT	[ ]	REPAIRING WELL	[ ]
SHOOT OR ACIDIZE	[ ]	PERFORATE CASING	[ ]	SHOOTING OR ACIDIZING	[ ]	ALTERING CASING	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]			ABANDONMENT	[ ]
(OTHER)			[ ]	(OTHER)			[ ]

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

7. 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.)

TITE HOLE - CONFIDENTIAL

Week of August 21 through August 27, 1982

Drld to 4909', trip for washout in 136th jt DP. Drld to 4964', trip for washout in box of 1st jt of DP above collars. Drld to 5071', trip for washout in box 89th jt DP from surface. Drld to 5167', trip for washout in 149th jt of DP. Drld to 5186', trip for core. Cut core from 5186-5191', 5'. COOH. Rec 4-1/2' of core. Trip in hole. Drld to 5395', trip for bit. Surveys - 3 deg at 4837', 3-1/2 deg at 4929', 3-3/4 deg at 4991', 3 deg at 5145', 3-1/4 deg at 5241', 3 deg at 5304'.Mud 8.8, Vis 39, WL 9.2.

8. I hereby certify that the foregoing is true and correct.

Signed D. F. Fisher Title Area Manager Date 8/27/82

Permit No. 795

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Sundry Notices and Reports On Wells
File One Copy
Form No 25

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AUG 23 1982
O & G CONS. COMM.

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SUNDRY NOTICES AND REPORTS ON WELLS

1. Name of Operator Phillips Petroleum Company
2. OIL WELL XX GAS WELL ☐ OTHER ☐ (Specify)
3. Well Name Kirkland State "A" No. 1
   Location 460' FSL and 1200' FEL, SE SE
   Sec. 32 Twp. 14N Rge. 6W County Yavapai, Arizona.
4. Federal, State or Indian Lease Number, or lessor's name if fee lease State Lease #63280
5. Field or Pool Name Wildcat
6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	~~MONTHLY~~ weekly PROGRESS	X
FRACTURE TREAT	☐	DIRECTIONAL DRILL	☐	FRACTURE TREATMENT	☐	REPAIRING WELL	☐
SHOOT OR ACIDIZE	☐	PERFORATE CASING	☐	SHOOTING OR ACIDIZING	☐	ALTERING CASING	☐
REPAIR WELL	☐	CHANGE PLANS	☐			ABANDONMENT	☐
(OTHER)			☐	(OTHER)			☐

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

7. 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.)

TITE HOLE - CONFIDENTIAL

Week of August 14 thru August 20, 1982

Drld to 4300'. COOH. Test BOP, Kelly & kill line manifold to 2000 PSI, hydril to 1500 PSI. All OK. WIH. Ream 4256' to 4300'. Drld to 4351', lost pump press. COOH to check bit. OK. Seats washed in both pumps. Repaired, WIH. Drld to 4676', trip for bit. Drld to 4770', trip for bit. Drld to 4820'. Surveys - 4 deg at 4287', 3-1/4 deg at 4348' and 4409', 3-3/4 deg at 4471', 4537', 4595', 3-1/4 deg at 4654', 4 deg at 4715', 3-1/2 deg at 4770'. Mud 8.7, Vis 38, WL 13.4

8. I hereby certify that the foregoing is true and correct.

Signed D. J. Fisher Title Area Manager Date August 20, 1982

D. J. Fisher

Permit No. 795

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Sundry Notices and Reports On Wells
File One Copy
Form No. 25

7-14-82

P[ ]lips Petro. Kirkland[ ]1 State (795)

7-13-82 Departed Phx @ 1:00 p.m.
Arrived in Prescott @ 3:20 pm + checked out the motel situation – none available.
Arrived at Rig @ 6:00 p.m. – were mid-way into running of the 9 5/8" csg.; finished running to 1070' + started cementing ± 7:10 p.m. – displaced 345 Sx of Diacel mix + neat cement – no returns at the surface. Departed Rig for Kingman @ 8:00pm

Arrived in Kingman @ 10:25 pm. + checked in at the Silver Queen Motel

7-14-82 Departed Kingman @ 6:20 a.m. + arrived @ Rig @ 9:00 a.m. – had already felt for the top of the cem. in the annulus @ ± 80 feet.

With 1" pipe hanging @ 70' pumped in 26 Sx of cem. + filled to about cellar floor level, then dropped a few feet – will let stand till 12:00/1:00 pm. + then cut off conductor. If cem. is low will pour ready mix from the surface.

Cementing company: Halliburton, El Centro, CA

Called from Kirland @ 10:30 a.m. + departed for Phx. stopped briefly @ Kirland + at Wickenburg for lunch.
Arrived @ office @ 2:15 p.m.

(521 miles)

RECEIVED
AUG 16 1982
O & G CONS. COMM.

SUNDRY NOTICES AND REPORTS ON WELLS

1. Name of Operator: Phillips Petroleum Company
2. OIL WELL [X] GAS WELL [ ] OTHER [ ] (Specify)
3. Well Name: Kirkland State "A" No. 1
   Location: 460' FSL & 1200' FEL, SE SE
   Sec. 32 Twp. 14N Rge. 6W County Yavapai, Arizona.
4. Federal, State or Indian Lease Number, or lessor's name if fee lease: State Lease #63280
5. Field or Pool Name: Wildcat
6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	~~WEEKLY~~ weekly PROGRESS	[X]
FRACTURE TREAT	[ ]	DIRECTIONAL DRILL	[ ]	FRACTURE TREATMENT	[ ]	REPAIRING WELL	[ ]
SHOOT OR ACIDIZE	[ ]	PERFORATE CASING	[ ]	SHOOTING OR ACIDIZING	[ ]	ALTERING CASING	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]			ABANDONMENT	[ ]
(OTHER)			[ ]	(OTHER)			[ ]

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

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TITE HOLE - CONFIDENTIAL

Week of August 7, 1982 through August 13, 1982

Drld to 3860'. Trip for bit. Drld to 4075'. COOH, trip for survey instrument - broken line. Recovered survey tool. WIH, Drld to 4287'. Surveys - 2-1/4 deg at 3554', 3 deg at 3645' and 3704', 3-1/4 deg at 3828', 3 deg at 3889' and 3982', 3-1/2 deg at 4075', 3-3/4 deg at 4133' and 4163' and 4225'. Mud 8.9, Vis 30, WL 12.8

8. I hereby certify that the foregoing is true and correct.

Signed: D. J. Fisher Title: Area Manager Date: 8/13/82

Permit No. 795

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Sundry Notices and Reports On Wells
File One Copy
Form No. 25

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AUG 9 1982
O & G CONS. COMM.

SUNDRY NOTICES AND REPORTS ON WELLS

1. Name of Operator Phillips Petroleum Company
2. OIL WELL [X] GAS WELL [ ] OTHER [ ] (Specify)
3. Well Name Kirkland State "A" No. 1
   Location 460' FSL & 1200' FEL, SE SE
   Sec. 32 Twp. 14N Rge. 6W County Yavapai, Arizona.
4. Federal, State or Indian Lease Number, or lessor's name if fee lease State Lease #63280
5. Field or Pool Name Wildcat
6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]
FRACTURE TREAT	[ ]	DIRECTIONAL DRILL	[ ]
SHOOT OR ACIDIZE	[ ]	PERFORATE CASING	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]
(OTHER)			[ ]

SUBSEQUENT REPORT OF:

WATER SHUT-OFF	[ ]	~~MONTHLY~~ weekly PROGRESS	[XX]
FRACTURE TREATMENT	[ ]	REPAIRING WELL	[ ]
SHOOTING OR ACIDIZING	[ ]	ALTERING CASING	[ ]
		ABANDONMENT	[ ]
(OTHER)			[ ]

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TITE HOLE - CONFIDENTIAL

Week of July 31 through August 6, 1982

Drld to 3117'. Trip for bit. Drld to 3461'. Trip for bit. Drld to 3471'. Surveys - 2-1/4 deg at 2695', 2-1/2 deg at 2879', 2-1/2 deg at 2971', 2-1/4 deg. at 3208' and 3300', 2-1/2 deg at 3311', 2-1/4 deg at 3402', 2 deg at 3461'. Mud 8.7, Vis 33, WL 10.

8. I hereby certify that the foregoing is true and correct.

Signed D. J. Fisher Title Area Manager Date 8/6/82

D. J. Fisher

Permit No. 795

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Sundry Notices and Reports On Wells
File One Copy
Form No. 25

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AUG 2 1982
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SUNDRY NOTICES AND REPORTS ON WELLS

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2. OIL WELL [X] GAS WELL [ ] OTHER [ ] (Specify)
3. Well Name: Kirkland State-A No. 1
   Location: 460' FSL & 1200' FEL, SE SE
   Sec. 32 Twp. 14N Rge. 6W County Yavapai, Arizona.
4. Federal, State or Indian Lease Number, or lessor's name if fee lease: State Lease #63280
5. Field or Pool Name: Wildcat
6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]
FRACTURE TREAT	[ ]	DIRECTIONAL DRILL	[ ]
SHOOT OR ACIDIZE	[ ]	PERFORATE CASING	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]
(OTHER)			[ ]

SUBSEQUENT REPORT OF:

WATER SHUT-OFF	[ ]	~~MONTHLY~~ weekly PROGRESS	[XXX]
FRACTURE TREATMENT	[ ]	REPAIRING WELL	[ ]
SHOOTING OR ACIDIZING	[ ]	ALTERING CASING	[ ]
		ABANDONMENT	[ ]
(OTHER)			[ ]

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

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TITE HOLE - CONFIDENTIAL

Week of July 24 through July 30, 1982

Drld to 2251', trip for bit. Drld to 2443', trip for bit. Drld to 2663', trip for bit. Drld to 2680'. Trip to test BOP's. Tstd BOP's and manifold to 2000 psi, OK. Hydril to 1500 psi, OK. Surveys - 2 deg at 2028' and 2090', 2 deg at 2151' and 2303', 1-3/4 deg at 2366', 2 deg at 2417', 2-1/2 deg at 2611'. Mud 8.7, Vis 34, WL 10.

8. I hereby certify that the foregoing is true and correct.

Signed D. J. Fisher Title Area Manager Date 7/30/82

D. J. Fisher

Permit No. 795

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Sundry Notices and Reports On Wells
File One Copy
Form No. 25

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JUL 26 1982
O & G CONS. COMM.

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SUNDRY NOTICES AND REPORTS ON WELLS

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3. Well Name Kirkland State-A No. 1
   Location 460' FSL & 1200' FEL, SE SE
   Sec. 32 Twp. 14N Rge. 6W County Yavapai, Arizona.
4. Federal, State or Indian Lease Number, or lessor's name if fee lease State Lease #63280
5. Field or Pool Name Wildcat
6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]
FRACTURE TREAT	[ ]	DIRECTIONAL DRILL	[ ]
SHOOT OR ACIDIZE	[ ]	PERFORATE CASING	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]
(OTHER)			[ ]

SUBSEQUENT REPORT OF:

WATER SHUT-OFF	[ ]	~~MONTHLY~~ Weekly PROGRESS	[XX]
FRACTURE TREATMENT	[ ]	REPAIRING WELL	[ ]
SHOOTING OR ACIDIZING	[ ]	ALTERING CASING	[ ]
		ABANDONMENT	[ ]
(OTHER)			[ ]

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

7. 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.)

TITE HOLE - CONFIDENTIAL

Week of July 17 through July 23, 1982

Drld to 1118'. COOH. WIH to cut core #1. Cored 1118-1128', 10'. COOH, rec 9.6'. LD core bbl. PU BHA & WIH. Drld to 1311'. Trip for bit. Drld to 1991'. Trip for bit. Tested BOP's, OK to 2000 psi and hydril to 1500 psi. Surveys - 3/4 deg at 1152', 1/2 deg at 1277', 3/4 deg at 1506', 3/4 deg at 1637', 1 deg at 1801', 1-1/4 deg at 1874' and 1935'. Mud 8.7, Vis 32, WL 11.
Mud 8.7, Vis 32, WL 11

8. I hereby certify that the foregoing is true and correct.

Signed D. J. Fisher Title Area Manager Date 7/23/82

D. J. Fisher

Permit No. 795

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Sundry Notices and Reports On Wells
File One Copy
Form No. 25

RECEIVED
JUL 19 1982
O & G CONS. COMM.

SUNDRY NOTICES AND REPORTS ON WELLS

1. Name of Operator: Phillips Petroleum Company
2. OIL WELL [X] GAS WELL [ ] OTHER [ ] (Specify)
3. Well Name: Kirkland State-A No. 1
   Location: 460' FSL & 1200' FEL, SE SE
   Sec. 32 Twp. 14N Rge. 6W County Yavapai, Arizona.
4. Federal, State or Indian Lease Number, or lessor's name if fee lease: State Lease #63280
5. Field or Pool Name: Wildcat
6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	~~MONTHLY~~ weekly PROGRESS	[X]
FRACTURE TREAT	[ ]	DIRECTIONAL DRILL	[ ]	FRACTURE TREATMENT	[ ]	REPAIRING WELL	[ ]
SHOOT OR ACIDIZE	[ ]	PERFORATE CASING	[ ]	SHOOTING OR ACIDIZING	[ ]	ALTERING CASING	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]			ABANDONMENT	[ ]
(OTHER)			[ ]	(OTHER)			[ ]

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

7. 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.)

TITE HOLE - CONFIDENTIAL

Week of July 10 through July 16, 1982

Fin trip for bit. Drld to 1001'. Trip for bit. Drld to 1011', DP parted. WIH w/OS, went by fish. COOH. PU bent sub. WIH w/OS on bent sub, work over fish. COOH w/fish. LD fish & OS. WIH w/bit. Drld to 1080'. Circ. COOH. RU Schl. WIH to log. Ran DILL and BHC SONIC loggers TD 1082'. WIH. Circ. COOH. Ran 25 jts 9-5/8" 40# K-55 8 RD ST&C range 3 csg w/guide shoe & float collar. Tally 1077'. Set at 1076' RKB. Cmtd w/280 sx diacel D w/2% gel. Tailed in w/100 sx class G. Plug down at 8:00 PM, 7/13/82. Good returns throughout. No cmt to surface. Tagged cmt at 80'. Ran 1" down annulus and cmtd to surface w/ 25 sx class G cmt. Cut off conductor and 9-5/8" csg. Welded on csg head. NU BOP. Test BOP, kill line manifold and kelly cock to 2000 psi, OK. Test hydril to 1500 psi, OK. PU 15 6-1/4" DC's. WIH. Drld float collar, 40' cmt and shoe. Drld 7-7/8" hole to 1087'. Surveys - 3/4 deg at 867', 3/4 deg at 982', 1/4 deg at 1080'. Mud 8.4, Vis 27.

8. I hereby certify that the foregoing is true and correct.

Signed M. K. Smart for D. Fisher
D. J. Fisher
Title Area Manager Date 7/16/82

Permit No. 795

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Sundry Notices and Reports On Wells
File One Copy
Form No. 25

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JUL 15 1982 RY
O & G CONS. COMM.

SUNDRY NOTICES AND REPORTS ON WELLS

1. Name of Operator Phillips Petroleum Company
2. OIL WELL [X] GAS WELL [ ] OTHER [ ] (Specify)
3. Well Name Kirkland State-A No. 1
   Location 460' FSL & 1200' FEL, SE SE
   Sec. 32 Twp. 14N Rge. 6W County Yavapai, Arizona.
4. Federal, State or Indian Lease Number, or lessor's name if fee lease State Lease #63280
5. Field or Pool Name Wildcat
6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]
FRACTURE TREAT	[ ]	DIRECTIONAL DRILL	[ ]
SHOOT OR ACIDIZE	[ ]	PERFORATE CASING	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]
(OTHER)			[ ]

SUBSEQUENT REPORT OF:

WATER SHUT-OFF	[ ]	Weekly ~~Monthly~~ PROGRESS	[XX]
FRACTURE TREATMENT	[ ]	REPAIRING WELL	[ ]
SHOOTING OR ACIDIZING	[ ]	ALTERING CASING	[ ]
		ABANDONMENT	[ ]
(OTHER)			[ ]

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

7. 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.)

TITE HOLE - CONFIDENTIAL

INITIAL REPORT

Week of June 30 through July 9, 1982

9000' Paleozoic Structural Strat Exploratory Test Well.
RURT 7/1/82. Spudded 12-1/4" surface hole at 11:30 am, 7/2/82. Drld to 325'. COOH. PU 12-1/4" 3-pt reamer and one 12-1/4" bumper sub. WIH. COOH for plugged jet. Drld to 419'. Trip to inspect BHA & PU 2 DC's. Drld to 738'. Now tripping for bit. Surveys - 3/4 deg at 62', 1/2 deg at 225', 1 deg at 297', 1/4 deg at 343', 0 deg at 373', 1/2 deg at 419', 1 deg at 492', 3/4 deg at 650', 1/2 deg at 713'. Mud 8.6, Vis 31, WL 14..

8. I hereby certify that the foregoing is true and correct.

Signed D. J. Fisher Title Area Manager Date 7/9/82

Permit No. 795

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Sundry Notices and Reports On Wells
File One Copy
Form No. 25

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MAR 7 1983
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AKS
04

PLUGGING RECORD

Operator: Phillips Petroleum Company	Address: P.O. Box 2920, Casper, WY 82602
Federal, State, or Indian Lease Number, or lessor's name if fee lease: Lse #63280 Kirkland State-A	Well No.: 1
Field & Reservoir: Wildcat	
Location of Well: 460' FSL & 1200' FEL, SE SE Sec. 32-T14N-R6W	Sec-Twp-Rge or Block & Survey
County: Yavapai	
Application to drill this well was filed in name of: Phillips Petroleum Company	Has this well ever produced oil or gas: No
Character of well at completion (initial production): Oil (bbls/day): 0	Gas (MCF/day): 0
Dry?: Yes	
Date plugged: 9/9/82	Total depth: 6504'
Amount well producing when plugged: Oil (bbls/day): 0	Gas (MCF/day): 0
Water (bbls/day): 0	

Name of each formation containing oil or gas. Indicate which formation open to wellbore at time of plugging	Fluid content of each formation	Depth interval of each formation	Size, kind & depth of plugs used. Indicate zones squeeze cemented, giving amount cement
None	None	----	Spotted 93 sx Class G cmt plug from 1160-970' & 25' cmt plug to surface.

CASING RECORD

Size pipe	Put in well (ft.)	Pulled out (ft.)	Left in well (ft.)	Give depth and method of parting casing (shot, ripped, etc.)	Packers and shoes
9-5/8"	1076'	--	1076'	No Recovery	Shoe at 1076'

Was well filled with mud-laden fluid, according to regulations? Yes

Indicate deepest formation containing fresh water. NA

NAMES AND ADDRESSES OF ADJACENT LEASE OPERATORS OR OWNERS OF THE SURFACE

Name	Address	Direction from this well:
Information not available to this office.		

In addition to other information required on this form, if this well was plugged back for use as a fresh water well, give all pertinent details of plugging operations to base of fresh water sand, perforated interval to fresh water sand, name and address of surface owner, and attach letter from surface owner authorizing completion of this well as a water well and agreeing to assume full liability for any subsequent plugging which might be required.

NA

Use reverse side for additional detail.

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the Area Manager of the Phillips Petroleum Company (company) and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Date: 3/3/83

Signature: D. J. Fisher

1 - State of Arizona
1 - B'Ville
1 - Denver
1 - File

Permit No. 795

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Plugging Record
File One Copy

Form No. 10

Geological Well Prognosis
for
PPCO. KIRKLAND STATE NO. 1

A. Lithologies Expected to be Encountered

The well is expected to spud in Precambrian granite and penetrate approximately 1000 feet of crystalline rock. The next section from 1000 ft. to T.D. (9000 ft.) is interpreted to be Paleozoic in age. The Paleozoic rocks are composed of a wide variety of sedimentary strata including both carbonates and clastics ranging from shales and mudstones to sandstones. It is possible that some or all of the lithology in this section is composed of Precambrian crystalline rock including metasediments and metavolcanics (schists and amphibolities), and granite.

B. Potential Drilling Program

Lost circulation could possibly occur within fractured Precambrian crystalline rocks and within porous Paleozic sedimentary rocks. Since at least two major thrust faults are expected to be encountered, lost circulation might occur within these fault zones. Also steep dips might be encountered while crossing these thrust faults which would cause deviation problems.

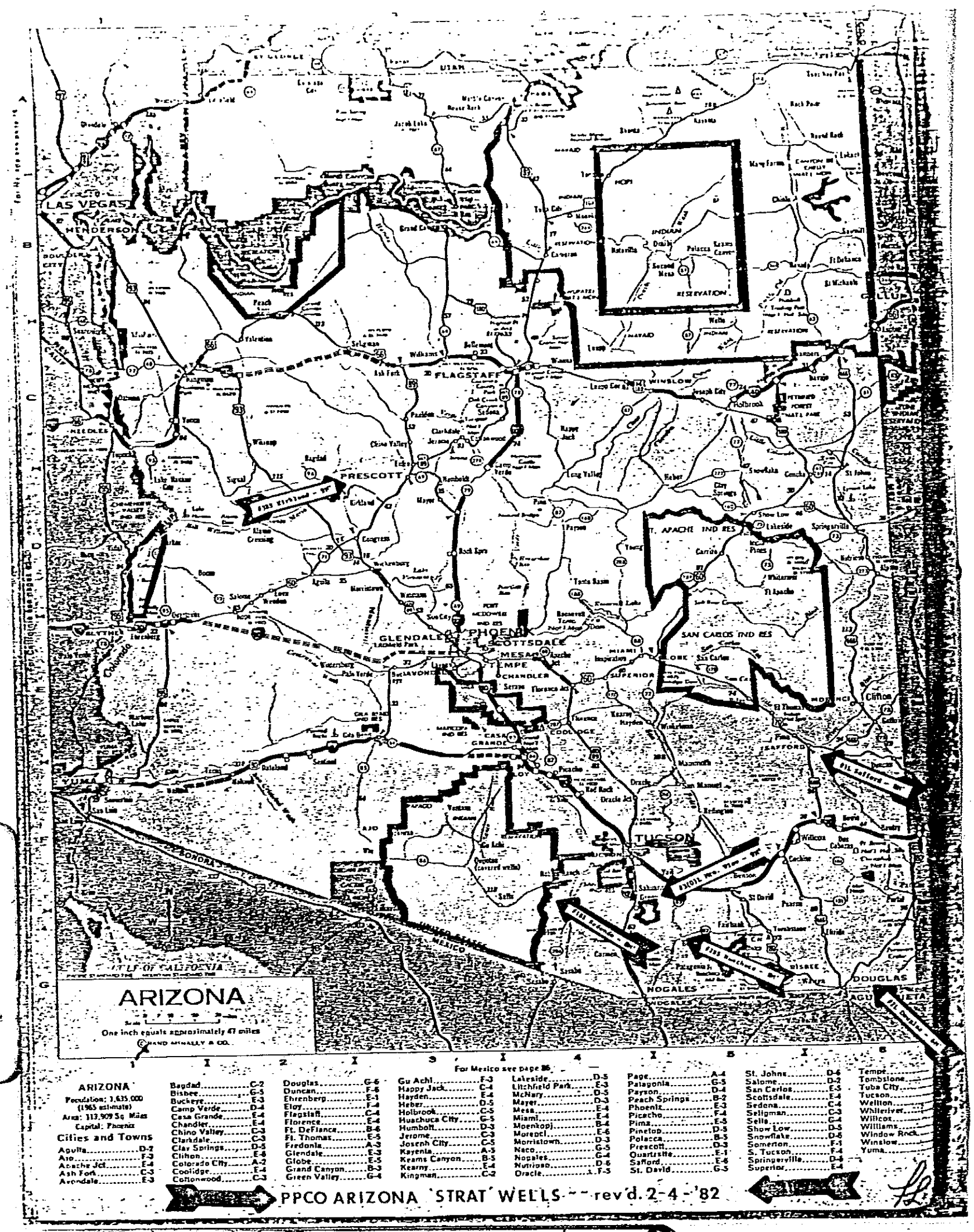
Recommended Mud Program

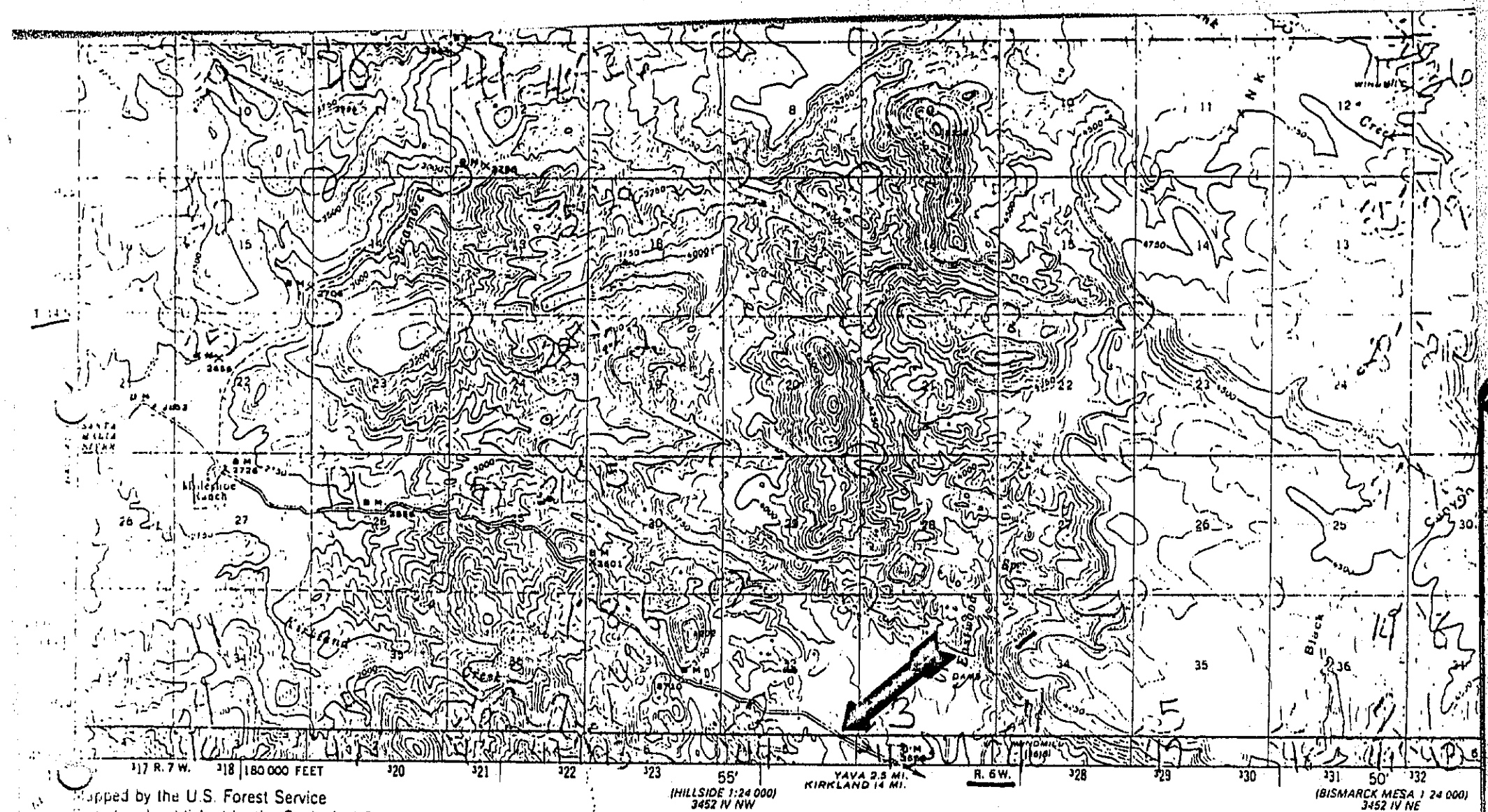
The mud should have sufficient viscosity and low water loss to insure good samples and ingauge hole conditions for the log runs throughout the drilling of this well.

At the present time in this very sparsely drilled area, we are unaware of any abnormally pressured zones. We, therefore, anticipate normally pressured (.433# per foot) reservoir pressures to total depth.

FGL/fb
Attach.

cc: D. J. Fisher
P. B. Hammaker
F. G. Lyte (4)
J. L. Sanford
Norman Johnson (2)
A. K. Doss, AR. O&G


ARIZONA
One inch equals approximately 47 miles
LAS VEGAS
HENDERSON
FLAGSTAFF
WINSLOW
PRESCOTT
PHOENIX
GLENDALE
SCOTTSDALE
MESA
TEMPE
CHANDLER
TUCSON
NOGALES
DOUGLAS
YUMA
SAN CARLOS IND RES
T. APACHE IND RES
HOPI
INDIAN
RESERVATION
UTAH
MEXICO
GULF OF CALIFORNIA
For Mexico see page 86
ARIZONA
Population: 1,635,000
(1965 estimate)
Area: 113,909 Sq. Miles
Capital: Phoenix
Cities and Towns
Aguila D-2
Aja F-3
Apache Jct E-4
Ash Fork C-3
Avondale E-3
Bagdad C-2
Bisbee G-5
Buckeye E-3
Camp Verde D-4
Casa Grande E-4
Chandler E-4
Chino Valley C-3
Clarkdale C-3
Clay Springs D-5
Clifton E-6
Colorado City A-2
Coolidge E-4
Cottonwood C-3
Douglas G-6
Duncan F-6
Ehrenberg E-1
Eloy F-4
Flagstaff C-4
Florence E-4
Ft. DeFiance B-6
Ft. Thomas E-5
Fredonia A-3
Glendale E-3
Globe E-5
Grand Canyon B-3
Green Valley G-4
Gu Achi F-3
Happy Jack C-4
Hayden E-4
Heber D-5
Holbrook C-5
Huachuca City G-5
Humboldt D-3
Jerome C-3
Joseph City C-5
Kayenta A-5
Kearns Canyon B-5
Kearny E-4
Kingman C-2
Lakeside D-5
Litchfield Park E-3
McNary D-5
Mayer D-3
Mesa E-4
Miami E-4
Moenkopi B-4
Morenci E-6
Morristown D-3
Naco G-5
Nogales G-4
Nutrioso D-6
Oracle F-5
Page A-4
Patagonia G-5
Payson D-4
Peach Springs B-2
Phoenix E-3
Picacho F-4
Pima E-5
Pinetop D-5
Polacca B-5
Prescott D-3
Quartzsite E-1
Safford E-6
St. David G-5
St. Johns D-6
Salome D-2
San Carlos E-5
Scottsdale E-4
Sedona C-4
Seligman C-3
Sells G-4
Show Low D-5
Snowflake D-6
Somerton F-1
S. Tucson F-4
Springerville D-6
Superior E-4
Tempe
Tombstone
Tuba City
Tucson
Wellton
Whiteriver
Willcox
Williams
Window Rock
Winslow
Yuma
PPCO ARIZONA 'STRAT' WELLS -- rev'd. 2-4-'82



Mapped by the U.S. Forest Service
Edited and published by the Geological Survey

Control by USC&GS, USFS and GS

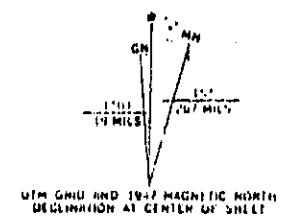
Topography from aerial photographs by KEK plotter
Aerial photographs taken 1946. Field check 1947

Polyconic projection. 1927 North American datum
10 000 foot grid based on Arizona coordinate system,
central zone

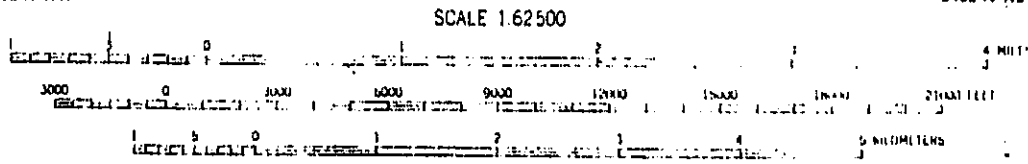
No distinction is made between dwellings, barns,
commercial and industrial buildings

Dashed land lines indicate approximate location

Ticks for Universal Transverse Mercator grid ticks,
zone 13 in blue

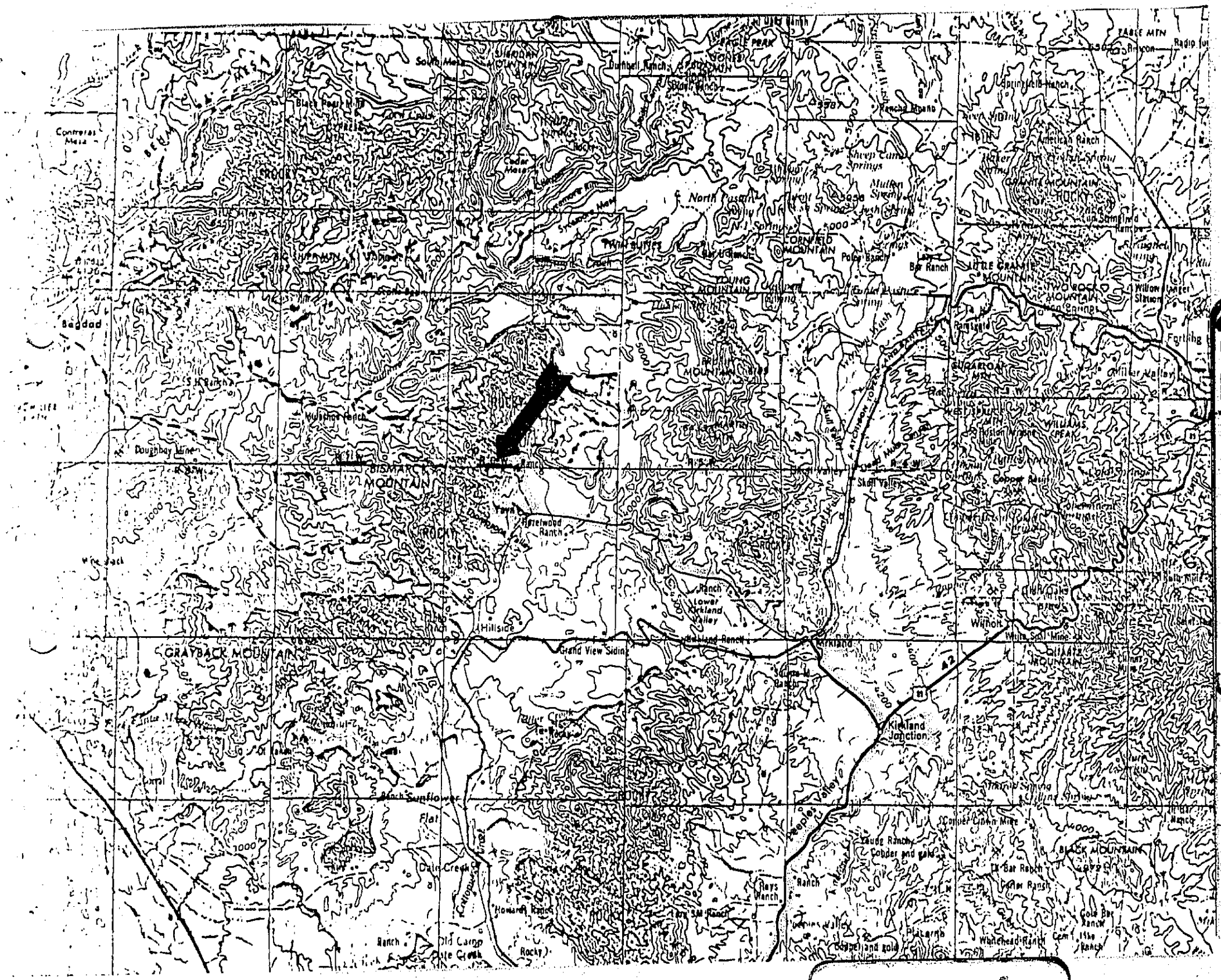


SCALE 1:62 500

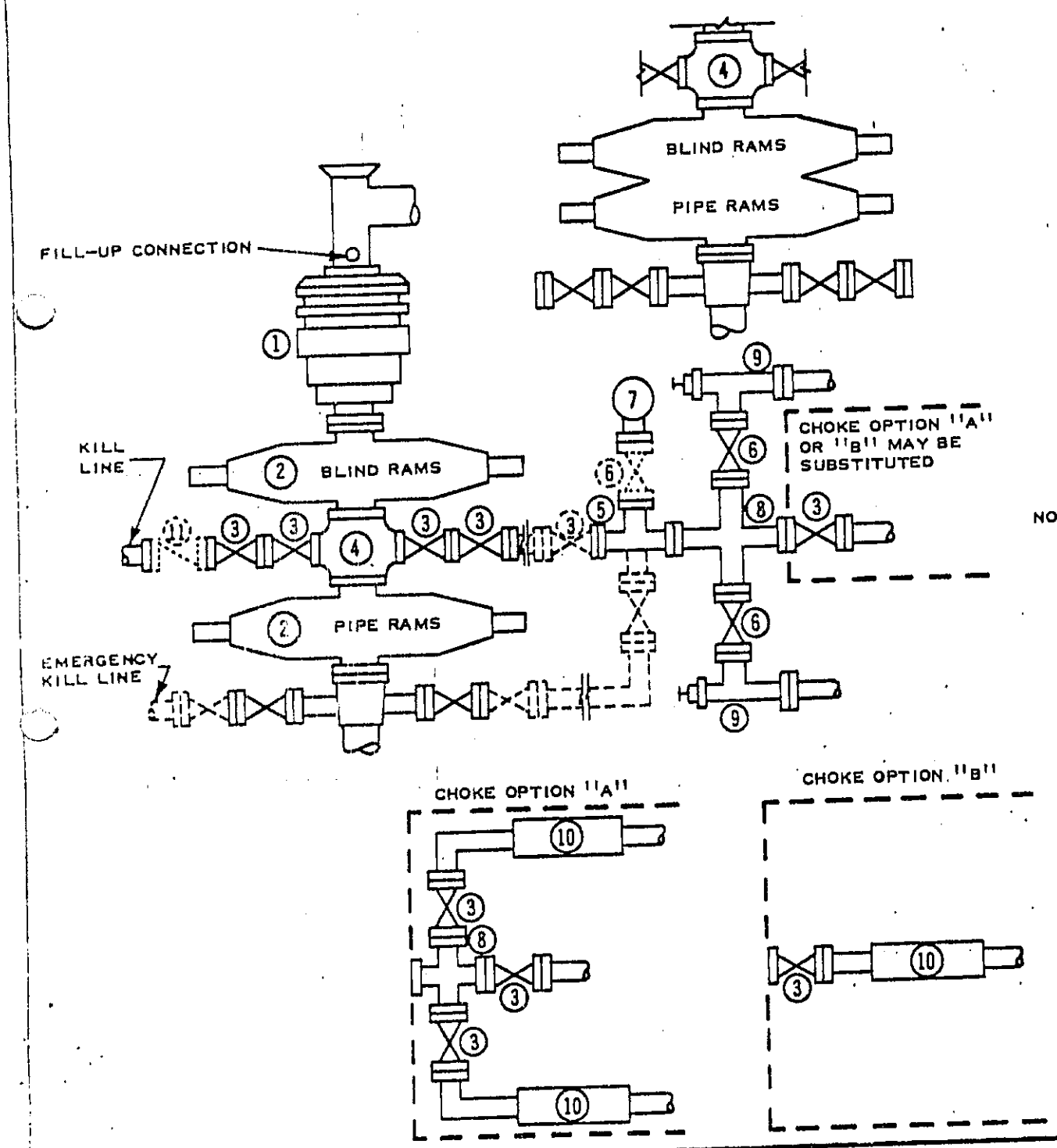


CONTOUR INTERVAL 50 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST


EAGLE PEAK
TABLE MTN
Dunbell Ranch
Sheep Camp Springs
Mullen Spring
American Ranch
GRANITE MOUNTAIN
ROCKY
North Fork
CORNFIELD MOUNTAIN
Poley Ranch
Bar Ranch
LITTLE GRANITE MOUNTAIN
TWO ROCKS MOUNTAIN
YOUNG MOUNTAIN
Baghdad
SUGARLOAF MTN
WILLIAMS PEAK
Doughboy Line
BISMARCK MOUNTAIN
Hazelwood Ranch
Copper Basin
Lower Kirkland Valley
Hillside
Grand View Siding
Kirkland
Kirkland Junction
GRAYBACK MOUNTAIN
Black Sunflower Flat
Howard Ranch
Old Camp Site Creek
Rays Ranch
Cobder and gold
BLACK MOUNTAIN
Plateau
Whitehead Ranch

DOUBLE PREVENTER OPTION



1. SER. 900 HYDRIL "GK"
2. SER. 900 RAM-TYPE BOP
3. 3" SER. 900 VALVE
4. SER. 900 DRILLING SPOOL
5. 3" SER. 900 X 2" SER. 900 STEEL TEE
6. 2" SER. 900 VALVE
7. 2" MUD PRESSURE GAUGE
8. 3" SER. 900 X 2" SER. 900 STEEL CROSS
9. 2" SER. 900 ADJ. CHOKE
10. HYDRAULIC CHOKE, 2500 PSI WP OR BETTER
11. 3" SER. 900 CHECK VALVE

NOTES:

1. 3000 PSI WP OR BETTER CLAMP HUBS MAY BE SUBSTITUTED FOR FLANGES
2. ONE ADJUSTABLE CHOKE MAY BE REPLACED WITH A POSITIVE CHOKE
3. VALVES MAY BE EITHER HAND OR POWER OPERATED BUT, IF POWER OPERATED, THE VALVES FLANGED TO THE BOP RUN MUST BE CAPABLE OF BEING OPENED AND CLOSED MANUALLY OR CLOSE ON POWER FAILURE AND BE CAPABLE OF BEING OPENED MANUALLY

..... OPTIONAL EQUIPMENT

PHILLIPS PETROLEUM COMPANY

3000 PSI WORKING PRESSURE

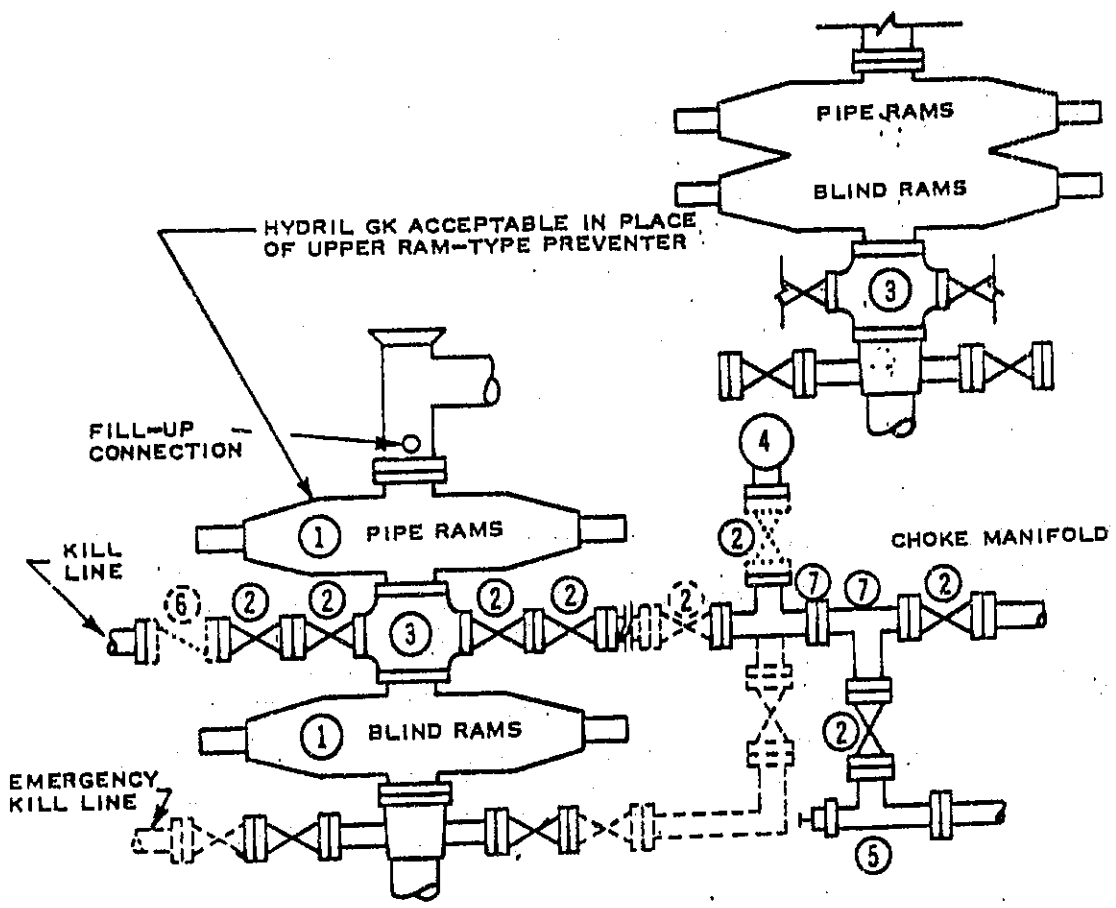
BLOWOUT PREVENTER HOOK-UP

(SERIES 900 FLANGES OR BETTER)

REV 6/73

FIGURE NO. 6

DOUBLE PREVENTER OPTION



① SERIES 900 RAM-TYPE BOP

② 2" SERIES 900 VALVE

③ SERIES 900 DRILLING SPOOL

④ 2" MUD PRESSURE GAUGE

⑤ 2" SERIES 900 CHOKE

⑥ 2" SERIES 900 CHECK VALVE

⑦ 2" SERIES 900 STEEL TEE

NOTES:

1. 3000 PSI WP CLAMP HUBS MAY BE SUBSTITUTED FOR FLANGES

2. VALVES MAY BE EITHER HAND OR POWER OPERATED BUT, IF POWER OPERATED, THE VALVES FLANGED TO THE BOP RUN MUST BE CAPABLE OF BEING OPENED AND CLOSED MANUALLY OR CLOSE ON POWER FAILURE AND BE CAPABLE OF BEING OPENED MANUALLY

..... OPTIONAL EQUIPMENT

PHILLIPS PETROLEUM COMPANY

3000 PSI WORKING PRESSURE BLOWOUT PREVENTER HOOK-UP

(SERIES 900 FLANGES OR BETTER)

REV 6/73

FIGURE NO. 7

PHILLIPS PETROLEUM COMPANY

ARIZONA STRAT WELLS

HOLE SIZE AND CASING PROGRAM:

Hole Size	Casing Size	Depth
12-1/4"	9-5/8"	1000'-2000'±
7-7/8"	-	T.D.

INTERVAL	MUD TREATMENT AND PROPERTIES
0-9-5/8" C.P.	Spud Mud. Mix 10.0 lbs/bbl, Bentonite 15 lbs/bbl. Diacel® diatomateous solids, 3 to 5 lbs/bbl fibrous type LCM. This mixture of materials will produce a fluid that will clean the hole efficiently, minimize hole enlargement and treat all but very major mud losses as they are drilled. Use the above ratio of materials to maintain and/or rebuild volume as needed.
9-5/8" C.P.-T.D.	(1.) Drill out of surface casing with water and discard cement contaminated fluid.
	(2.) In clean, fresh water - mix caustic soda to obtain 9.5 to 10.5 pH.
	(3.) Mix sack ratio of 8 sks. bentonite to 1 sk. Drispac® polymer to build funnel voscosity of 34 to 38 sec/qt.
	(4.) Stay on this (8:1) bentonite/Drispac ratio at all times to maintain viscosity. This ratio will produce a low solids drilling fluid that will automatically have a controlled water loss w/good thin, slick filter cake that should keep the hole in good shape for logging, coring, and D.S.T.'s. This fluid should bring up clean, large cuttings which will aid geological evaluation of formations drilled.
	(5.) Drilling water supply is likely to be a major cost item on this well. Therefore, a semi-closed mechanical solids control system should be utilized. (A.) High speed, fine screen shale shakers (using finest screens feasible), (B.) Desander and mud cleaner or desilter units that will each handle 50% more volume than that being circulated. (C.) A high speed - high volume centrifuge to discard maximum low gravity drilled solids, will also be considered.

(6.) Maintain Mud:

Weight - 8.6 to 9.2 #/gal or minimum needed to maintain good hole conditions w/mech. solids control equipment and water.

Viscosity - 36 to 42 sec/qt. w/8:1 Bentonite & Drispac ratio. Stay on this ratio at all times. 45 to 50 sec/qt. to log, DST or core.

Water Loss - 10.0 to 5.0 cc w/additional Drispac as needed above that used for vis. ratio.

pH - 9.5 to 10.5 w/caustic soda.

Total Hardness - Below 300 PPM w/soda ash.

Rheology - Run non-dispersed if possible. Control gel strengths with sack ratio of 1 sk. Desco® thiner to 2 sks lignite, only if needed. Use sparingly.

Loss of Circulation - Do not carry LCM in mud, unless absolutely necessary, in order to be able to utilize all mech. solids control equipment.

A. If extra pit is available: Mix in water - 3 lbs/bbl Ground Paper, 1/2 sk/bbl Diacel D® and 5 lbs/bbl Med. Qwik-Seal (wait to mix Qwik-Seal until loss occurs). When loss is detected while drilling - pull up off bottom, spot above slurry (25 to 50 bbl) in bottom of hole and pull enough drill pipe to get above slurry. 1) Wait 30 minutes; if hole will fill, close hydril and pump into annulus at 1 ± bbl/min until pressure build-up is noticed (100± psi) on drill pipe, watch for bleed-off and repeat until 20± bbls mud has been pumped or holding pressure build-up can be achieved. After above volume is pumped and hole will stand full, wait 30 minutes, break circulation, go back to bottom and drill, 2) If hole will not fill after spotting above slurry, spot another like slurry volume.

B. On serious, complete and sustained losses, the attached Diaseal M® squeeze procedure will be used. NOTE: Substitute Ground Paper when Flosal is not to be used).

NOTES: (1.) Mud materials and service will be supplied by N/L Baroid Mud Co.

(2.) Any significant changes in the program or mud products used must be cleared through the Phillips Casper District Office (307-237-3791) and notification of same to Glen Slater (303) 779-8989 Ext. 384.

(3.) Daily mud check sheets must include total daily mud cost, each material used w/cost and cumulative cost. Also report on-location inventory of mud materials if this is not already a pert of mud check form.

(4.) Once each week mail legible copies of mud check sheets to PPCo., Glen I. Slater, 7800 E. Eldorado Place Room 245, Englewood, CO 80111.

(5.) Submit well recap and mud cost summary to Casper Office and Glen Slater upon completion of well.

cc: D. J. Fisher
P. B. Hammaker
F. G. Lyte
Dist. & Reg. Files
Glen I. Slater (2) Phillips Petroleum Co., 7800 East Dorado Place, Room 245, Englewood, CO 80111

Brinkerhoff-Signal Drilling Co. (2) Redondo State #1

N/L Baroid Mud Co. (2)

E. E. Clear, (1) Drlg. Spec. Co., 309 Short St., B'Ville, OK 74004

RECEIVED
APR 7 1982
O & G CONS. COMM.

AKD
RAY
Geol
OS

PHILLIPS PETROLEUM COMPANY
P.O. Box 2920
Casper, WY 82602

April 2, 1982

Mr. A. L. Michaelis
Box 178
Evanston, Wyoming 82930

RE: Kirkland State "A" No. 1

The following pertains to drilling the subject "Strat Test".

Status: Tight Hole
AFE: P-U588
API No. 02-025-20015
Location: 450' FSL, 1200' FEL, Sec. 32-T14N-R6W
Yavapai County, Arizona

Project T. D. - 9,000'

State Archaeological - cleared
State Agriculture & Horticulture - cleared

Well Site Directions: Approximately 20 miles west of Prescott, Arizona. From Prescott go 22 miles southwest on Hwy 89 to Kirkland Junction, then 14 miles northwest to Kirkland on State Hwy 96, continue on Hwy 96 (towards Bagdad) and drive 3.5 miles northwest of Java on Hwy 96 to rig site just north of Hwy 96.

Surface: Muleshoe Ranch. Manager is Tom Lindahl (602) 442-3244

Lease: Arizona State #63280

Drilling Contractor: Brinkerhoff-Signal No. 9 (Farmington, New Mexico (505) 327-5025).

Water: Purchase and haul.

Communications: Motorola Radio link from B'Ville Comm. Contact is Ed Gilliland (918) 661-9058. Back up is Don Ballew (918) 661-8199.
Local Service contact for installation and maintenance is Motorola Service Station, Tucson, Arizona, Art Lippolis, Mgr. (602) 624-4423.
Business Radio License KNBJ-928 covers. Rig Phone number (602)_____ -_____
Datotek scramblers will be provided.

Drilling & Casing Program:

Drill 12-1/4" hole to 1000'± . Set 9-5/8" and TD with 7-7/8" hole. Set 1 jt. of 14" conductor; drill 12-1/4" hole, to firm casing seat at approximately 1000'. Run 9-5/8" 40# K-55 ST&C Casing (3759 psi Burst, 2487 psi Collapse, 324,000# Tensile. 4860 ft-lbs optimum torque w/3650 ft-lbs minimum & 6080 ft-lbs. maximum torque). Run one centralizer directly above the shoe, another on the second joint, another approximately 150' above the shoe and then every 200 ±' to the surface. Use Philube API modified thread lubricant, circulate casing volume of 114 bbls. Preflush with 20 bbls. fresh water spacer followed by 820 sx (100% excess) of Class "G" cement w/1/2% CFR-2 @ 15.8 ppg. Run standard Super Seal Float Collar and Float Shoe. Howco in El Centro has FC&FS and 8 centralizers and will bring to location. WOC 18 hrs. before commencing to nipple-up.

Drilling Mud-Program attached. Materials and service to be supplied by Baroid under Farmington, New Mexico Office. District Manager of Baroid is Bob Hogg, Farmington (505) 325-1896 (o) and (505) 325-5486 (r). Local contacts are Bill Harder, Tucson, (602) 885-8910; Tim Adams Solar City, New Mexico (505) 388-3315; Dennis Woods, Sr. Engr. Phoenix, (602) 963-8069.

Mobils:	Dennis Woods	(0414) (602) 253-6143
	Bill Harder	(0110) (602) 624-6646
	Tim Adams	(2445) (505) 538-5376

Mobils are not direct dial; Woods and Harders are with General Communications; Adams is with Sierra Communications; numbers in parenthesis refer to unit or vechicle radios numbers with these services.

BOP's-Nipple up after setting 9-5/8" per BOP Standard Figure 6 or 7 (depending upon rig equipment). Test BOP's initially and first trip out-of-hole after Tuesday, A.M. With 1000' of casing, test pressure need not exceed 1500 psig.

Mud Logging Unit - Continental Laboratories will furnish hydrocarbon well logging services and Exploration has contracted. Contact is Continental Labs, Denver, Colorado, Steve Leibbrand (303) 751-0101.

Well Head - Three 9-5/8" S.O. x 10" Series 900 Braden Heads w/3 R53 Ring Gaskets and 2 boxes of nuts and bolts were purchased from National Supply, Farmington, (505) 325-1723 and hauled to Baroids Tucson yard with a load of mud from Baroid in Farmington.

Formation Tops

Precambrian Granite	Spud
Thrust (Precambrian/Paleozoic)	1000'
Top of Paleozoic Horizon	6500'
Thrust (Paleozoic/Paleozic)	7500'
T. D.	9000'

Objective Horizons

Primary objective is to test horizons interpreted from seismic reflectors to be Paleozoic in age. Objectives within the Paleozoic include the Mississippian Redwall Limestone and the Devonian Martin Limestone.

Logging Program

Run No. 1

12 1/4" Hole Surface to 1000' or deeper (9-5/8" csg. pt.)

1. DIL-SP-BHC Sonic-GR

If hole is deeper than 1,000', also run;

2. FDC-CNL-GR Caliper
3. HDT

Run No. 2

8 1/2" Hole 9-5/8" csg. depth-T.D.

1. DIL-SP-BHC Sonic-GR
2. FDC-CNL-GR Caliper
3. HDT

All electric logs will be taped; distribution of logs will be by Exploration. Two sets of maximum reading thermometers, three per set, in the ranges of 100 deg.-300 deg. F. will be available for use on all logging runs. Thermometers should have been recently calibrated.

Coring Program

At the direction of the Phillips' Wellsite Geologist cores or sidewall cores will be taken in intervals of stratigraphic interest, intervals exhibiting significant hydrocarbon shows and/or at T.D.

Cores will be measured, marked and clearly labelled prior to being packed in boxes. A sheet of paper bearing the well name, core number and interval will be inserted in a plastic sample sack and packed within each box prior to securing the lid. Each box will be labelled on either end with well name, core number and interval.

Sample Program

Sample catching at 10 feet intervals, will commence at the surface or as soon thereafter as is practicable and will be continued to T.D.

Detailed instructions and requirements covering the number of sets requireed, sample treatment, handling, packaging, and shipping instructions will be covered in a separate memorandum.

Telephone reports by Well Site Geologist will be given to Merrill Evans or Ted Bigbee.

Relevant Telephone Numbers:

DEX Telecopier	303-779-8834
Phillips Petroleum Office-Denver	303-779-8989
Merrill Evans ext. 608	Residence 303-789-6149
Ted Bigbee ext. 613	Residence 303-751-5950
Phillips Petroleum Office-Denver (Night Line)	303-779-8971

GENERAL PROCEDURE FOR USING UNWEIGHTED DIASEAL M® OR "MODIFIED" DIACEL D® SLURRY

1) Pull drill string above loss zone or a considered safe distance off bottom when starting to mix the HWL-HS slurry.

2) Put kelly back on--continue to work pipe if in open hole.

3) Mix Diaseal M® or "Modified" Diacel D® slurry--at least 100 bbls. See attached sheet for guide to materials needed and mixing procedures.

4) Mix LCM--continue to work pipe while mixing.

5) Pump mixture in hole and displace drill pipe with mud.

6) Pull up into surface casing or a safe distance above where slurry would fill hole considering no loss to formation. Fill hole through fill-up line.

7) If hole does not fill after pumping about one foot of mud out of pits, mix another slurry volume and repeat procedure. On severe losses when slurry w/normal amounts of LCM is not adequate to seal loss, consider going in hole with open-end drill pipe and pumping out pieces of burlap bags. Cut bags (across bag) into four pieces, soak in mud, roll and drop into drill pipe at surface. Drop 100 quarters then displace out of drill pipe with mud. Follow with another 100 bbl Diaseal slurry (Step 5) and continue squeeze procedure.

8) If hole stands full or has circulated some during Step 5, proceed as follows:

   Close pipe rams or Hydril, pump very slowly through fill-up line at 0-300 psi and squeeze. When pressure starts to build or is indicated while pumping, hesitate (watch for pressure bleed-back) then pump again until a low holding pressure can be established--somewhere between 50 and 300 psi. Hold available pressure for 20-45 minutes. When a squeeze pressure cannot be established wait about 2 hours, then if hole will stand full and circulate with drill string in upper position, go back to bottom and drill.

A low squeeze pressure is highly desirable because incipient fractures in the fractured loss zones will often be opened and plugged immediately, thus reinforcing the zone and decreasing the chance of loss or avoiding later losses. To be most effective, as much of the loss zone as possible should be penetrated before applying this squeeze technique.

Getting a successful squeeze depends entirely upon the high water loss/high solids slurry being placed in the hole so that it will go into the zone of loss. If the loss zone(s) is suspected to be back up the hole rather than at or near bottom, then consideration should be given to running some type tool to locate the zone(s) taking mud.

PROCEDURE FOR MIXING A DIASEAL M® HWL-HS SQUEEZE SLURRY

I. Gun in 100 bags of Diaseal M in 87 bbls water.

II. Gun in ±1,000 lbs fibrous type LCM and the finished 100 bbl of squeeze slurry is ready to pump.

III. If there is very much bentonite or clays left in pit to be used, a few sacks of lime mixed ahead of the other material would insure a high water loss slurry.

IV. If pre-mix or pill pit is available Diacel M® could be mixed and on stand-by. Then when needed, the LCM could be gunned in and slurry would be ready for displacement.

PROCEDURE FOR MIXING A "MODIFIED" DIACEL D® HWL-HS SQUEEZE SLURRY

I. Materials needed for 100 bbls of unweighted slurry:

Water	-	87 bbls
Lime	-	1 (50#) bag
Flosal®	-	6 (50#) bags (or Ground Paper)
Diacel D®	-	100 (50#) bags
LCM	-	±1,000 lbs (±10 lbs/bbl) Fibrous and/or granular type

II. Order of mixing:

1) In ±50 bbls water mix 1 sk lime and 6 sks Flosal®. Gun good with maximum pressure on mud guns in order to mix and shear Flosal®.

2) When Flosal® is mixed well, continue to gun pit while adding remainder of water. Dump the 100 sks of Diacel D® directly into pit under mud guns.

3) Then dump in LCM under mud guns and mix thoroughly.

III. If pre-mix or pill pit is available, the lime, Flosal® and Diacel D® could be mixed and on stand-by. Then when needed, the LCM could be gunned in and slurry would be ready for displacement.

IV. If Flosal® viscosifier cannot be used, simply add extra Diacel D® (as much as ±80 ppb) to obtain thickness desired or needed for adequate suspending ability for LCM or Barite. Extra Diacel D® will help make a better slurry.

NOTE: The Diaseal M® or Diacel D® slurries may be mixed with whatever type water is in use in mud. If oil mud is in use, then make-up oil can be used to compound slurry; however, this should be pilot tested.

GIS:jg 12/11/81

GENERAL PROCEDURE FOR USING WEIGHTED DIASEAL M® OR "MODIFIED" DIACEL D® SLURRY

1) Mix slurry according to attached tables, adding Diacel M® or Diacel D®, Barite and LCM in order. If this is an oil slurry, a minute amount of oil wetting agent will be needed to lower viscosity as Barite (water wet particle) is added. A separate mixing or blending pit is advisable as well as a pump truck to handle and accurately place weighted slurries.

2) Place bottom of drill pipe far enough up into casing (or a safe distance above loss zone if in long open hole section and impractical to be in casing) to displace all of slurry into open hole and bottom of casing. Do not squeeze through bit openings less than 16/32" diameter with LCM in slurry. Open end squeeze is desirable.

3) Pick up slurry with pump truck and displace it out of drill pipe with mud. If up in casing when slurry starts out of drill pipe, close B.O.P.'s making sure annulus is full. If RTT's tool is used, it should be set. Either action prevents migration. When slurry hits open hole, slow pump down to 1/2 to 3/4 bbl/min. If in long open hole section, displace and lay slurry just as laying a cement plug. Pull well above displaced slurry or up into casing before closing BOP's on full annulus.

4) Stage slurry into formation, a few barrels at a time, pumping at rate of 1/4 bbl/min, hesitating for several minutes. Continue this cycle until pressure begins to build with probable pressure build-ups and bleed-offs. A final holding pressure of 300-900 psi is desirable.

5) Hold pressure for two hours before releasing and resume drilling operations.

6) a. Where break-down and loss of circulation is a reasonable distance below a casing shoe, run a slurry volume equal to twice open hole volume.

   b. Where loss is on bottom with long open hole section open, run at least 100 bbl slurry volume.

7) Slurry remaining in hole after squeeze will not contaminate the mud system nor will it set-up like cement. As mud is circulated past a Diaseal M® plug within the formation, the low permeability mud cake will form a final seal over the plug.

FORMULA FOR PREPARING ONE BARREL DIASEAL M® OR MODIFIED DIACEL D® SLURRY WITH FRESH OR SEA WATER*

Density Lb/Gal.	Diaseal M® Lb.	Diaseal M® Sack	Barite* Sack	Water Bbl.
9	50	1.00	0	.87
10	50	1.00	0.6	.84
11	47	.94	1.2	.80
12	42	.84	1.8	.77
13	39	.76	2.3	.74
14	35	.68	2.9	.70
15	31	.62	3.5	.67
16	28	.56	4.0	.63
17	25	.50	4.6	.60
18	22	.44	5.2	.56
19	17	.34	5.8	.52

*If saturated salt water is used, Barite must be decreased 0.6 sack per barrel.

FORMULA FOR PREPARING DIASEAL M® SLURRY WITH OIL*

FOR 100 BBL. OF SLURRY

Density Lb/Gal.	Diaseal M® Sacks	Barite Sacks	Oil Bbl.
8	88	38	88.0
9	82	88	85.5
10	76	138	83.0
11	70	188	80.5
12	65	238	77.0
13	60	290	74.5
14	54	343	72.0
15	48	397	69.5
16	43	452	67.0
17	38	508	64.5
18	33	565	61.0

*Because of variations of oil and Barite, pilot tests should be made to determine exact formulations. If slurry becomes too thick, add up to 1 lb/bbl oil wetting agent to thin.

---

25 lb/bbl of nut shells can be used in above formulations without change. If absorbent lost circulation materials are added, the slurry viscosity will increase. This slurry is effective without conventional lost circulation materials.

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FEB 1 1982

O & G CONS. COMM.

APPLICATION FOR PERMIT TO DRILL OR RE-ENTER

APPLICATION TO DRILL ☒ STRAT TEST RE-ENTER OLD WELL ☐

PHILLIPS PETROLEUM COMPANY

NAME OF COMPANY OR OPERATOR

P.O. Box 2920 | Casper | Wyoming 82602

Address | City | State

BRINKERHOFF SIGNAL

Drilling Contractor

3400 Anaconda Tower, Denver, Colorado 80202

Address

DESCRIPTION OF WELL AND LEASE

Federal, State or Indian Lease Number, or if fee lease, name of lessor: State Lease #63280 (Kirkland State)	Well number: A#1	Elevation (ground): 3640 (est)
Nearest distance from proposed location to property or lease line: 660 feet	Distance from proposed location to nearest drilling, completed or applied—for well on the same lease: None on this lease feet	
Number of acres in lease: 2554.08	Number of wells on lease, including this well, completed in or drilling to this reservoir: 1	
If lease, purchased with one or more wells drilled, from whom purchased: N/A	Name	Address
Well location (give footage from section lines): 460 FSL & 1200 FEL	Section—township—range or block and survey: 32-T14N-R6W G&SRM	Dedication (Comply with Rule 105): 80 Acres
Field and reservoir (if wildcat, so state): Wildcat	County: Yavapai	
Distance, in miles, and direction from nearest town or post office: 27 miles West of Prescott, AZ.		
Proposed depth: 9000'	Rotary or cable tools: Rotary	Approx. date work will start: 5/15/82
Bond Status on file Amount $25,000	Organization Report On file X Or attached	Filing Fee of $25.00 Attached X

Remarks: Well information confidential

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the Area Manager of the Phillips Petroleum Company (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

2- Arizona O&GC
1-Bartlesville Prod.
1- T. J. Jobin
1- File

Signature D. J. Fisher

Date January 27, 1982

Permit Number: 795

Approval Date: 2-1-82

Approved By: [illegible]

Notice: Before sending in this form be sure that you have given all information requested. Much unnecessary correspondence will thus be avoided.

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Application to Drill or Re-enter
File Two Copies

Form No. 3

(Complete Reverse Side)

1. Operator shall outline the dedicated acreage for *both* oil and gas wells on the plat.

2. A registered professional engineer or land surveyor registered in the State of Arizona or approved by the Commission shall show on the plat the location of the well and certify this information in the space provided.

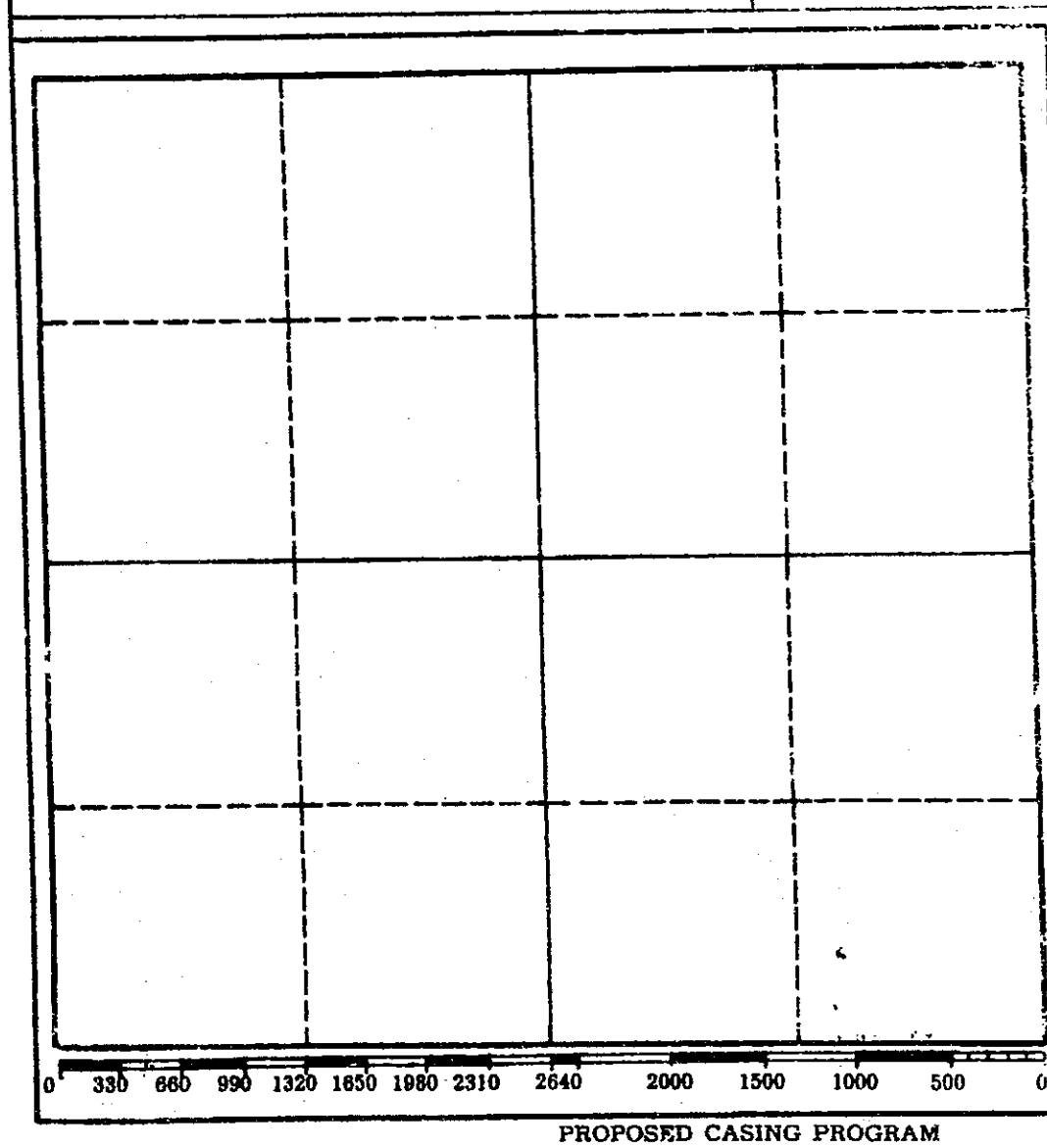
3. All distances shown on the plat must be from the outer boundaries of the Section.

4. Is the Operator the only owner in the dedicated acreage outlined on the plat below? YES____ NO X

5. If the answer to question four is "no," have the interests of all the owners been consolidated by communitization agreement or otherwise? YES X NO____ If answer is "yes," Type of Consolidation Joint venture

6. If the answer to question four is "no," list all the owners and their respective interests below:

Owner	Land Description
Phillips, Et Al	Per lease #, reverse



CERTIFICATION

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

Name: D. J. Fisher

Position: Area Manager

Company: Phillips Petroleum Co.

Date: January 27, 1982

I hereby certify that the well location shown on the 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: To be forwarded

Registered Professional Engineer and/or Land Surveyor

Certificate No.

PROPOSED CASING PROGRAM

Size of Casing	Weight	Grade & Type	Top	Bottom	Cementing Depths	Sacks Cement
9-5/8"	40#	K-55	Surf.	1000'±	0-1000'	As required

FORM F-106

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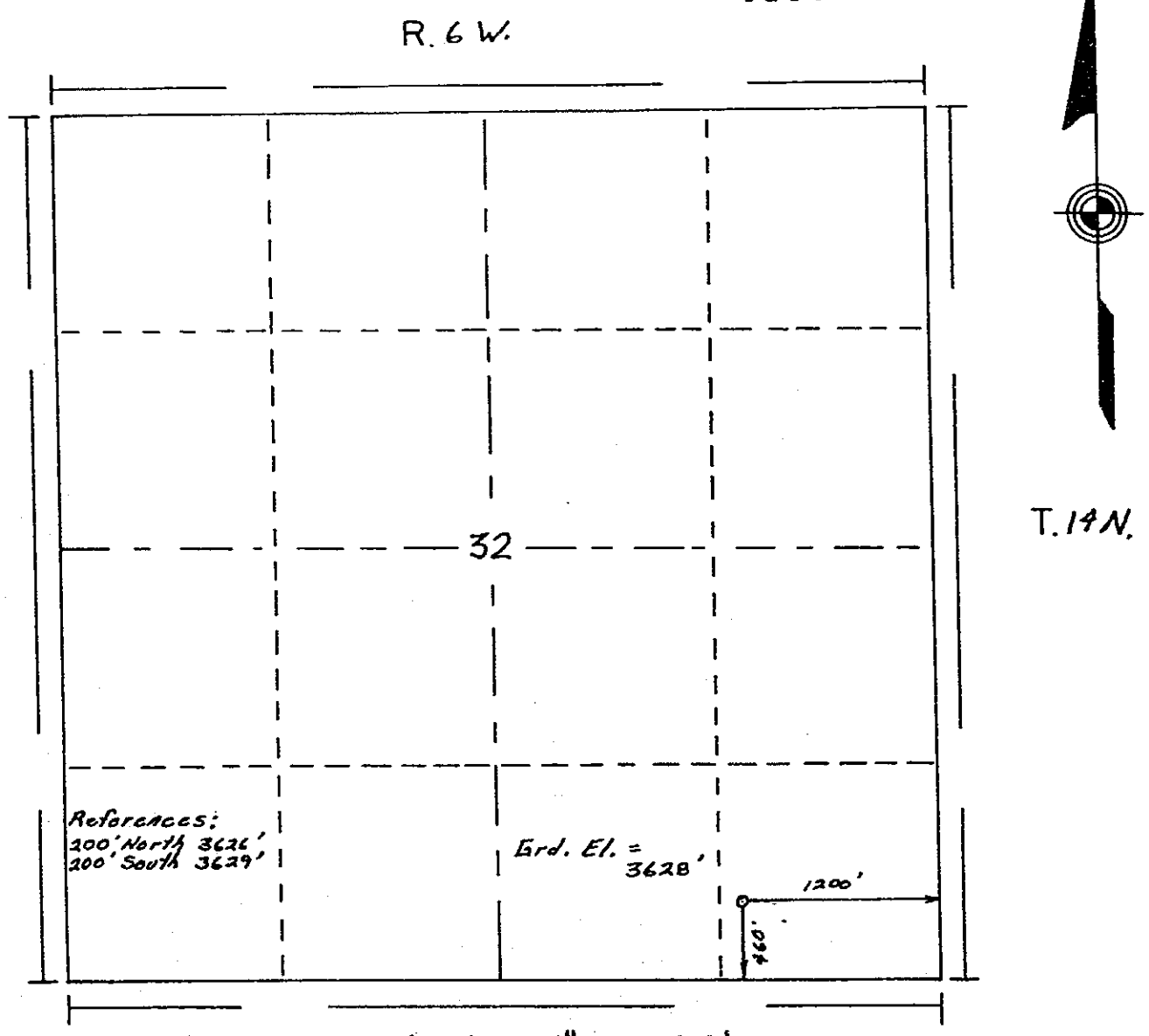
FEB 2 1982
O & G CONS. COMM.



Scale··· 1" = 1000'

Powers Elevation of Denver, Colorado
has in accordance with a request from *Frank Lyte*
for *Phillips Petroleum*
determined the location of *#1 Kirkland State A*
to be *460' FSL & 1200' FEL* Section *32* Township *14 North*
Range *6 West* *Gila & Salt River* Meridian
Yavapai County, *Arizona*

I hereby certify that this plat is an accurate representation of a correct survey showing the location of

Date: *1-25-82*

Gerald G. Huddleston
Licensed Land Surveyor No. *6844*
State of *New Mexico*

PERMIT TO DRILL

This constitutes the permission and authority from the

OIL AND GAS CONSERVATION COMMISSION,
STATE OF ARIZONA,

To: PHILLIPS PETROLEUM COMPANY
(OPERATOR)

to drill a well to be known as

KIRKLAND A1 STATE
(WELL NAME)

located 460' FROM SOUTH LINE & 1200' FROM EAST LINE (SE SE)

Section 32 Township 14 NORTH Range 6 WEST, YAVAPAI County, Arizona.

The N/A of said Section, Township and Range is dedicated to this well.

Said well is to be drilled substantially as outlined in the attached Application and must be drilled in full compliance with all applicable laws, statutes, rules and regulations of the State of Arizona.

Issued this 1st day of February, 19 82.

OIL AND GAS CONSERVATION COMMISSION

By [signature]
EXECUTIVE SECRETARY

PERMIT No. 795

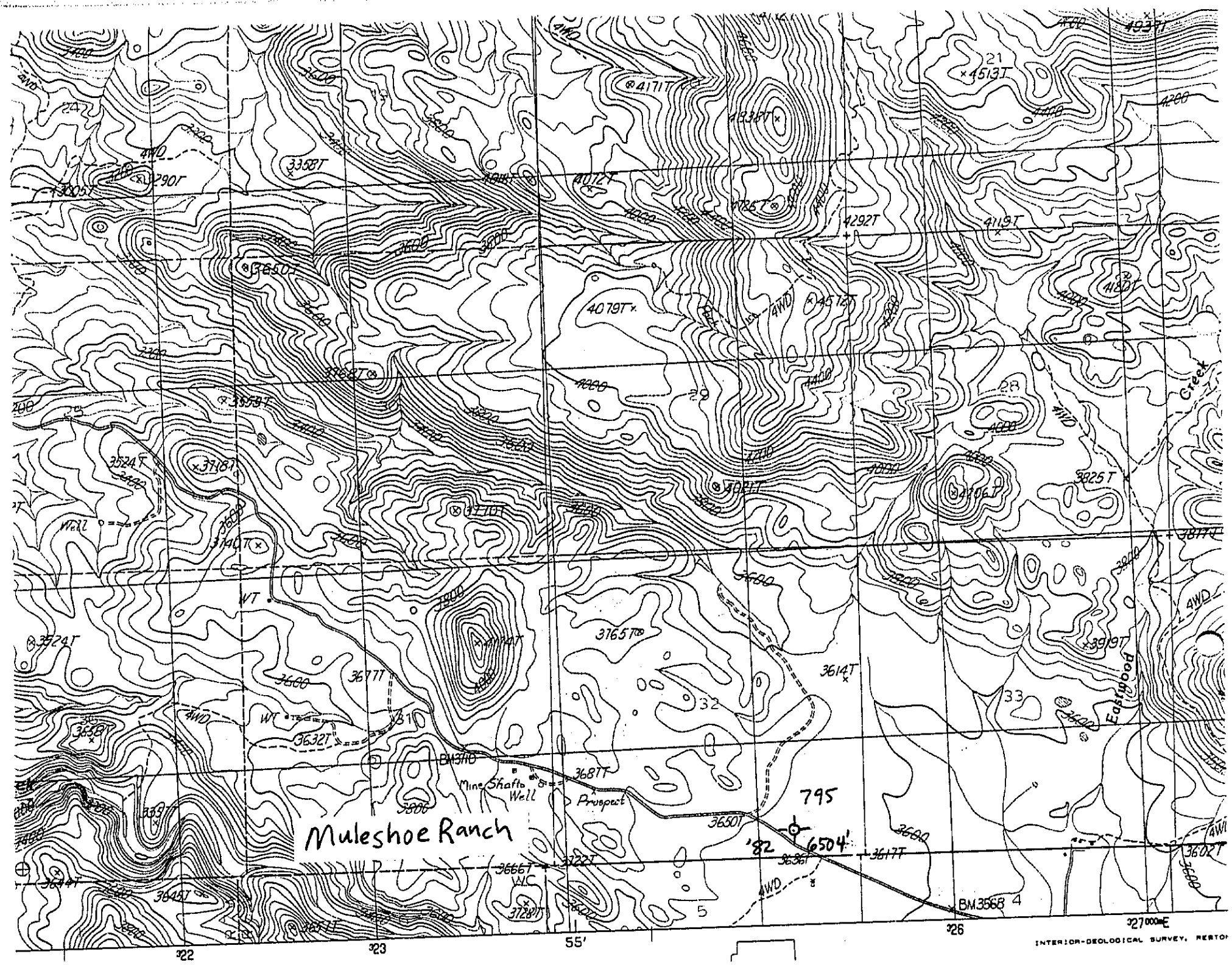
RECEIPT NO. 2217

API NO. 02-025-20015

State of Arizona
Oil & Gas Conservation Commission
Permit to Drill

FORM NO. 27

TEN FOOT SAMPLES ARE REQUIRED FROM SURFACE


Muleshoe Ranch
Mine Shafts
Well
Prospect
795
'82
6504'
Eastwood
Creek
BM3568
4171T
4193T
4513T
4292T
4119T
4079T
4572T
4180T
3825T
3765T
3614T
3677T
3632T
3687T
3650T
3617T
3602T
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3710T
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3706T
3919T
3817T
3358T
3290T
3305T
3850T
3764T
3659T
3658T
3806T
3411T
3937T
55'
INTERIOR-GEOLOGICAL SURVEY, RESTON

795

-Bartlesville file copy 3/83-

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JUL 27 1983
O & G CONS. COMM.

PHILLIPS PETROLEUM

VELOCITY SURVEY

with

CALCULATION OF SYNTHETIC SEISMOGRAM

Kirkland State #A-1
Yavapai County, Arizona

CGG
Department of Development Geophysics
1475 Lawrence Street
Denver, Colorado 80202

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* * * *

APPENDIX 1: Observer's Report and Location Sketch

APPENDIX 2: Lists of Symbols for Computer Printouts

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FOREWORD

This report is organized in three parts. The first part concerns the Velocity Survey, including a field operation report and a description of the seismic data, processing sequence and results.

The second part concerns the Synthetic Seismogram with an overview of the processing sequence and a presentation of the results.

The third part includes comments, conclusions, and recommendations for future surveys. Seismic traces were processed by Loretta Douglas, and the Synthetic Seismogram was produced by Dave Horowitz. The report was prepared under the supervision of Gildas Omnes and Charlie Wu.

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SYN-3: Log Plots on a Linear Depth Scale

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a) Time scale 5"/sec
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SECTION-2: Flattened Downgoing Events With Stack

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Figure 1: Normalized Raw Data of Checkshots After Summing (16 levels)

Figure 2: Equalized Raw Data of Checkshots

Figure 3: Normalized Displays of Signature Probe

a. Signature on Ground Beside Bell

b. Signature 4 feet Below Gun Bell

Figure 4: Frequency Analysis of First Arrivals

Figure 5: F-K Filter

PART ONE: THE VELOCITY SURVEY

A. Field Operation Report

1. General Information

a. Well Information

Name of the Well:	Kirkland State #A-1
Area:	Yavapai County, Arizona
Coordinates:	Sec 32, T14N, R6W
Ground Elevation:	3628 feet
Kelly Bushing Elevation:	3643 feet
DP Elevation:	2600 feet
Correction Velocity:	12,094 ft/sec
Depth of Casing:	1077 feet
Depth of Mud:	Not available

b. Survey Information

Date:	September 6, 1982
Type of Survey:	Checkshot
Station Interval:	Variable
Survey Range:	200 to 6500 feet
Number of Stations:	28
Maximum Depth Under KB:	6500 feet
Distance Source-Wellhead:	70.6 feet

2. Personnel

Party Chief/Senior Observer	Bob Estes
Junior Observer:	Royce Gupton
Logging Crew:	SCHLUMBERGER

3. Equipment

Source:	Air Gun
Downhole Tool:	SIE 14 Hz
Signature Probe:	14 Hz Geophone
Recording System:	SN 338 B and CDX Stacker

4. Recording Parameters

Sampling Rate:	2 milliseconds
Recording Length:	6 seconds
HC Filter:	125 Hz
LC Filter:	OUT
60 Hz. Notch:	IN

B. Results

1. Checkshots

a. Procedure

The downhole tool was lowered to the bottom of the well (6500 feet), and the Air Gun was positioned 70.6 feet away from the wellhead. As the tool was pulled up the well, we recorded the seismic trace at each of the 28 levels. Duplicate levels were recorded on the first 24 stations. These 24 traces were later summed together producing 12 traces.

b. Signature Probe

Three signature probes were recorded, two signature probes being four feet below the bell and one probe located beside the bell. These three probes were summed in the same way as the seismic traces. The comparison of the three probes may indicate several factors including deformation of the surface caused by the Air Gun and changes in the source location. For the most part, the first break of each signature probe was constant throughout the survey, particularly on the buried probe (see Figure 3b).

c. Time Picking

After demultiplexing, normalized and equalized plots of the traces were produced (Figures 1 and 2). The normalized plot shows that the S/N ratio is good at all stations for the first arrivals.

Because the onsets of first arrivals are very sharp, they were picked manually on a large scale display. The time picks are pre-

sented in column "T" on the "Velocity Survey Computation Forms" (see Appendix 3).

All times were corrected to vertical (assuming a straight raypath) and used to calibrate the integrated Sonic log for the calculation of the Synthetic Seismogram.

Seismic times show that the experimental value for correction to a datum plane at 2600 feet must be 12,094 ft/sec.

C. Additional Processing

In order to verify that the results of a checkshot survey can be used to correlate with the seismic section and Synthetic Seismogram, the following steps were taken:

1. Shaping Deconvolution

Before deconvolution, a bandpass filter of (8,12,40,45) Hz was used to filter out some of the high frequency noise. This filter was also passed over the operator in order to improve the S/N ratio.

An operator 155 ms in length was used for shaping deconvolution. After this step, the data quality was much better and upgoing events could be observed.

2. Time Variant Filter and F-K Filter (Figure 5)

A time variant filter of (8,45) Hz at the beginning and (8,40) Hz at time 3000 ms was applied to the data after shaping deconvolution. After the first breaks were flattened, an F-K reject filter (-60,000 ft/sec, 60,000 ft/sec) was used to filter out coherent noise

and downgoing events, then a static correction was applied to put the upgoing events in their proper positions. The same F-K reject filter was used to filter out the upgoing events at the upgoing events' lined-up position. Then a static correction was applied to put the downgoing events in their proper positions.

3. Upgoing Events Stacked (see Plate SECTION-1)

After flattening, shaping deconvolution, time variant filtering, and F-K filtering, the upgoing events are stacked. These may be correlated with the seismic section and Synthetic Seismogram. Tick marks on the upgoing section indicate time of the first breaks; this makes it possible to determine accurately the origin of a reflection (intercept of the reflection lineup on the depth scale with the line of ticks).

4. Downgoing Events Stacked (see Plate SECTION-2)

After flattening, shaping deconvolution, time variant filtering, and F-K filtering, the downgoing events are stacked. These can be used to correlate with the seismic section and Synthetic Seismogram.

PART TWO: THE SYNTHETIC SEISMOGRAM

A. Wireline Log Preparation

The Sonic log was recorded by SCHLUMBERGER and digitized from a paper plot (scale 1/200th) from 1100 to 6490 feet below Kelly Bushing (KB). The SCHLUMBERGER Density log was also digitized from a 1/200th scale paper plot from 1100 to 6490 feet and sampled every foot. The Sonic was extended to ground level (GL) with a constant average velocity of 12,232 ft/sec to enable calculation of multiples. Transit times of the Sonic log were integrated in order to obtain the depth at every 1 ms, and the Sonic times were compared to the seismic checkshot times.

B. Drift Corrections

The difference between seismic times and integrated Sonic times (drift), was calculated for each checkshot station. These drift values were plotted versus depth, and the corrections applied were determined by using the optimum broken line plotted through the drift points.

At each slope change, depths (below KB) and drift values were picked. In order to adjust the Sonic times to match the seismic times, the following corrections were used:

DEPTH(ft) below KB	DRIFT CORRECTION(msec) added to Sonic time
1100	0
2020	0
2540	-4
6489.5	-6
6499.9	-6

C. Results

The resulting Drift Plot and continuous velocity log (CVL) are presented on Plate SYN-1. The plot labeled "CHECKSHOTS" presents the Sonic log as a velocity log, scaled from 5000 to 20,000 ft/sec on a logarithmic grid. The plot has a linear time scale (two-way time), and the corresponding depth scale is presented on the far left. In addition, the checkshots are located on the plot according to: vertical depth below KB, vertical seismic time below datum plane (DP), and adjusted Sonic time below DP. The checkshots presented are the eleven that fall within the Sonic log depths.

The other half of Plate SYN-1 is the final Drift Plot, with the drift value at each checkshot indicated by a small "+". The broken line shows the actual value of drift added to the Sonic time at each depth.

Plate SYN-2 serves to compile all the various velocity functions, plotted with a linear depth scale. At the far left of Plate SYN-2 the checkshot stations and one formation top are located by depth. Then we have five curves describing various parameters. Starting from the left side, the first curve is a plot of the integrated, adjusted CVL with a linear velocity scale from 2000 to 30,000 ft/sec. Next is a plot of the Sonic log integration, or the time traveled at every depth. The last three curves show the average

velocity, the RMS velocity, and the interval velocity between stations.

Plate SYN-3 is a compilation of the wireline logs used plus the adjusted CVL, acoustic impedance, and reflecting power curves, all plotted with a linear depth scale.

To complement this is Plate SYN-4, which shows the wireline logs plus the velocity and acoustic impedance curves plotted with a linear time scale.

D. The Synthetic

The computation of a Synthetic Seismogram assumes that:

- the source and receiver are situated at the same point on the surface,
- the layers are horizontal,
- the waves are plane and horizontal at the point where they reach the surface.

The Synthetic Seismogram represents the sequence of reflection coefficients "K" computed with the following formula:

$$K = \frac{\rho_1 v_1 - \rho_2 v_2}{\rho_1 v_1 + \rho_2 v_2}$$

where ρ = density and v = velocity of layers 1 and 2. If the density is not available, d is taken as a constant.

With this formula an increase in acoustic impedance from layer 1 to layer 2 corresponds to a negative K, so in order to agree with S.E.G. polarity standards, the traces are reversed. Therefore, on Plates SYN-5 the "direct polarity" traces show an increase in acoustic impedance as a positive peak, agreeing with the S.E.G. polarity conventions.

The Synthetic Seismogram with multiples is computed with the surface as the origin of all times. Then the necessary correction is applied so that Plates SYN-5 show zero time at the datum plane of 2600 feet, to correlate with the seismic section and velocity survey.

On Plates SYN-5, the traces with direct polarity are presented on the left and those with reverse polarity are on the right. SSK refers to the Synthetic traces without multiples, and the traces labeled SSM have multiples included. Different values of surface reflection coefficients are used for computation of the Synthetic Seismogram with multiples. Here we used K = 0.0 and K = -.5, the first giving no surface multiples, and the second giving fairly strong surface multiples. Internal multiples (pegleg and interbed) are the same on all SSM plots.

Finally, the SSK and SSM traces are convolved with four different operators: "i" refers to the impulsional (or unfiltered) trace, S1 used a (7,15,35,47) Hz, S2 used a (10,15,50,60) Hz, and S3 used a (10,15,70,85) Hz zero-phase bandpass filter. Eight traces of each convolution are presented as "wiggle" traces with shading on the peaks. For this survey, Plate SYN-5a is a full-scale plot with a 5 in/sec time scale, and SYN-5b is plotted at half-scale, or 2.5 in/sec.

Plate SYN-6 presents the Sonic and Density logs, one trace of each convolution, and eight "wiggle" traces of the convolutions.

Again, the datum plane at 2600 feet occurs at zero time. On the left of SYN-6 are the wavelets and amplitude spectra of the filters used. In addition, one formation top is labeled at its proper depth.

Plate SYN-7 is simply a comparison of one trace of each convolution with and without automatic volume control (AVC). This AVC is a gain applied to bring up the amplitude of the multiples. Below each set of traces is a plot of the gain in dB applied to the multiples. For this Synthetic, a large gain was applied, because the multiple reflections were very weak to begin with.

E. Computer Listings of Results

Appendix 3 consists of two computer printouts. The first, titled "Velocity Survey Computation Forms", is the result of the vertical time computation. The column labeled "DGR" is the depth below KB of each checkshot. Column "T" shows the time picked for the first break. This is multiplied by the "COS" of the angle between vertical and the actual source location to give "T2". Finally we add "TI" to adjust the seismic times back to the datum plane, taking into account the instrument delay and signature probe delays. This resultant vertical time is listed in column "T3", and the average seismic time (when more than one measurement was made on a level) is listed in column "T3M". "T3M" values are the vertical seismic times to which the Sonic times were corrected.

The second computer printout, titled "Listings of Results", comes from the final Synthetic computation. First we have the formulae for drift corrections as well as the drift values used and the resulting corrected Sonic times. The rest of the printout shows the depth, velocity, and "K" (reflection coefficient) values for every millisecond, one-way time. Finally, the two tables at the very end

give the depths, times and velocities at the checkshot stations. The value of "E" is the remaining difference between seismic and Sonic times after all the corrections have been applied. This number is our last quality check on our corrections, and we see that "E" is very close to zero, within one or two milliseconds.

PART THREE: COMMMENTS AND CONCLUSIONS

The S/N ratio was particularly good on the first arrivals. The processing and display of the seismic traces "VSP fashion" led to the observation of reflections at 580 ms (3650 feet) and 545 ms (6100 feet). A downgoing reflection is observed at 175 ms below DP.

The upgoing reflections can be used to tie the checkshot data directly to the CDP data.

FIGURE 1

NORMALIZED RAW DATA OF CHECKSHOTS

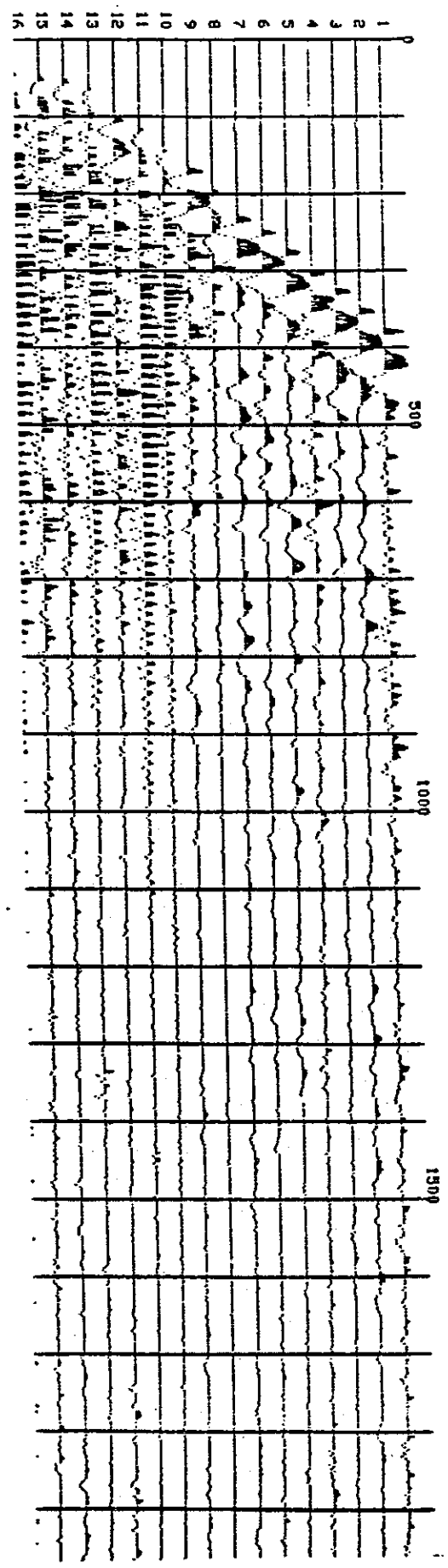


FIGURE 2

EQUALIZED RAW DATA OF CHECKSHOTS

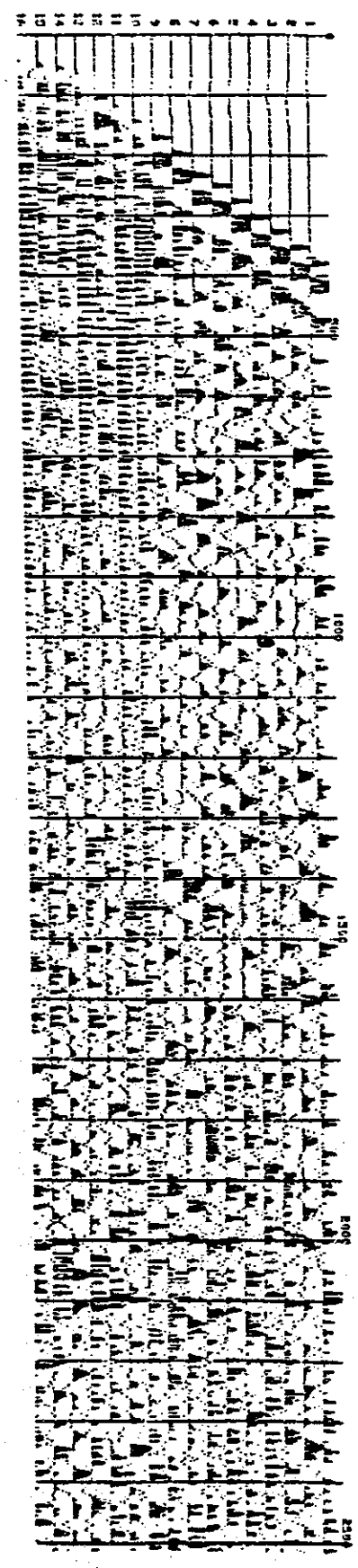


FIGURE 3a

NORMALIZED DISPLAY OF SIGNATURE PROBE
ON GROUND BESIDE BELL

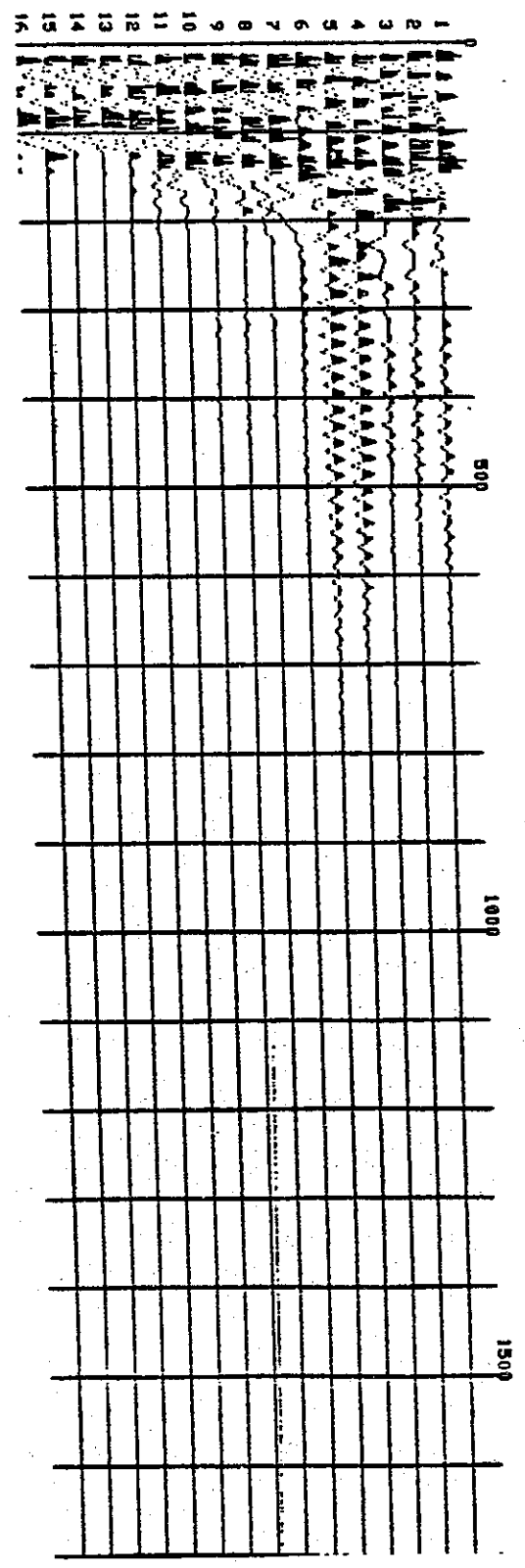


FIGURE 3b

NORMALIZED DISPLAY OF SIGNATURE PROBE
4 FEET BELOW GUN BELL

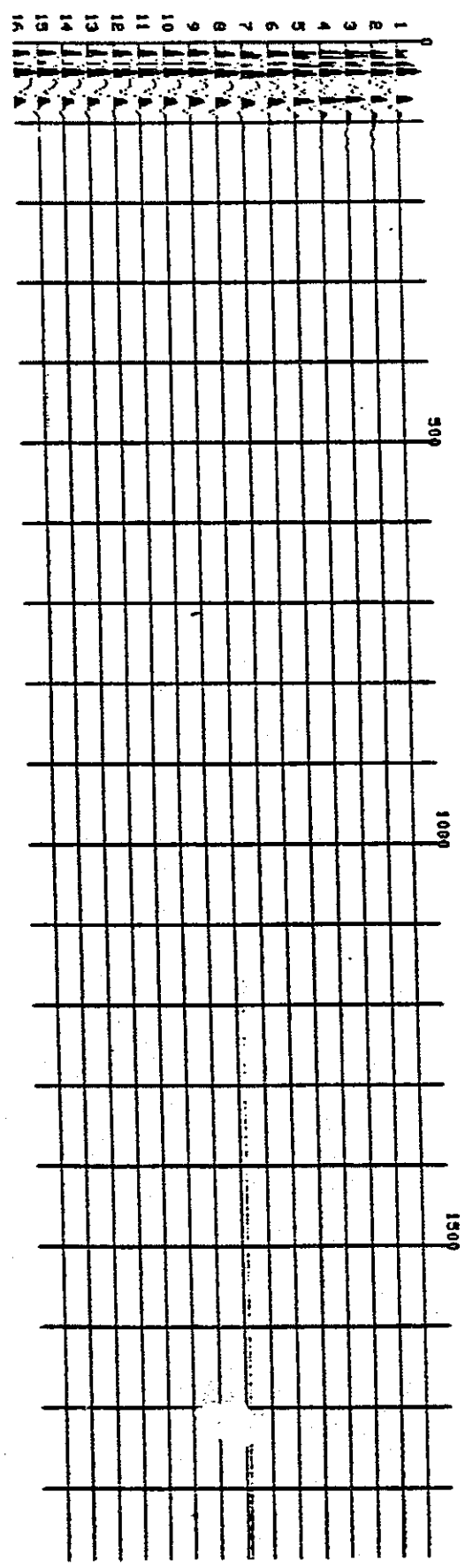


FIGURE 4

FREQUENCY ANALYSIS OF FIRST ARRIVALS

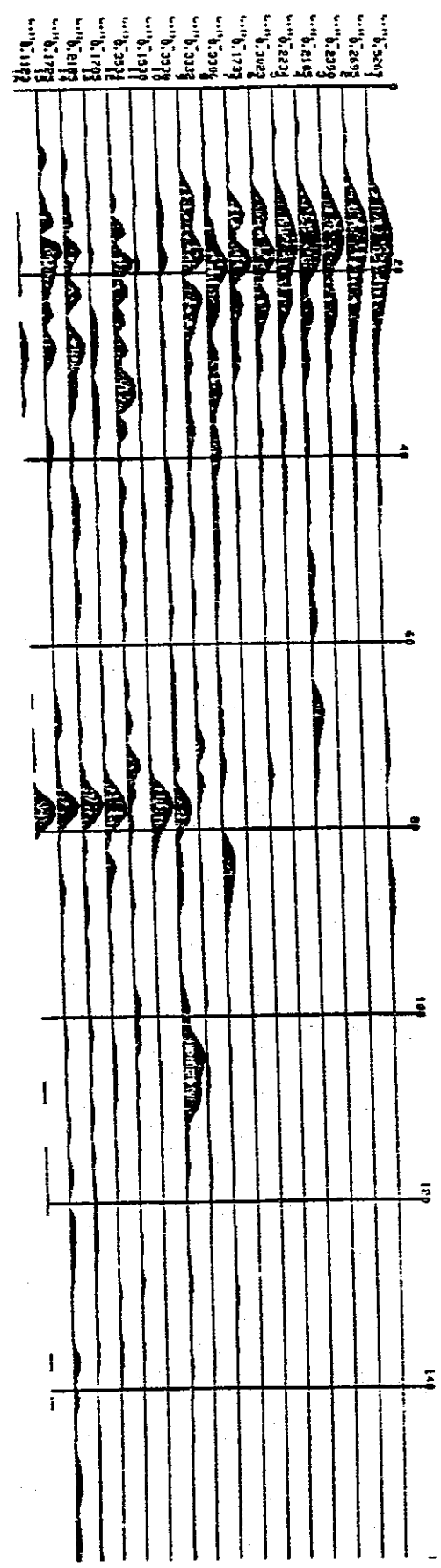
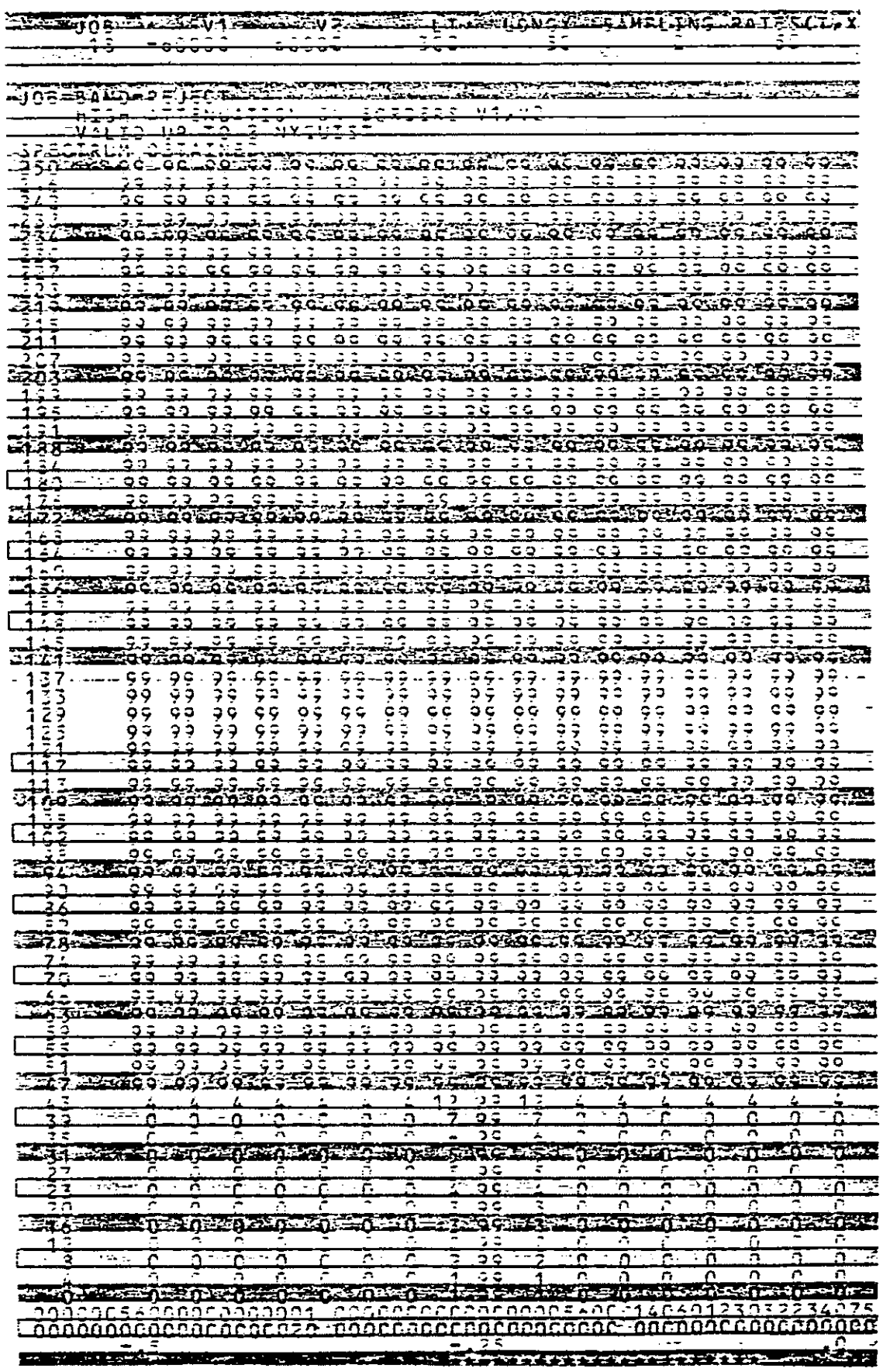


FIGURE 5

F-K FILTER



LIST OF SYMBOLS

for

Velocity Survey Computation Forms

DP:	Datum plane elevation (origin of times)
R:	Rotary table or kelly bushing elevation (origin of depths)
GL:	Ground level elevation
H0-H1-H2:	Thicknesses of weathering zones
V0-V1-V2:	Velocities of weathering zones
VC:	Correction velocity used from GL to DP
C:	Time difference from GL to DP (using VC)
DG:	Downhole station depth below R
DGDP:	Downhole station depth below DP
N:	Field record number
SP:	Source position number
SPE:	Source position elevation
DS:	Depth of bottom of source below GL
D:	Source offset from the well
H:	Vertical depth from source to downhole station
COS:	Cosine of angle between vertical and source location
T:	First break time pick from signature probe to downhole station
T2:	Vertical time from signature probe to downhole station
TI:	Time correction from signature probe to DP
T3:	Vertical seismic time from DP to downhole station
ST:	Sonic time
DFT:	Drift (T3 - ST)
IV:	Interval velocity between stations
AV:	Average velocity from DP
T3M:	Average vertical seismic time
DM:	Average drift (T3M - ST)

LIST OF SYMBOLS

for

Listing of Results

DELTA T:	Sampling interval (milliseconds one-way time)
TAU:	Calculation interval (milliseconds one-way time)
H:	Depth difference from KB to GL
S:	CVL depth unit conversion coefficient
ZO:	Depth below GL of first sample of CVL
THO:	Time corresponding to ZO
DFT:	Drift (seismic time minus Sonic time)
DT DFT:	Difference in drift
ZKB:	Depth below KB (used for drift calculation)
DZ:	Difference in ZKB
AST:	Adjusted Sonic time (after drift correction)
DTA:	Difference in AST
DTMIN:	Minimum travel time found on Sonic log
T:	Time below DP
DKB:	Depth below KB
DDP:	Depth below DP
IV:	Interval-velocity between samples
K:	Reflection coefficient
VAV:	Average velocity from DP
VRMS:	RMS velocity from DP
DT:	Theoretical normal moveout for seismic spread of length x
ALPHA:	Attenuation coefficient
DENS:	Bulk density (grams/cc)
T3M:	Average vertical seismic time
DM:	Drift (T3M - ST)
AVST:	Adjusted vertical Sonic time
E:	Final difference in time (T3M - AVST)
AV:	Average velocity from DP

PHILLIPS
NOVEMBER 11, 1982

KIRKLAND

VELOCITY SURVEY COMPUTATION FORMS
IN DENVER - U.S.A.

PARAMETERS

DP	=	2500.0
R	=	1541.0
GL	=	3528.0
MO	=	0.0
VO	=	12094.0
M1	=	0.0
V1	=	0.0
M2	=	0.0
V2	=	0.0
VC	=	12094.0

LENGTH UNIT = FEET

UNCORRECTED TIMES TO GL = UCT
UCT = T3 + C

C = 85.0

DGR	DGDP	N	SP	SPE	DS	D	H	COS	T	T2	T1	T3	ST	DFT	IV	AV	T3M	D
200	-343	23		3628.0	0	7C	185	.9343	40.0	37.4	-85.0	-47.6			17747	17747	-47.6	
300	-743	27		3628.0	0	7C	285	.9707	43.0	41.7	-85.0	-43.3			23256	17199	-43.3	
400	-643	26		3623.0	0	7C	385	.9836	49.C	48.2	-85.0	-36.8			15385	17520	-36.8	
500	-543	25		3628.0	0	7C	485	.9996	52.0	51.5	-85.0	-33.5			30303	16257	-33.5	
1285 1235	243 242	24 23		3628.0 3628.0	0 0	7C 7C	1270 1270	.9985 .9983	100.C 100.0	99.8 99.6	-85.C -85.5	14.8 14.7			16236	16351	14.8	
1510 1510	427 427	22 21		3626.0 3628.0	0 0	7C 7C	1495 1495	.9989 .9989	112.C 112.0	111.9 111.9	-85.0 -85.0	26.9 26.9			18595	17361	26.9	
2000 2000	957 957	20 19		3628.0 3628.0	0 0	7C 7C	1995 1995	.9994 .9994	140.C 140.C	139.9 139.9	-85.C -85.0	54.9 54.9			17500	17432	54.9	

T3M = AVERAGE VERTICAL TIME DM = AVERAGE DRIFT * DOUBTFUL VALUE / CANCELLED VALUE

APPENDIX 3

PHILLIPS
NOVEMBER 11, 1982

KIRKLAND
(CONT.)
VELOCITY SURVEY COMPUTATION FORMS
IN DENVER - U.S.A.

PARAMETERS
DP = 2500.0
R = 3643.0
GL = 3628.0
MO = 0.0
VO = 12094.0
M1 = 0.0
V1 = 0.0
M2 = 0.0
V2 = 0.0
VC = 12094.0

UNCORRECTED TIMES TO GL = UCT
UCT = T1 + C

C = 85.0

LENGTH UNIT = FEET

DGR	DSDP	N	SP	SPE	DS	D	H	COS	T	T2	TI	T3	ST	DFT	IV	AV	T3M	D
2500	1437	19		3628.0	0	7C	2485	.9956	163.0	162.9	-85.0	77.9			21739			
2500	1437	17		3628.0	0	7C	2485	.9956	163.0	162.9	-85.0	77.9				19703	77.9	
2980	1937	16		3628.0	0	7C	2965	.9957	190.0	189.9	-85.0	104.9			17778			
2980	1937	15		3628.0	0	7C	2965	.9957	190.0	189.9	-85.0	104.9				18465	104.9	
3652	3009	14		3628.0	0	7C	3637	.9998	226.0	226.0	-85.0	141.0			18615			
3652	3009	13		3628.0	0	7C	3637	.9998	226.0	226.0	-85.0	141.0				18504	141.0	
4000	2957	12		3628.0	0	7C	3985	.9998	244.0	244.0	-85.0	159.0			19333			
4000	2957	11		3628.0	0	7C	3985	.9998	244.0	244.0	-85.0	159.0				18597	159.0	
4490	3447	10		3628.0	0	7C	4475	.9999	270.0	270.0	-85.0	185.0			18846			
4490	3447	9		3628.0	0	7C	4475	.9999	270.0	270.0	-85.0	185.0				18632	185.0	
5000	3957	7		3628.0	0	7C	4985	.9999	298.0	298.0	-85.0	213.0			18214			
																18577	213.0	

T3M = AVERAGE VERTICAL TIME OM = AVERAGE DRIFT * DOUBTFUL VALUE / CANCELLED VALUE

APPENDIX 3 cont'd

PHILLIPS

NOVEMBER 11, 1982

KIRKLAND

(CONT.)

VELOCITY SURVEY COMPUTATION FORMS

IN DENVER - U.S.A.

PARAMETERS

OP	=	2500.0
R	=	3463.0
GL	=	3528.0
HU	=	0.0
VO	=	12094.0
H1	=	0.0
V1	=	0.0
H2	=	0.0
V2	=	0.0
VC	=	12094.0

UNCORRECTED TIMES TO GL = UCT

UCT = T3 + C

C = 85.0

LENGTH UNIT = FEET

DGR	DGOP	N	SP	SPE	DS	D	H	COS	T	T2	T1	T3	ST	DFT	IV	AV	T3M	D
															20833			
5500	4457	6		3623.0	0	70	5485	.9999	322.0	322.0	-85.0	237.0						
5500	4457	5		3629.0	0	70	5485	.9999	322.0	322.0	-85.0	237.0				18806	237.0	
															17857			
6000	4957	4		3623.0	0	70	5985	.9999	350.0	350.0	-85.0	265.0						
6000	4957	3		3629.0	0	70	5985	.9999	350.0	350.0	-85.0	265.0				18706	265.0	
															19608			
6500	5457	2		3628.0	0	70	6485	.9999	375.0	375.0	-85.0	290.0						
6500	5457	1		3628.0	0	70	6485	.9999	375.0	375.0	-85.0	291.0				18785	290.5	

T3M = AVERAGE VERTICAL TIME DM = AVERAGE DRIFT * DOUBTFUL VALUE / CANCELLED VALUE

APPENDIX 3 cont'd

LISTING OF RESULTS

WELL KICKLAND

COMPANY PHILLIPS

COUNTRY USA OF A

X SECTION 32

KB 3643

DF GL (3628)

COMPUTED IN DENVER-U.S.A.

APPENDIX 3 cont'd

```
UNITS
-DEPTH      =      FEET
-VELOCITY   =      FEET/SECOND
-TIME       =      MILLISECONDS (ONE WAY)

CALCULATION
DP =GL (3628)
VELOCITY BETWEEN THE SURFACE AND THE BEGINNING OF THE CYL = VS=12230.
VALUES OF PARAMETERS

DELTA T =   1.0
TAU     =   1.0
H       =  -15.0
S       =1.0000
IO      =  27.7
THO     =   1.0

CALCULATION BY FORMULA: K=(V1*D1+V2*D2)/(V1*D1+V2*D2)
```

APPENDIX 3 cont'd

ATT IS ADJUSTED TRANSIT TIME

CSTE AND DTMIN ARE EXPRESSED IN MICROSECONDS/ FEET

DFT	DT DFT	IKS	D2	AST	DTA	ST	DTS	DTMIN	CK	CSTE
0.0	0.0	1100.0	920.0	99.7	68.7					0.000
0.0	0.0	2020.0	520.0	140.8	140.9					-7.692
-4.0	-4.0	2540.0	3949.5	166.1	170.1	361.2				-.506
-5.0	-2.0	4469.5	10.4	375.2	361.2					0.000
-5.0	0.0	4699.9		375.7	381.7					

PERCENTAGE

CALIBRATION
CORRECTION FORMULAE

EITHER ATT = IT + CSTE WHERE IT = SAMPLED TRANSIT TIME
AND CSTE = (DT DFT)*1000 / D2

OR ATT = (IT-DTMIN)*CK + DTMIN WHERE CK = (DTA*1000-DTMIN*D2)/(DTS*1000-DTMIN*D2)

APPENDIX 3 cont'd

I	DKB	DDP	IV	K	VAV	VRMS	DT FOR X = 0.	0.	0.	ALPHA	DENS
1.0	27.2	12.2	12230.0	0.000	12230.0	12230.0	0.0	0.0	0.0	1.000	2.60
2.0	39.5	24.5	12230.0	-.000	12230.0	12230.0	0.0	0.0	0.0	1.000	2.60
3.0	51.7	36.7	12240.0	.000	12233.3	12233.3	0.0	0.0	0.0	1.000	2.60
4.0	63.9	48.9	12230.0	.000	12232.5	12232.5	0.0	0.0	0.0	1.000	2.60
5.0	76.2	61.2	12230.0	-.000	12232.0	12232.0	0.0	0.0	0.0	1.000	2.60
6.0	88.4	73.4	12230.0	-.000	12231.7	12231.7	0.0	0.0	0.0	1.000	2.60
7.0	100.6	85.6	12240.0	.000	12232.9	12232.9	0.0	0.0	0.0	1.000	2.60
8.0	112.9	97.9	12230.0	0.000	12232.5	12232.5	0.0	0.0	0.0	1.000	2.60
9.0	125.1	110.1	12230.0	.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
10.0	137.3	122.3	12230.0	-.000	12232.0	12232.0	0.0	0.0	0.0	1.000	2.60
11.0	149.6	134.6	12230.0	-.000	12231.8	12231.6	0.0	0.0	0.0	1.000	2.60
12.0	161.8	146.8	12240.0	.000	12232.5	12232.5	0.0	0.0	0.0	1.000	2.60
13.0	174.0	159.0	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
14.0	186.3	171.3	12230.0	0.000	12232.1	12232.1	0.0	0.0	0.0	1.000	2.60
15.0	198.5	183.5	12230.0	-.000	12232.0	12232.0	0.0	0.0	0.0	1.000	2.60
16.0	210.7	195.7	12240.0	.000	12232.5	12232.5	0.0	0.0	0.0	1.000	2.60
17.0	223.0	208.0	12230.0	-.000	12232.4	12232.4	0.0	0.0	0.0	1.000	2.60
18.0	235.2	220.2	12230.0	.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
19.0	247.4	232.4	12230.0	0.000	12232.1	12232.1	0.0	0.0	0.0	1.000	2.60
20.0	259.6	244.6	12230.0	-.000	12232.0	12232.0	0.0	0.0	0.0		

T	D4B	DDP	IV	K	VAV	VRMS	DT FOR X = 0.	0.	0.	ALPHA	DENS
21.0	271.9	256.9	12240.0	.000	12232.4	12232.4	0.0	0.0	0.0	1.000	2.60
22.0	284.1	269.1	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
23.0	296.3	281.3	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
24.0	308.6	293.6	12230.0	-.000	12232.1	12232.1	0.0	0.0	0.0	1.000	2.60
25.0	320.8	305.8	12240.0	.000	12232.4	12232.4	0.0	0.0	0.0	1.000	2.60
26.0	333.0	318.0	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
27.0	345.3	330.3	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
28.0	357.5	342.5	12230.0	-.000	12232.1	12232.1	0.0	0.0	0.0	1.000	2.60
29.0	369.7	354.7	12240.0	.000	12232.4	12232.4	0.0	0.0	0.0	1.000	2.60
30.0	382.0	367.0	12230.0	-.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
31.0	394.2	379.2	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
32.0	406.4	391.4	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
33.0	418.7	403.7	12230.0	-.000	12232.1	12232.1	0.0	0.0	0.0	1.000	2.60
34.0	430.9	415.9	12240.0	.000	12232.4	12232.4	0.0	0.0	0.0	1.000	2.60
35.0	443.1	428.1	12230.0	-.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
36.0	455.4	440.4	12230.0	.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
37.0	467.6	452.6	12230.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
38.0	479.8	464.8	12240.0	.000	12232.4	12232.4	0.0	0.0	0.0	1.000	2.60
39.0	492.1	477.1	12230.0	-.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
40.0	504.3	489.3	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60

APPENDIX 3 cont'd

T	DKB	DGP	IV	K	VAV	VRMS	DT FOR X = 0.	0.	0.	ALPHA	DENS
41.0	516.5	501.5	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
42.0	528.8	513.8	12230.0	-.000	12232.1	12232.1	0.0	0.0	0.0	1.000	2.60
43.0	541.0	526.0	12240.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
44.0	553.2	538.2	12230.0	0.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
45.0	565.3	550.5	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
46.0	577.7	562.7	12230.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
47.0	589.9	574.9	12240.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
48.0	602.2	587.2	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
49.0	614.4	599.4	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
50.0	626.6	611.6	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
51.0	638.8	623.8	12230.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
52.0	651.1	636.1	12240.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
53.0	663.3	648.3	12230.0	0.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
54.0	675.5	660.5	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
55.0	687.8	672.8	12230.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
56.0	700.0	685.0	12240.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
57.0	712.2	697.2	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
58.0	724.5	709.5	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
59.0	736.7	721.7	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
60.0	748.9	733.9	12230.0	-.000	12232.2	12232.2	0.0	0.0	0.0		

APPENDIX 3 cont'd

T	DKB	DOP	IV	K	VAV	VRMS	0.	DT FOR X = 0.	0.	ALPHA	DENS
61.0	761.2	746.2	12240.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
62.0	773.4	758.4	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
63.0	785.6	770.6	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
64.0	797.9	782.9	12230.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
65.0	810.1	795.1	12240.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
66.0	822.3	807.3	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
67.0	834.6	819.6	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
68.0	846.8	831.8	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
69.0	859.0	844.0	12240.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
70.0	871.3	856.3	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
71.0	883.5	868.5	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
72.0	895.7	880.7	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
73.0	908.0	893.0	12240.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
74.0	920.2	905.2	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
75.0	932.4	917.4	12230.0	-.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
76.0	944.7	929.7	12230.0	.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
77.0	956.9	941.9	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
78.0	969.1	954.1	12240.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
79.0	981.4	966.4	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
80.0	993.6	978.6		.000	12232.3	12232.3	0.0	0.0	0.0		

APPENDIX 3 cont'd

T	DX9	DDP	IV	K	VAV	VRMS	C.	DT FOR X	C.	ALPHA	DENS
81.0	1035.5	990.9	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
82.0	1018.0	1003.0	12230.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
83.0	1030.3	1015.3	12240.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
84.0	1042.5	1027.5	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
85.0	1054.7	1039.7	12230.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
86.0	1067.0	1052.0	12230.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
87.0	1079.2	1064.2	12240.0	-.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
88.0	1100.0	1085.0	20790.0	-.254	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
89.0	1117.9	1102.9	17860.0	.074	12329.5	12362.9	0.0	0.0	0.0	.933	2.60
90.0	1136.1	1121.1	18270.0	0.000	12391.7	12436.1	0.0	0.0	0.0	.923	2.61
91.0	1153.9	1138.9	17700.0	.016	12457.0	12517.9	0.0	0.0	0.0	.928	2.61
92.0	1170.8	1155.8	16990.0	.024	12514.6	12586.4	0.0	0.0	0.0	.928	2.62
93.0	1188.3	1173.3	17480.0	-.016	12563.3	12642.5	0.0	0.0	0.0	.927	2.60
94.0	1205.6	1190.6	17320.0	.013	12616.1	12704.3	0.0	0.0	0.0	.927	2.61
95.0	1219.7	1204.7	14030.0	.130	12666.2	12762.2	0.0	0.0	0.0	.927	2.56
96.0	1234.3	1219.3	14690.0	-.020	12680.5	12776.2	0.0	0.0	0.0	.911	2.44
97.0	1248.5	1233.5	14190.0	.013	12701.5	12797.0	0.0	0.0	0.0	.911	2.42
98.0	1266.0	1251.0	17480.0	-.131	12716.8	12312.8	0.0	0.0	0.0	.910	2.42
99.0	1282.7	1267.7	16650.0	.023	12765.4	12860.9	0.0	0.0	0.0	.895	2.56
100.0	1299.0	1284.0	16900.0	-.011	12804.6	12912.7	0.0	0.0	0.0	.894	2.56
				-.002	12845.6	12958.6			0.0	.894	2.58

APPENDIX 3-cont'd

APPENDIX 3-cont'd

T	DX9	DDP	IV	K	VAV	VRMS	DT FOR K C.	C.	C.	ALPHA	DENS
81.0	1035.6	990.9	12230.0	0.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
82.0	1018.0	1003.0	12230.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
83.0	1030.3	1015.3	12240.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
84.0	1042.5	1027.5	12230.0	.000	12232.3	12232.3	0.0	0.0	0.0	1.000	2.60
85.0	1054.7	1039.7	12230.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
86.0	1067.0	1052.0	12230.0	-.000	12232.2	12232.2	0.0	0.0	0.0	1.000	2.60
87.0	1079.2	1064.2	12240.0	-.255	12232.3	12232.3	0.0	0.0	0.0	.933	2.60
88.0	1100.0	1085.0	20790.0	.074	12329.5	12362.9	0.0	0.0	0.0	.923	2.61
89.0	1117.9	1102.9	17860.0	0.006	12391.7	12436.1	0.0	0.0	0.0	.923	2.61
90.0	1136.1	1121.1	18270.0	.016	12457.0	12517.9	0.0	0.0	0.0	.928	2.62
91.0	1153.9	1138.8	17700.0	.024	12514.6	12586.4	0.0	0.0	0.0	.927	2.60
92.0	1170.8	1155.8	16990.0	-.016	12563.3	12642.5	0.0	0.0	0.0	.927	2.61
93.0	1188.3	1173.3	17480.0	.013	12616.1	12704.3	0.0	0.0	0.0	.927	2.56
94.0	1205.6	1190.6	17320.0	.130	12666.2	12762.2	0.0	0.0	0.0	.911	2.44
95.0	1219.7	1204.7	14030.0	-.020	12680.5	12776.2	0.0	0.0	0.0	.911	2.42
96.0	1234.3	1219.3	14690.0	.013	12701.5	12797.6	0.0	0.0	0.0	.910	2.42
97.0	1248.5	1233.5	14190.0	-.131	12716.8	12812.8	0.0	0.0	0.0	.895	2.56
98.0	1266.0	1251.0	17480.0	.023	12765.4	12868.9	0.0	0.0	0.0	.894	2.56
99.0	1282.7	1267.7	16650.0	-.011	12804.6	12912.7	0.0	0.0	0.0	.894	2.58
100.0	1299.6	1284.6	16900.0	-.002	12845.6	12958.6	0.0	0.0	0.0		

eliminate this one!!

T	DKB	DCP	IV	K	VAV	VRMS	0.	OT FOR X = 0.	0.	ALPHA	DENS
101.0	1316.4	1301.4	16790.0	.003	12884.7	13002.1	0.0	0.0	0.0	.894	2.61
102.0	1332.9	1317.9	16590.0	.004	12921.0	13042.1	0.0	0.0	0.0	.894	2.62
103.0	1349.4	1334.4	16470.0	.016	12955.4	13079.7	0.0	0.0	0.0	.894	2.62
104.0	1365.4	1350.4	16000.0	-.057	12984.7	13110.8	0.0	0.0	0.0	.894	2.61
105.0	1383.4	1369.4	17990.0	.061	13032.4	13165.8	0.0	0.0	0.0	.891	2.61
106.0	1399.6	1384.6	16170.0	-.029	13062.0	13197.4	0.0	0.0	0.0	.888	2.57
107.0	1416.8	1401.8	17190.0	-.026	13100.6	13240.3	0.0	0.0	0.0	.887	2.56
108.0	1434.6	1419.6	17840.0	-.008	13144.4	13290.2	0.0	0.0	0.0	.886	2.60
109.0	1452.6	1437.6	17960.0	.016	13188.6	13340.4	0.0	0.0	0.0	.886	2.62
110.0	1470.2	1455.2	17600.0	-.013	13228.7	13385.3	0.0	0.0	0.0	.886	2.59
111.0	1488.1	1473.1	17910.0	.030	13270.9	13432.8	0.0	0.0	0.0	.886	2.61
112.0	1505.1	1490.1	17020.0	-.056	13304.4	13469.1	0.0	0.0	0.0	.885	2.59
113.0	1523.8	1508.8	18720.0	.013	13352.5	13524.5	0.0	0.0	0.0	.882	2.63
114.0	1542.1	1527.1	18290.0	.088	13395.6	13573.6	0.0	0.0	0.0	.882	2.63
115.0	1557.6	1542.6	15460.0	-.086	13413.6	13591.1	0.0	0.0	0.0	.875	2.60
116.0	1575.8	1560.8	18260.0	-.005	13455.3	13638.2	0.0	0.0	0.0	.869	2.62
117.0	1594.2	1579.2	18330.0	-.010	13497.0	13685.1	0.0	0.0	0.0	.869	2.62
118.0	1612.6	1597.8	18650.0	.003	13540.7	13734.7	0.0	0.0	0.0	.869	2.63
119.0	1631.4	1616.4	18570.0	-.005	13582.9	13782.4	0.0	0.0	0.0	.869	2.63
120.0	1650.1	1635.1	18730.0	.008	13625.8	13831.0	0.0	0.0	0.0	.869	2.63

APPENDIX 3 cont'd

T	DKB	DDP	IV	K	VAV	VRMS	DT FOR X 0.	0.	0.	ALPHA	DENS
121.0	1668.5	1653.5	18390.0	-.001	13665.2	13874.8	0.0	0.0	0.0	.869	2.63
122.0	1686.9	1671.9	18410.0	-.007	13704.1	13916.0	0.0	0.0	0.0	.869	2.64
123.0	1705.6	1690.6	18730.0	-.001	13745.0	13963.8	0.0	0.0	0.0	.869	2.63
124.0	1724.4	1709.4	18760.0	-.002	13785.4	14009.0	0.0	0.0	0.0	.869	2.63
125.0	1743.2	1728.2	18810.0	.008	13825.6	14053.9	0.0	0.0	0.0	.869	2.63
126.0	1761.6	1746.6	18360.0	.003	13861.6	14093.3	0.0	0.0	0.0	.869	2.66
127.0	1780.0	1765.0	18440.0	-.001	13897.6	14132.5	0.0	0.0	0.0	.869	2.63
128.0	1798.5	1783.5	18530.0	-.013	13933.8	14172.4	0.0	0.0	0.0	.869	2.62
129.0	1817.4	1802.4	18900.0	-.000	13972.3	14215.1	0.0	0.0	0.0	.869	2.63
130.0	1836.3	1821.3	18910.0	.006	14010.3	14257.1	0.0	0.0	0.0	.869	2.64
131.0	1854.8	1839.8	18440.0	-.003	14044.1	14293.7	0.0	0.0	0.0	.868	2.67
132.0	1873.4	1858.4	18580.0	.013	14078.5	14331.0	0.0	0.0	0.0	.868	2.67
133.0	1891.7	1876.7	18360.0	.004	14110.7	14365.5	0.0	0.0	0.0	.868	2.63
134.0	1909.9	1894.9	18170.0	.005	14141.0	14397.6	0.0	0.0	0.0	.868	2.64
135.0	1928.0	1913.0	18130.0	.029	14170.5	14428.8	0.0	0.0	0.0	.868	2.62
136.0	1945.1	1930.1	17080.0	-.033	14191.9	14450.1	0.0	0.0	0.0	.868	2.63
137.0	1963.3	1948.3	18180.0	-.016	14221.0	14480.8	0.0	0.0	0.0	.867	2.63
138.0	1982.1	1967.1	16770.0	-.001	14254.0	14516.4	0.0	0.0	0.0	.866	2.63
139.0	2000.9	1985.9	18860.0	.029	14287.1	14552.3	0.0	0.0	0.0	.866	2.63
140.0	2018.8	2003.8	17900.0	-.094	14312.9	14578.9	0.0	0.0	0.0	.866	2.61

APPENDIX 3 cont'd

APPENDIX 3 cont'd

I	DKB	CDP	IV	K	VAV	VRMS	O.	OT FOR K = O.	O.	ALPHA	DENS
141.0	2040.4	2025.4	21565.7	0.000	14354.4	14640.2	0.0	0.0	0.0	.858	2.62
142.0	2041.9	2046.9	21572.3	.001	14415.0	14700.3	0.0	0.0	0.0	.859	2.63
143.0	2043.5	2063.5	21049.6	.011	14455.0	14754.4	0.0	0.0	0.0	.858	2.63
144.0	2045.6	2089.6	22325.1	-.055	14510.9	14812.5	0.0	0.0	0.0	.855	2.77
145.0	2126.9	2111.9	23201.2	-.049	14564.4	14377.3	0.0	0.0	0.0	.853	2.94
146.0	2150.1	2135.1	19221.7	.126	14624.0	14950.1	0.0	0.0	0.0	.840	2.75
147.0	2169.3	2154.3	15273.1	.053	14655.3	14983.4	0.0	0.0	0.0	.837	2.60
148.0	2187.6	2172.6	19717.6	-.040	14679.7	15008.0	0.0	0.0	0.0	.836	2.61
149.0	2207.3	2192.3	20685.2	-.016	14713.6	15044.6	0.0	0.0	0.0	.836	2.58
150.0	2228.0	2213.0	20443.2	.005	14753.4	15099.2	0.0	0.0	0.0	.836	2.58
151.0	2248.4	2233.4	20560.3	-.005	14791.0	15130.8	0.0	0.0	0.0	.835	2.59
152.0	2269.0	2254.0	21639.2	-.031	14829.1	15173.1	0.0	0.0	0.0	.835	2.62
153.0	2290.7	2275.7	22341.1	-.036	14873.6	15224.3	0.0	0.0	0.0	.834	2.73
154.0	2313.0	2298.0	21540.0	.039	14922.1	15281.2	0.0	0.0	0.0	.832	2.62
155.0	2334.5	2319.5	22018.7	-.012	14964.4	15329.7	0.0	0.0	0.0	.832	2.63
156.0	2354.6	2341.0	20329.5	.003	15010.0	15381.9	0.0	0.0	0.0	.832	2.81
157.0	2376.9	2361.9	17488.3	.096	15044.2	15418.8	0.0	0.0	0.0	.825	2.64
158.0	2394.9	2379.8	16442.5	-.016	15062.2	15435.7	0.0	0.0	0.0	.824	2.64
159.0	2413.3	2399.3	20534.8	-.053	15083.6	15456.6	0.0	0.0	0.0	.822	2.64
160.0	2433.8	2418.8		.020	15117.7	15493.5	0.0	0.0	0.0		

T	DK3	DDP	TV	K	VAV	VRMS	Q.	DT FOR X = CI	Q:	ALPHA	DENS
161.0	2453.6	2438.6	19743.3	-.010	15146.4	15523.5	0.0	0.0	0.0	.822	2.64
162.0	2473.7	2458.7	20166.6	-.021	15177.4	15556.4	0.0	0.0	0.0	.822	2.64
163.0	2494.8	2479.8	21012.1	.054	15213.2	15595.7	0.0	0.0	0.0	.821	2.64
164.0	2513.6	2498.6	18840.5	.025	15235.3	15617.5	0.0	0.0	0.0	.819	2.64
165.0	2531.5	2516.5	17569.8	-.030	15251.3	15632.1	0.0	0.0	0.0	.819	2.65
166.0	2550.5	2535.5	19050.8	0.000	15274.2	15655.0	0.0	0.0	0.0	.818	2.64
167.0	2566.9	2551.9	16279.6	-.034	15280.2	15656.8	0.0	0.0	0.0	.818	2.65
168.0	2584.2	2569.2	17401.7	-.050	15292.8	15669.7	0.0	0.0	0.0	.817	2.65
169.0	2603.5	2588.5	19273.6	-.007	15316.4	15693.5	0.0	0.0	0.0	.815	2.64
170.0	2623.0	2608.0	19558.6	.021	15341.3	15719.0	0.0	0.0	0.0	.815	2.64
171.0	2641.9	2626.8	18783.7	-.018	15361.5	15738.7	0.0	0.0	0.0	.814	2.64
172.0	2661.3	2646.3	19467.1	.004	15385.3	15762.9	0.0	0.0	0.0	.814	2.64
173.0	2680.5	2665.5	19249.5	.031	15407.7	15785.3	0.0	0.0	0.0	.814	2.64
174.0	2698.7	2683.7	18161.4	.008	15423.5	15799.9	0.0	0.0	0.0	.813	2.64
175.0	2716.7	2701.7	18054.8	-.010	15438.5	15813.7	0.0	0.0	0.0	.813	2.61
176.0	2735.1	2720.1	18341.3	-.020	15455.0	15829.2	0.0	0.0	0.0	.813	2.62
177.0	2754.0	2739.0	18962.0	-.010	15474.8	15848.7	0.0	0.0	0.0	.813	2.64
178.0	2773.3	2758.3	19285.1	.003	15496.2	15870.1	0.0	0.0	0.0	.813	2.64
179.0	2792.5	2777.5	19146.0	-.003	15516.6	15890.2	0.0	0.0	0.0	.813	2.65
180.0	2811.7	2796.7	19266.2	.004	15537.5	15911.0	0.0	0.0	0.0	.813	2.65

APPENDIX 3 cont'd

APPENDIX 3 cont'd

T	DXB	DDP	IV	K	VAV	VRMS	O.	OT FOR X O.	O.	ALPHA	DENS
121.0	2330.3	2315.8	19095.0	-.005	15557.1	15930.3	0.0	0.0	0.0	.813	2.65
152.0	2630.2	2635.2	19376.1	.003	15576.1	15951.3	0.0	0.0	0.0	.813	2.63
163.0	2669.5	2654.5	19305.7	-.005	15598.5	15971.5	0.0	0.0	0.0	.813	2.64
164.0	2829.0	2874.0	19457.6	.012	15619.4	15992.5	0.0	0.0	0.0	.812	2.64
165.0	2907.9	2892.9	19967.8	.008	15637.5	16010.1	0.0	0.0	0.0	.812	2.65
186.0	2926.6	2911.6	18639.7	-.003	15653.7	16025.4	0.0	0.0	0.0	.812	2.63
187.0	2945.6	2930.6	19024.7	-.002	15671.7	16042.9	0.0	0.0	0.0	.812	2.64
188.0	2964.7	2949.7	19081.2	-.005	15689.8	16060.6	0.0	0.0	0.0	.812	2.64
189.0	2983.5	2968.6	18906.2	.052	15706.9	16077.0	0.0	0.0	0.0	.809	2.63
190.0	3000.4	2955.4	16753.8	.061	15712.4	16080.5	0.0	0.0	0.0	.806	2.61
191.0	3015.3	3000.3	14950.3	-.023	15706.4	16075.0	0.0	0.0	0.0	.806	2.61
192.0	3031.0	3016.0	15679.1	-.037	15708.3	16072.9	0.0	0.0	0.0	.805	2.63
193.0	3047.7	3032.7	16746.4	-.016	15713.7	16076.5	0.0	0.0	0.0	.804	2.64
194.0	3064.9	3049.9	17196.0	-.037	15721.3	16082.4	0.0	0.0	0.0	.803	2.64
195.0	3083.4	3068.4	18499.9	-.005	15733.5	16095.8	0.0	0.0	0.0	.803	2.64
196.0	3102.1	3087.1	15688.8	.038	15750.6	16110.1	0.0	0.0	0.0	.802	2.65
197.0	3119.4	3104.4	17310.6	-.011	15758.5	16116.4	0.0	0.0	0.0	.802	2.65
198.0	3137.1	3122.1	17701.8	-.037	15768.3	16124.8	0.0	0.0	0.0	.801	2.66
199.0	3156.1	3141.1	18972.2	.001	15784.4	16140.3	0.0	0.0	0.0	.801	2.64
200.0	3175.2	3160.2	19053.9	.001	15800.8	16156.2	0.0	0.0	0.0	.801	2.64

APPENDIX 3 cont'd

T	OKS	DDP	IV	K	VAV	VRMS	DT FOR X C.	C.	C.	ALPHA	DENS
201.0	3194.2	3179.2	19028.9	-.003	15816.9	16171.6	0.0	0.0	0.0	.801	2.64
202.0	3213.3	3198.3	19128.7	-.009	15833.3	16187.7	0.0	0.0	0.0	.801	2.64
203.0	3232.8	3217.9	19447.0	-.002	15851.1	16205.4	0.0	0.0	0.0	.801	2.65
204.0	3252.3	3237.3	19496.4	.005	15868.9	16223.2	0.0	0.0	0.0	.801	2.65
205.0	3271.6	3256.6	19306.9	.001	15885.7	16239.6	0.0	0.0	0.0	.801	2.65
206.0	3290.8	3275.8	19249.5	-.001	15902.0	16255.0	0.0	0.0	0.0	.801	2.65
207.0	3310.1	3295.1	19258.7	-.005	15918.2	16271.4	0.0	0.0	0.0	.801	2.65
208.0	3329.6	3314.6	19504.3	-.001	15935.5	16288.5	0.0	0.0	0.0	.801	2.64
209.0	3349.1	3334.1	19562.3	-.001	15952.8	16305.7	0.0	0.0	0.0	.801	2.64
210.0	3368.7	3353.7	19597.0	.000	15970.2	16323.0	0.0	0.0	0.0	.801	2.66
211.0	3388.2	3373.2	19430.9	.007	15986.6	16339.1	0.0	0.0	0.0	.801	2.64
212.0	3407.5	3392.5	19321.1	-.001	16002.3	16354.4	0.0	0.0	0.0	.801	2.65
213.0	3426.8	3411.8	19266.3	-.002	16017.6	16369.3	0.0	0.0	0.0	.801	2.65
214.0	3446.1	3431.1	19312.0	-.002	16033.0	16384.3	0.0	0.0	0.0	.801	2.65
215.0	3465.3	3450.5	19404.1	-.011	16048.7	16399.6	0.0	0.0	0.0	.801	2.64
216.0	3484.6	3469.6	19076.9	.003	16062.7	16413.0	0.0	0.0	0.0	.801	2.64
217.0	3503.5	3488.5	18949.6	.003	16076.0	16425.6	0.0	0.0	0.0	.801	2.64
218.0	3522.4	3507.4	18853.7	.016	16088.8	16437.6	0.0	0.0	0.0	.800	2.61
219.0	3540.8	3525.8	18441.9	-.005	16099.5	16447.3	0.0	0.0	0.0	.800	2.61
220.0	3559.5	3544.5	18687.3	-.020	16111.3	16458.2	0.0	0.0	0.0		

T	DX3	CDP	IV	K	VAV	VRMS	D.	DT FOR X = 0.	D.	ALPHA	DENS
221.0	3578.7	3563.7	19235.4	-.003	16125.4	16471.6	0.0	0.0	0.0	.800	2.63
222.0	3598.1	3583.1	19347.7	-.001	16139.9	16485.9	0.0	0.0	0.0	.800	2.65
223.0	3617.4	3602.4	19302.3	-.002	16154.1	16499.6	0.0	0.0	0.0	.800	2.66
224.0	3636.7	3621.7	19307.4	.001	16168.2	16513.2	0.0	0.0	0.0	.800	2.64
225.0	3656.1	3641.1	19389.4	.004	16182.5	16527.1	0.0	0.0	0.0	.800	2.64
226.0	3675.3	3660.3	19269.5	.003	16196.2	16540.2	0.0	0.0	0.0	.800	2.66
227.0	3694.4	3679.4	19013.9	-.002	16208.6	16551.9	0.0	0.0	0.0	.800	2.64
228.0	3713.5	3698.5	19153.0	-.009	16221.5	16564.2	0.0	0.0	0.0	.800	2.65
229.0	3733.0	3718.0	19453.8	.000	16235.6	16577.9	0.0	0.0	0.0	.800	2.65
230.0	3752.4	3737.4	19468.2	.001	16249.7	16591.6	0.0	0.0	0.0	.800	2.65
231.0	3771.9	3756.9	19442.4	.001	16263.5	16605.0	0.0	0.0	0.0	.800	2.66
232.0	3791.3	3776.3	19382.7	.002	16276.9	16617.9	0.0	0.0	0.0	.800	2.65
233.0	3810.6	3795.6	19309.2	-.001	16290.0	16630.4	0.0	0.0	0.0	.800	2.67
234.0	3829.8	3814.8	19259.9	.030	16302.6	16642.5	0.0	0.0	0.0	.799	2.65
235.0	3848.1	3833.1	18276.9	-.011	16311.0	16649.8	0.0	0.0	0.0	.799	2.65
236.0	3866.8	3851.8	18664.6	-.020	16321.0	16658.9	0.0	0.0	0.0	.799	2.67
237.0	3886.1	3871.1	19321.3	-.001	16333.7	16671.0	0.0	0.0	0.0	.799	2.67
238.0	3905.4	3890.4	19308.6	.005	16346.2	16683.0	0.0	0.0	0.0	.799	2.66
239.0	3924.6	3909.6	19207.1	.045	16358.2	16694.3	0.0	0.0	0.0	.797	2.65
240.0	3942.2	3927.2	17635.0	.038	16353.5	16698.4	0.0	0.0	0.0		

APPENDIX 3 cont'd

I	DKB	CDP	IV	K	VAV	VRMS	DT FOR X = 0.	0.	ALPHA	DENS
241.0	3958.9	3943.9	16518.6	-.057	16364.5	16698.0	0.0	0.0	.795	2.61
242.0	3977.1	3962.1	18232.7	-.002	16372.2	16704.7	0.0	0.0	.794	2.67
243.0	3995.5	3980.5	18427.1	.003	16380.7	16712.1	0.0	0.0	.794	2.65
244.0	4013.3	3993.3	18304.7	-.016	16388.6	16718.9	0.0	0.0	.794	2.65
245.0	4032.6	4017.6	18759.3	-.012	16398.3	16727.8	0.0	0.0	.793	2.67
246.0	4051.3	4036.8	19189.4	-.003	16409.6	16738.5	0.0	0.0	.793	2.68
247.0	4071.1	4056.1	19355.7	-.010	16421.5	16749.9	0.0	0.0	.793	2.67
248.0	4090.5	4075.5	19378.3	.016	16433.5	16761.4	0.0	0.0	.793	2.72
249.0	4109.3	4094.8	19237.5	.001	16444.9	16772.3	0.0	0.0	.793	2.68
250.0	4129.0	4114.0	19225.3	.056	16456.0	16782.6	0.0	0.0	.793	2.69
251.0	4146.5	4131.5	17525.3	.041	16460.3	16785.8	0.0	0.0	.791	2.66
252.0	4163.0	4148.0	16431.5	-.033	16460.2	16784.4	0.0	0.0	.790	2.62
253.0	4180.5	4165.5	17568.7	-.031	16464.6	16787.6	0.0	0.0	.789	2.62
254.0	4199.1	4184.1	16518.6	-.010	16472.7	16794.8	0.0	0.0	.788	2.64
255.0	4217.8	4202.8	18723.6	.007	16481.5	16802.8	0.0	0.0	.788	2.67
256.0	4236.4	4221.4	18613.0	-.026	16489.8	16810.2	0.0	0.0	.789	2.65
257.0	4255.1	4240.1	18691.2	.041	16498.4	16817.9	0.0	0.0	.787	2.78
258.0	4273.1	4253.1	19027.2	.025	16504.3	16822.9	0.0	0.0	.786	2.66
259.0	4290.5	4275.5	17334.6	-.032	16507.6	16824.9	0.0	0.0	.786	2.63
260.0	4308.5	4293.5	16072.3	-.012	16513.6	16829.8	0.0	0.0	.785	2.69

T	DKB	DDP	IV	K	VAV	VRMS	DT FOR X = 0.	C.	D.	ALPHA	DENS
261.0	4327.2	4312.2	18686.3	-.009	16521.9	16837.4	0.0	0.0	0.0	.785	2.66
262.0	4346.3	4331.3	19029.8	-.003	16531.5	16846.3	0.0	0.0	0.0	.785	2.66
263.0	4365.3	4350.3	19063.6	.012	16541.1	16855.2	0.0	0.0	0.0	.785	2.68
264.0	4384.0	4369.0	18694.7	-.009	16549.3	16862.6	0.0	0.0	0.0	.785	2.66
265.0	4403.0	4388.0	19034.0	-.002	16558.7	16871.3	0.0	0.0	0.0	.785	2.66
266.0	4422.1	4407.1	19027.7	-.002	16567.9	16979.9	0.0	0.0	0.0	.785	2.67
267.0	4441.3	4426.3	19189.1	-.005	16577.8	16889.2	0.0	0.0	0.0	.785	2.66
268.0	4460.4	4445.4	19167.5	.009	16587.4	16899.2	0.0	0.0	0.0	.784	2.71
269.0	4479.5	4464.5	19050.7	-.043	16596.6	16906.7	0.0	0.0	0.0	.784	2.67
270.0	4499.2	4484.2	19739.3	-.032	16608.2	16918.1	0.0	0.0	0.0	.783	2.84
271.0	4519.5	4504.5	20250.0	.040	16621.7	16931.6	0.0	0.0	0.0	.782	2.95
272.0	4538.7	4523.7	19241.3	.050	16631.3	16940.7	0.0	0.0	0.0	.781	2.87
273.0	4557.3	4542.3	18564.3	-.010	16638.4	16946.9	0.0	0.0	0.0	.779	2.70
274.0	4576.2	4561.2	18910.5	.009	16646.7	16954.5	0.0	0.0	0.0	.779	2.70
275.0	4594.9	4579.9	18698.6	.003	16654.1	16961.2	0.0	0.0	0.0	.779	2.68
276.0	4613.6	4598.6	18728.4	-.019	16661.6	16967.9	0.0	0.0	0.0	.778	2.67
277.0	4633.0	4618.0	19363.9	.006	16671.4	16977.2	0.0	0.0	0.0	.778	2.68
278.0	4652.0	4637.0	19068.5	-.007	16680.0	16985.1	0.0	0.0	0.0	.778	2.68
279.0	4671.4	4656.4	19326.7	.001	16689.5	16994.1	0.0	0.0	0.0	.778	2.69
280.0	4690.7	4675.7	19303.4	.003	16698.8	17002.9	0.0	0.0	0.0	.778	2.68

APPENDIX 3 cont'd

T	DKB	DDP	TV	K	VAV	VRMS	DT FOR X = 0.	ALPHA = 0.	DENS
281.0	4709.9	4694.9	19230.7	-.002	16707.8	17011.6	0.0	.778	2.68
282.0	4729.2	4714.2	19326.1	-.000	16717.1	17020.1	0.0	.778	2.68
283.0	4748.5	4733.5	19304.0	.002	16726.5	17029.7	0.0	.778	2.68
284.0	4767.6	4752.8	19257.9	.004	16735.2	17037.1	0.0	.778	2.68
285.0	4786.9	4771.9	19149.3	.003	16743.7	17045.0	0.0	.778	2.68
286.0	4805.0	4791.0	19021.6	-.003	16751.6	17052.3	0.0	.778	2.67
287.0	4825.1	4812.1	19183.6	.004	16760.1	17060.2	0.0	.778	2.68
288.0	4844.1	4829.1	19950.2	.012	16767.7	17067.1	0.0	.779	2.67
289.0	4862.0	4847.0	18532.0	-.004	16773.8	17072.4	0.0	.779	2.66
290.0	4881.4	4866.4	18760.1	-.006	16780.7	17078.5	0.0	.778	2.68
291.0	4900.3	4885.3	18913.9	-.003	16786.0	17085.1	0.0	.778	2.69
292.0	4919.3	4904.3	18975.3	-.003	16795.5	17092.0	0.0	.778	2.69
293.0	4938.4	4923.4	19152.3	-.001	16803.5	17099.4	0.0	.773	2.70
294.0	4957.5	4942.5	19071.2	.003	16811.2	17106.5	0.0	.778	2.69
295.0	4976.5	4961.5	18987.6	-.003	16818.6	17113.2	0.0	.779	2.70
296.0	4995.0	4980.0	19062.2	.003	16826.2	17120.2	0.0	.778	2.69
297.0	5014.5	4999.5	18984.8	.006	16833.5	17126.8	0.0	.779	2.68
298.0	5033.3	5018.3	18812.1	-.012	16840.1	17132.7	0.0	.778	2.69
299.0	5052.6	5037.6	19223.7	.002	16848.1	17140.2	0.0	.778	2.69
300.0	5071.7	5056.7	19118.2	-.006	16855.6	17147.1	0.0	.778	2.69

APPENDIX 3 cont'd

APPENDIX 3 cont'd

T	DKB	DCP	IV	K	VAV	VRMS	0.	DT FOR X = 0.	0.	ALPHA	DENS
			19368.1							.778	2.69
301.0	5091.1	5076.1	19319.0	.000	16864.0	17155.0	0.0	0.0	0.0	.778	2.69
302.0	5110.4	5095.4	19195.8	.003	16872.1	17162.6	0.0	0.0	0.0	.778	2.69
303.0	5129.6	5114.6	19172.6	.001	16879.8	17169.7	0.0	0.0	0.0	.778	2.69
304.0	5148.7	5133.7	18840.9	.010	16887.3	17176.7	0.0	0.0	0.0	.778	2.68
305.0	5167.6	5152.6	18619.3	.008	16893.7	17182.4	0.0	0.0	0.0	.777	2.68
306.0	5186.2	5171.2	18891.4	-.009	16899.4	17187.3	0.0	0.0	0.0	.777	2.69
307.0	5205.1	5190.1	19186.0	-.003	16905.9	17193.1	0.0	0.0	0.0	.777	2.69
308.0	5224.3	5209.3	19179.7	-.000	16913.3	17200.0	0.0	0.0	0.0	.777	2.69
309.0	5243.5	5228.5	19225.7	-.002	16920.6	17206.7	0.0	0.0	0.0	.777	2.69
310.0	5262.7	5247.7	19039.7	.006	16928.0	17213.6	0.0	0.0	0.0	.777	2.69
311.0	5281.7	5266.7	18939.4	.004	16934.8	17219.8	0.0	0.0	0.0	.777	2.68
312.0	5300.7	5285.7	19208.6	-.008	16941.2	17225.6	0.0	0.0	0.0	.777	2.69
313.0	5319.9	5304.9	19162.6	-.002	16948.5	17232.3	0.0	0.0	0.0	.777	2.70
314.0	5339.0	5324.0	19072.4	-.022	16955.5	17238.8	0.0	0.0	0.0	.777	2.84
315.0	5358.1	5343.1	19127.7	.026	16962.3	17244.9	0.0	0.0	0.0	.776	2.69
316.0	5377.2	5362.2	19207.1	-.003	16969.1	17251.2	0.0	0.0	0.0	.776	2.70
317.0	5396.4	5381.4	19140.9	.005	16976.2	17257.7	0.0	0.0	0.0	.776	2.68
318.0	5415.6	5400.6	19096.2	-.001	16983.0	17264.0	0.0	0.0	0.0	.776	2.69
319.0	5434.7	5419.7	19039.7	.001	16989.6	17270.0	0.0	0.0	0.0	.776	2.69
320.0	5453.7	5438.7		.006	16996.0	17275.8	0.0	0.0	0.0		

I	DKB	DDP	IV	K	VAV	VRMS	C	DT FOR X = 0.	D	ALPHA	DENS
321.0	5472.7	5457.7	16930.2	-.004	17002.0	17281.2	0.0	0.0	0.0	.775	2.68
322.0	5491.6	5476.6	18966.0	-.004	17008.1	17286.7	0.0	0.0	0.0	.776	2.69
323.0	5510.7	5495.7	19122.3	.003	17014.7	17292.7	0.0	0.0	0.0	.776	2.69
324.0	5529.6	5514.3	19033.5	.027	17020.9	17298.3	0.0	0.0	0.0	.776	2.68
325.0	5548.0	5533.0	18175.4	.012	17024.5	17301.1	0.0	0.0	0.0	.776	2.67
326.0	5565.8	5550.8	17810.6	-.020	17026.9	17302.7	0.0	0.0	0.0	.776	2.65
327.0	5584.2	5569.2	16464.5	-.011	17031.3	17306.4	0.0	0.0	0.0	.775	2.67
328.0	5603.1	5588.1	19863.5	-.007	17036.9	17311.4	0.0	0.0	0.0	.775	2.67
329.0	5622.2	5607.2	19050.3	-.005	17043.0	17316.9	0.0	0.0	0.0	.775	2.68
330.0	5641.3	5626.3	19179.1	-.001	17049.5	17322.9	0.0	0.0	0.0	.775	2.68
331.0	5660.6	5645.0	19262.5	.011	17056.2	17329.1	0.0	0.0	0.0	.775	2.68
332.0	5679.4	5664.4	18802.3	.011	17061.5	17333.7	0.0	0.0	0.0	.775	2.69
333.0	5697.8	5682.8	18407.7	-.012	17065.5	17337.0	0.0	0.0	0.0	.775	2.68
334.0	5716.7	5701.7	18879.0	-.010	17070.9	17341.8	0.0	0.0	0.0	.775	2.69
335.0	5735.9	5720.9	19200.6	.011	17077.3	17347.7	0.0	0.0	0.0	.775	2.67
336.0	5754.3	5739.3	18928.7	-.003	17082.8	17352.6	0.0	0.0	0.0	.775	2.67
337.0	5773.3	5753.8	19006.7	-.002	17088.5	17357.7	0.0	0.0	0.0	.775	2.69
338.0	5792.8	5777.8	18992.4	.022	17094.1	17362.8	0.0	0.0	0.0	.774	2.66
339.0	5811.1	5796.1	18370.3	-.007	17097.8	17365.7	0.0	0.0	0.0	.774	2.67
340.0	5829.7	5814.7	18549.3	-.009	17102.1	17369.3	0.0	0.0	0.0		

T	DKB	DDP	IV	K	VAN	VRMS	DT FOR X			ALPHA	DENS
341.0	5848.6	5833.0	19373.7	.038	17107.2	17373.9	0.	0.	0.	.774	2.67
342.0	5866.1	5851.1	17491.9	.010	17108.4	17374.3	0.0	0.0	0.0	.773	2.67
343.0	5883.4	5868.4	17395.4	-.040	17109.2	17374.3	0.0	0.0	0.0	.773	2.67
344.0	5902.2	5887.2	19383.8	-.020	17113.9	17376.5	0.0	0.0	0.0	.771	2.68
345.0	5921.6	5906.6	19313.3	.004	17120.5	17384.5	0.0	0.0	0.0	.771	2.70
346.0	5940.9	5925.9	19266.1	.003	17126.8	17390.4	0.0	0.0	0.0	.771	2.68
347.0	5960.1	5945.1	19238.0	.001	17133.0	17396.1	0.0	0.0	0.0	.771	2.67
348.0	5979.4	5964.4	19196.9	.001	17139.0	17401.7	0.0	0.0	0.0	.771	2.68
349.0	5998.6	5983.6	19271.3	-.004	17144.9	17407.1	0.0	0.0	0.0	.771	2.69
350.0	6017.8	6002.8	19189.3	.001	17151.0	17412.7	0.0	0.0	0.0	.771	2.69
351.0	6037.0	6022.0	19099.3	.006	17156.6	17418.0	0.0	0.0	0.0	.771	2.67
352.0	6056.1	6041.1	19112.7	-.002	17162.3	17423.0	0.0	0.0	0.0	.771	2.68
353.0	6075.2	6060.2	18971.2	.007	17167.8	17428.1	0.0	0.0	0.0	.771	2.67
354.0	6094.2	6079.2	19258.8	-.010	17172.9	17432.6	0.0	0.0	0.0	.771	2.68
355.0	6113.5	6098.5	19415.0	-.004	17178.8	17436.0	0.0	0.0	0.0	.771	2.68
356.0	6132.9	6117.9	18733.4	.022	17185.1	17443.9	0.0	0.0	0.0	.771	2.66
357.0	6151.6	6136.6	19036.4	-.010	17189.4	17447.6	0.0	0.0	0.0	.770	2.67
358.0	6170.7	6155.7	19239.2	-.010	17194.6	17452.3	0.0	0.0	0.0	.770	2.69
359.0	6189.9	6174.9	19231.3	.004	17200.3	17457.5	0.0	0.0	0.0	.770	2.67
360.0	6209.1	6194.1		.003	17205.9	17462.7	0.0	0.0	0.0		

DT FOR X = 0.

T	DXB	DDP	TV	K	VAV	VRMS	0.	0.	0.	ALPHA	DENS
361.0	6228.3	6213.3	19134.1	-.006	17211.3	17467.5	0.0	0.0	0.0	.770	2.67
362.0	6247.6	6232.6	19314.8	-.007	17217.1	17472.9	0.0	0.0	0.0	.770	2.68
363.0	6267.0	6252.0	19383.4	.009	17223.0	17478.5	0.0	0.0	0.0	.770	2.71
364.0	6286.2	6271.2	19276.5	-.000	17228.7	17483.6	0.0	0.0	0.0	.770	2.67
365.0	6305.4	6290.4	19151.6	-.001	17234.0	17488.4	0.0	0.0	0.0	.770	2.69
366.0	6324.6	6309.6	19259.1	-.007	17239.4	17493.5	0.0	0.0	0.0	.770	2.68
367.0	6344.1	6329.1	19451.6	-.000	17245.5	17499.1	0.0	0.0	0.0	.770	2.69
368.0	6363.5	6348.5	19408.4	.007	17251.3	17504.6	0.0	0.0	0.0	.770	2.70
369.0	6382.7	6367.7	19198.7	-.008	17256.6	17509.4	0.0	0.0	0.0	.770	2.69
370.0	6402.2	6387.2	19505.2	.001	17262.7	17515.1	0.0	0.0	0.0	.770	2.69
371.0	6421.7	6406.7	19495.0	.005	17268.7	17520.7	0.0	0.0	0.0	.770	2.68
372.0	6441.1	6426.1	19377.9	-.001	17274.4	17526.0	0.0	0.0	0.0	.770	2.67
373.0	6460.4	6445.4	19330.2	-.001	17279.9	17531.1	0.0	0.0	0.0	.770	2.69
374.0	6479.5	6464.5	19356.1	.006	17285.4	17536.2	0.0	0.0	0.0	.770	2.69
375.0	6499.0	6484.0	19217.4	0.000	17290.6	17540.9	0.0	0.0	0.0	.770	2.67
376.0	6518.2	6503.2	19217.4	0.000	17295.7	17545.6	0.0	0.0	0.0	.770	2.67

END OF COMPUTATION

APPENDIX 3 cont'd

APPENDIX 3 cont'd

AFTER DRIFT CORRECTION
E = 13M-AVST

RESULTS

VELOCITY SURVEY

KIRKLAND

DKB	DDP	13M	ST	DM	AVST	IV	S
	0.0	0.0					
1295.0	1270.0	99.8	99.8	0.0	99.1	12815.3	.7
1510.0	1495.0	111.9	113.0	-1.1	112.3	17645.5	-.4
2000.0	1985.0	139.9	139.7	.2	139.0	14352.1	-.9
2500.0	2485.0	162.9	167.7	-4.8	163.3	20576.1	-.4
2990.0	2965.0	189.9	193.7	-3.8	183.8	13423.5	1.1
3492.0	3437.0	226.0	230.0	-4.0	224.8	13466.7	1.2
4000.0	3985.0	244.0	248.6	-4.5	243.2	14913.0	.8
4490.0	4475.0	270.0	275.2	-5.2	269.5	18631.2	.5
5000.0	4985.0	298.0	302.1	-4.1	296.2	19101.1	1.8
5500.0	5485.0	322.0	328.6	-6.6	322.4	19084.0	-.4
6000.0	5935.0	350.0	355.5	-5.5	349.1	18726.6	.9
6499.5	6476.5	375.5	381.2	-5.7	374.5	19271.7	1.0

GEOLOGICAL LEVELS VELOCITIES

VELOCITY SURVEY

KIRKLAND

DKB	DOP	AVST	IV	AV
	0.0	0.0	12815.3	
1285.0	1270.0	99.1	17045.5	12815.3
1510.0	1495.0	112.3	18352.1	13312.6
2000.0	1985.0	139.0	20576.1	14280.6
2500.0	2485.0	163.3	18823.5	15217.4
2980.0	2965.0	188.8	18666.7	15704.4
3652.0	3637.0	224.8	18913.0	16175.8
4000.0	3985.0	243.2	18631.2	16385.7
4493.0	4475.0	269.5	19101.1	16604.8
5000.0	4985.0	296.2	19034.0	16829.8
5500.0	5485.0	322.4	18726.6	17013.0
6000.0	5985.0	349.1	19271.7	17144.1
6459.5	6474.5	374.5	19000.0	17288.4
6515.0	6503.0	376.0		17295.2

APPENDIX 3 cont'd

September 13, 1990

Mr. Robert Gentry
c/o Earth Science Associates
6321 Cate Road
Powell, Tennessee 37849

P/N 795

Dear Bob,

Enclosed is a copy of the completion report on the Phillips State A-1 well of which we have spoken. I am also sending a copy of an article on the well which may be of interest to you and is fairly obscure outside Arizona.

I have looked at some of cuttings and the ones I picked out are rather fine, about the size of fine sand. But I could see mica with the naked eye. The completion report lists three cores. We have cuttings from the upper two intervals, but I did not see any chips. We do have chunks from the lowest core. The rocks appear to be a hornblende or two-mica granite gneiss and a more or less homogeneous finely crystalline "greenstone" or some such metamorphic mess.

I believe you could pick a gram or so of the mica from two or three of the ten-foot samples. Since the sample is so mixed in the annulus on the way uphole, no sample is perfectly representative of the interval marked on the envelope. Anyway we don't have any indication of the time it took the sample to reach the surface, so the depth is only approximate.

I am also sending along a copy of our policy for use of samples. You could probably get the best results by coming out here to use them, and we would rather not ship samples. We can ship them if necessary, at your expense.

The Phillips 1-A Kirkland State in Sec 32, T13N-R6W drilled in granite or granite gneiss from under the grass roots (if any) to TD at 6500 feet.

Just write us a letter indicating what you would like to do and accepting our policy on sample use and we will try to help you out.

Very truly yours,

Daniel J. Brennan

RECEIVED
JUL 27 1983
O & G CONS. COMM.

PHILLIPS PETROLEUM COMPANY
DENVER, COLORADO 80237
8055 EAST TUFTS AVENUE PARKWAY

DATA TRANSMITTAL

DATE: 25 July 1983

TO: OIL AND GAS CONSERVATION COMMISSION
1645 W. Jefferson, Suite 420
Phoenix, Arizona 85007
Attn: A. K. Doss

RE: WELL NAME Phillips - Kirkland State A #1
Sec. 32-14N 6W
Yavapai County, Arizona

ENCLOSED PLEASE FIND THE FOLLOWING:

1. ____ copies of Approved Well Permit
2. ____ copies of Core Analysis/Description
3. ____ copies of Drilling History
4. ____ copies of DST Charts/Reports
5. ____ copies of Fluid (gas, water, oil) Analysis
6. ____ copies of Geological Prognosis and Drilling Program
7. ____ copies of Geological Report
8. ____ copies of Survey Plat
9. ____ copies of Well Completion Report
10. ____ copies of Well Permit Application
11. ____ copies of Field Prints of Logs
12. 2 copies of Final Prints of Logs Mudlog 50' - 6500' T.D.
    2 copies of Velocity Survey w/ Calculation of Synthetic Seismogram
    ____ copies of
    ____ copies of
    ____ copies of

RECEIVED BY: [signature] DATE: 7-27-83

PLEASE ACKNOWLEDGE RECEIPT BY SIGNING AND RETURNING THE ENCLOSED COPY TO THE ABOVE ADDRESS. THANK YOU.

Pat Bertuzzi
Pat Bertuzzi - Development - 7th Floor

RECEIVED
JUL 7 1983
O & G CONS. COMM.

PHILLIPS PETROLEUM COMPANY
DENVER, COLORADO 80237
8055 EAST TUFTS AVENUE PARKWAY

DATA TRANSMITTAL

TO: OIL AND GAS CONSERVATION COMMISSION
1645 W. Jefferson, Suite 420
Phoenix, Arizona 85007

DATE: 5 July 1983

Attn: Mr. A. K. Doss

RE: WELL NAME Phillips Petroleum - Kirkland State A#1
Sec 32 - 14N 6W
Yavapai County, Arizona

ENCLOSED PLEASE FIND THE FOLLOWING:

1. ____ copies of Approved Well Permit
2. ____ copies of Core Analysis/Description
3. ____ copies of Drilling History
4. ____ copies of DST Charts/Reports
5. ____ copies of Fluid (gas, water, oil) Analysis
6. ____ copies of Geological Prognosis and Drilling Program
7. ____ copies of Geological Report
8. ____ copies of Survey Plat
9. ____ copies of Well Completion Report
10. ____ copies of Well Permit Application
11. 2ea copies of Field Prints of Logs Borehole Sonic Runs #1 + #2 July 13, 1982 + Sept. 6.
12. 2ea copies of ~~Final~~ Field Prints of Logs Dual Induction Runs #1 + #2 " "
    2ea copies of Field prints - Continuous Dipmeter Run #2 9-7-82
    2ea copies of Final prints - Directional log Run #1 9-7-82
    ____ copies of ____
    ____ copies of ____

RECEIVED BY: ____ DATE: ____

PLEASE ACKNOWLEDGE RECEIPT BY SIGNING AND RETURNING THE ENCLOSED COPY TO THE ABOVE ADDRESS. THANK YOU.

Pat Bertuzzi
Pat Bertuzzi - Development - 7th Floor

PHILLIPS PETROLEUM COMPANY
DENVER, COLORADO 80237
8055 EAST TUFTS AVENUE PARKWAY

DATA TRANSMITTAL

TO: OIL AND GAS CONSERVATION COMMISSION
1645 W. Jefferson, Suite 420
Phoenix, Arizona 85007

DATE: 30 June 1983

Attn: Mr. A. K. Doss

RE: WELL NAME Phillips - Kirkland State A#1
Sec 32-14N 6W
Yavapai County, Arizona

ENCLOSED PLEASE FIND THE FOLLOWING:

1. _____ copies of Approved Well Permit
2. _____ copies of Core Analysis/Description
3. _____ copies of Drilling History
4. _____ copies of DST Charts/Reports
5. _____ copies of Fluid (gas, water, oil) Analysis
6. _____ copies of Geological Prognosis and Drilling Program
7. _____ copies of Geological Report
8. _____ copies of Survey Plat
9. _____ copies of Well Completion Report
10. _____ copies of Well Permit Application
11. 2ea copies of Field Prints of Logs Comp. Neutron + Temperature, Run #2 9-6-82
12. 2 copies of Final Prints of Logs Continuous Dipmeter Run #1 9-7-82

_____ copies of _____
_____ copies of _____
_____ copies of _____
_____ copies of _____

RECEIVED BY: _____ DATE: _____

PLEASE ACKNOWLEDGE RECEIPT BY SIGNING AND RETURNING THE ENCLOSED COPY TO THE ABOVE ADDRESS. THANK YOU.

Pat Bertuzzi
Pat Bertuzzi - Development - 7th Floor

RECEIVED
OCT 6 1982
O & G CONS. COMM.

PHILLIPS PETROLEUM COMPANY
DENVER, COLORADO 80237
8055 EAST TUFTS AVENUE PARKWAY

September 28, 1982

A.K. Doss
Arizona Oil and Gas
Conservation Commission
1645 West Jefferson
Suite 4200
Phoenix, Arizona 85007

Dear Mr. Doss:

With this letter we are sending core chips taken at one foot intervals from cores cut on our current drilling program since our last shipment on July 28. The samples included in this shipment are:

S/N 1839

KIRKLAND STATE A-1
SE SE 32-14N-6W, Yavapai County
Core 2: 5,187'-5,191'
Core 3: 6,500'-6,501'

The shipment will be the last from our stratigraphic well program. We have no rigs operating in Arizona at this time and no commitments have been made for future drilling. Any questions regarding these samples should be directed to me at (303) 850-3233.

Sincerely,

Jamie Robinson

cc: C.W. Betton
(r) file

JR/bm

795

PHILLIPS PETROLEUM COMPANY
DENVER, COLORADO 80237
8055 EAST TUFTS AVENUE PARKWAY

July 28, 1982

A.K. Doss
Arizona Oil and Gas
Conservation Commission
1645 West Jefferson, Suite 4200
Phoenix, Arizona 85007

Dear Mr. Doss:

With this letter we are sending core chips taken at one foot intervals from cores cut on our current drilling program since our last shipment on June 10. The samples included in this shipment are:

S/N 1833
P/N 793

Douglas State A-1
NW NW 14-23S-29E, Cochise County
Core 3 - 7027'-7054'

7027-7046
7048-7054

S/N 1840
P/N 796

Mountain View State A-1
SW NE 10-17S-15E, Pima County
Core 1 - 8325'-8352'

8325-27
8329-32

S/N 1839
P/N 795

Kirkland State A-1
SE SE 32-14N-6W, Yavapai County
Core 1 - 1118'-1127'

Any questions regarding these samples or the drilling project should be directed to me at (303) 779-8989, extension 475. Please note our new mailing address.

Sincerely,

Jamie Robinson
Geologist

cc: C.W. Betton
(r) file

JR/bm

February 2, 1982

Mr. D. J. Fisher
Phillips Petroleum Co.
P.O. Box 2920
Casper, Wyoming 82602

Dear Mr. Fisher:

Enclosed are approved application for permit to drill, permit to drill, and receipt for the following six strat wells:

Permit No.	
793	Douglas Al State
794	Huachaca Al State
795	Kirkland Al State
796	Mtn View Al State
797	Redondo Al State
798	Safford Al State

As requested, this Commission has approved a one-year extension of the drilling permits issued February 1, 1982, on the above wells.

If we can be of further service, please advise.

Sincerely,

A. K. Doss
Executive Director

/os
Enc.

RECEIVED
1982
O & G CONS. COMM.

PHILLIPS PETROLEUM COMPANY
P. O. Box 2920
Casper, WY 82602-2920

January 27, 1982

Mr. A. K. Doss
Oil & Gas Conservation Commission
State of Arizona
1645 West Jefferson
Suite 420
Phoenix, AZ 85007

Re: Applications For Permit
To Drill Various Counties,
Arizona.

Dear Sir:

Enclosed are APD's to drill the following six "strat" wells:

Douglas State "A" No. 1
Huachaca State "A" No. 1
795 Kirkland State "A" No. 1
Mtn. View State "A" No. 1
Redondo State "A" No. 1
Safford State "A" No. 1

As approved by you in a telephone conversation with Frank Lyte, of this office, on January 25th, the certified plats are being prepared by the surveyor and will be mailed to you as soon as received in this office. As previously done by the A.O. & G.C., granting a one year extension to these six permits is respectfully requested.

Your continued cooperation in expediting approvals by your office and other Arizona State agencies will be appreciated.

Very truly yours,

PHILLIPS PETROLEUM COMPANY

D. J. Fisher
Area Manager

FGL/jj

Enclosure