DUVAL CORPORATION #13-A STATE NO PERMIT
NE NW Sec 34-T18N-R26E APACHE COUNTY 1-55

1-55

County Apache

Area Holbrook Basin

Lease No. State

Well Name Duval Corporation #13-A State

Location NE NW Sec 34 Twp 18N Range 26E Footage 770' FNL - 2256' FWL

Elev 5915' Gr _____ KB Spud Date 1-9-64 ~~Completed~~ Abandon 3-23-64 Total Depth 1548'

Contractor

Drilled by Rotary
Cable Tool

Casing Size	Depth	Cement
4-1/2"	1350'	

Production Horizon

Initial Production

REMARKS This hole drilled as a potash test.

See file for Core Lithology. (Footage 1356 - 1547.7')

Elec Logs Radioactivity Log;

Applic. to Plug ___ Plugging Record x Completion Report x

Sample Log
Sample Descript.
Sample Set P-1328
Core Analysis
DSTs

Water well accepted by

Bond Co. & No. None

Bond Am't $ _____ Cancelled _____ Date Organization Report None

Filing Receipt None Dated _____ Well Book x Plat Book x

API No. 02-001-05056 Loc. Plat ___ Dedication None (Strat)

Permit Number None Date Issued _____

1-55

WELL COMPLETION OR RECOMPLETION REPORT AND WELL LOG

DESIGNATE TYPE OF COMPLETION:

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

DESCRIPTION OF WELL AND LEASE

Operator: DUVAL CORPORATION	Address: 4715 E. FT. LOWELL RD. TUCSON, ARIZ.
Lease Name:	Well Number: 13-A — Field & Reservoir:

Location: 4510' NORTH & 3024' WEST of S.E. COR. SEC. 34 — Sec.—TWP-Range or Block & Survey: T18N, R26E

County	Permit number	Date Issued	Previous permit number	Date Issued
APACHE				

Date spudded	Date total depth reached	Date completed, ready to produce	Elevation (DF, RKB, RT or Gr.) feet	Elevation of casing hd. flange feet
1-9-64	3-23-64	3/23/64		

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.
1548			

Producing interval (s) for this completion	Rotary tools used (interval)	Cable tools used (interval)

Was this well directionally drilled?	Was directional survey made?	Was copy of directional survey filed?	Date filed

Type of electrical or other logs run (check logs filed with the commission)	Date filed
RADIOACTIVITY LOG	

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

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

PERFORATION RECORD			ACID, SHOT, FRACTURE, CEMENT SQUEEZE RECORD	
Number per ft.	Size & type	Depth Interval	Am't. & kind of material used	Depth Interval

INITIAL PRODUCTION

Date of first production	Producing method (indicate if flowing, gas lift or pumping—if pumping, show size & type of pump:)

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

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

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.....of the .....(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 ..... Signature .....

STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION

Well Completion or Recompletion Report and Well Log

Form No. P-7 File two copies

PLUGGING RECORD

Operator: DUVAL CORPORATION	Address: 4715 E. FT LOWELL RD. TUCSON, ARIZONA
Name of Lease	Well No.: 13A — Field & Reservoir
Location of Well: 4510' NORTH & 3024' WEST OF S.E. COR. SEC. 34	Sec-Twp-Rge or Block & Survey: T18N, R26E — County: APACHE
Application to drill this well was filed in name of	Has this well ever produced oil or gas — Character of well at completion (initial production): Oil (bbls/day) — Gas (MCF/day) — Dry?
Date plugged: 3-23-64	Total depth: 1548 — Amount well producing when plugged: Oil (bbls/day) — Gas (MCF/day) — Water (bbls./day)

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.

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

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

Indicate deepest formation containing fresh water.

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

Name	Address	Direction from this well:

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.

Use reverse side for additional detail

File this form in duplicate with the State of Arizona Oil & Gas Conservation Commission

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the.....of the .....(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 ..... Signature .....

STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION

Plugging Record — File two copies

Form No. P-15

Hole No.	Interval (feet)	Formation or Member
13A	Ground elevation 5915'	
	0-100	(No samples)
	-155	Sonsela
	155-	Lower Petrified Forest
	564	Top of greenish-grey unit
	840-977	Lower Hupatki
	977-1295	Coconio
	1295-	Supai
	1390	Top of 1st marker Anhydrite
14	Ground elevation 6390'	
	0-100	(No samples)
	-315	Bidahochi
	315-	Upper Petrified Forest
	1090-	Lower Petrified Forest
	1312	Top greenish-grey unit
	1588-1740	Lower Hupatki
	1740-~~2000~~ 2080	Coconino
	2080 ~~2080~~	Supai
	2203	Top of 1st marker Anhydrite
15	Ground elevation 6140'	
	0-85	Dune Sand
	85-170	Bidahochi
	170-	Upper Petrified Forest
	640-	Lower Petrified Forest
	1035	Top of greenish-grey unit
	1265-	Shinarump
	1303-1453	Lower Hupatki
	1453-1760	Coconino
	1760-	Supai
	1830	Top of 1st marker Anhydrite
16	Ground elevation 5705'	
	30-	Lower Petrified Forest
	333	Top of greenish-grey unit
	550-	Shinarump
	652-838	Lower Hupatki
	838-1145	Coconino
	1145-	Supai
	1249	Top of 1st marker Anhydrite

RECEIVED
JUL 20 1965
STATE O & G
CONS. COMM.

1-55

Form 3
2M Sheets 5-54

DUVAL SULPHUR & POTASH COMPANY
POTASH DIVISION
CARLSBAD, NEW MEXICO

WHILE WE BELIEVE THIS INFORMATION TO BE CORRECT. WE MAKE NO REPRESENTATION WITH RESPECT TO, NOR DO WE ASSUME ANY RESPONSIBILITY FOR, THE CORRECTNESS THEREOF.
DUVAL CORPORATION

CORE LITHOLOGY

WELL NO. 13-A

DEPTH (Feet) From		DEPTH (Feet) To		INTERVAL Feet		ESTIM. % Shale	ESTIM. % PA	DESCRIPTION
								Abbreviations: H - Halite; Gyp - Gypsum; A - Anhydrite; C-S - Clay-Silt; P - Polyhalite; med.g. - Medium grained; S - Sylvite; clr - clear; C - Carnallite; occ - occasional; f.g. - fine grained; V - Very; c.g. - coarse grained; incr - increasing; incl - inclusions; decr - decreasing; irreg - irregular; brn - brown
1356	0							STARTED CORING
1356	0	1365	3	9	3	-	100	A, gray, mottled, little brn (lost 5 ft. core).
1365	3	1372	9	7	6	99	1	C-S, brn, little gray, hard; occ thin irreg Gyp stringer.
1372	9	1373	0	0	1	-	100	Gyp, white.
1373	0	1376	8	3	8	98	2	C-S, brn, med. hard; few irreg Gyp stringers.
1376	8	1377	0	0	2	-	100	Gyp, white.
1377	0	1379	5	2	5	96	4	C-S, brn, med. hard; few irreg white Gyp stringers.
1379	5	1380	7	1	2	3	97	Gyp, white, in upper 0.7' & lower 0.1', & A, lt. gray between; few small brn C-S stringers in middle 0.2'.
1380	7	1383	2	2	5	95	5	C-S, dk. brn, occ gray spot, med. soft; few V irreg white Gyp bands & stringers.
1383	2	1384	3	1	1	4	96	A, gray, little white Gyp at top & base; some soft brn C-S incls, grading out down from 30% in top 0.4'.
1384	3	1385	8	1	5	99	1	C-S, dk. brn; V few small white A blebs & stringers.
1385	8	1388	0	2	2	2	98	A, gray, V little white Gyp at base; ½" brn C-S parting 0.2' above base.
1388	0	1393	2	5	2	95	5	C-S, dk. brn, occ gray clay; some irreg med. white Gyp stringers & blebs.
1393	2	1405	4	12	2	-	100	A, gray, banded.
1405	4	1412	0	6	6	98	2	C-S, brn, top 0.3' gray; V few white Gyp blebs.

Form 3-A
3M Sheets 5-54

DUVAL SULPHUR & POTASH COMPANY

WELL NO. 13-A

CORE LITHOLOGY

PAGE NO. 2

DEPTH (Feet) From		DEPTH (Feet) To		INTERVAL Feet		ESTIM. % Shale	ESTIM. % A	DESCRIPTION
1412	0	1414	2	2	2	1	99	A, gray, V minor pink bands; 10% C-S in top 0.1'.
1414	2							TOP OF SALT
1414	2	1416	3	2	1	5	-	H, med.; some small soft brn C-S incls, grading
								out down, ½" brn C-S band at top.
1416	3	1418	4	2	1	-	3	H, clr, med.-c.g.; few V irreg tan A blebs & stringers
1418	4	1419	7	1	3	-	1	H, V clr, V c.g.; V few med. pink-gray A blebs.
1419	7	1420	6	0	9	-	7	H, V clr, med.; some small tan A blebs & stringers
								in lower half & top ½".
1420	6	1421	7	1	1	35	-	H, f.g.-c.g., & C-S, brn, small-lg. incls & V
								irreg stringers.
1421	7	1425	9	4	2	55	-	C-S, dk. brn, soft, many small-lg. incls, 0.1' band
								at top, 0.2' bands at 1422.2' & 1423.7', 0.3' band
								at 1424.3', & H, f.g.-c.g., V irreg, occ pink
								schistose incl.
1425	9	1426	4	0	5	8	2	H, med.; some brn C-S incls; few small gray A blebs.
1426	4	1427	8	1	4	60	-	C-S, brn, & H, med., V irreg.
1427	8	1430	4	2	6	10	-	H, med.-c.g.; some med. brn C-S incls.
1430	4	1436	4	6	0	10	-	H, med.-c.g.; some small-med. brn C-S incls, grading
								out down from 20% at top, 0.1' brn C-S band at top;
								occ pink A bleb in lower ½ ft.
1436	4	1444	5	8	1	-	80	A, gray, some med. H intergrowths in lower 3/4
								interval, V small red C-S stringers near base.
1444	5	1446	7	2	2	-	8	H, clr, med.-V c.g.; some lg. irreg gray-tan A
								stringers in upper ft. as a 20% zone; occ small
								brn C-S incl near top.
1446	7	1447	8	1	1	10	-	H, f.g.; some small brn C-S incls & half inch
								band at top.
1447	8	1450	2	2	4	30	-	H, med; many small to lg. brn C-S incls. incr down
								from 20% at top to 40% at bottom.
1450	2	1451	3	1	1	12	-	H, med; some small to med brn C-S incls incr down
								from 5% to 20%.
1451	3	1451	9	0	6	70	-	C-S, brn, soft; some irreg H, c.g.

Form 3-A
3M Sheets 5-54

DUVAL SULPHUR & POTASH COMPANY

WELL NO. 13 - A

CORE LITHOLOGY

PAGE NO. 3

DEPTH (Feet) From		To		INTERVAL Feet		ESTIM. % Shale	PCA	DESCRIPTION
1451	9	1457	5	5	6	5	1	H, med. to c.g.; few irreg small-lg. brn C-S incls; occ med. gray A bleb.
1457	5	1462	0	4	5	3	-	H, clr, med.-c.g.; few small to med. brn C-S incls.
1462	0	1464	5	2	5	-	-	H, V clr, med. to c.g.; occ small brn C-S incl & tan A stringer.
1464	5	1466	3	1	8	80	-	C-S, brn, soft; 50% H zone in top half ft., 40% H in lower 0.3'.
1466	3	1471	9	5	6	15	-	H, med.-c.g.; some irreg small-lg. brn C-S incls.
1471	9	1474	0	2	1	6	-	H, med; few small-lg. brn C-S incls & stringers.
1474	0	1476	3	2	3	45	-	H, med, & med-V lg. brn C-S incls, incr down from 30% at top to 60% at base; few irreg med. red S blebs. Est. K_2O/S = 1%
1476	3	1478	5	2	2	8	1	H, med; some irreg med.-lg. brn C-S incls, ½" irreg band at base; V few small gray A blebs.
1478	5	1481	10	2	60	-	-	H, V clr, c.g.; V few small red S blebs; occ small C-S incl in upper half & tan A stringers. Est. K_2O/S = 1%
1481	10	1482	20	1	10	2	1	H, clr, med to c.g.; few small red & red-rimmed milky S blebs; few small brn C-S incls; occ V small gray A stringer, ¼" band at base. Est. K_2O/S = 2%
1482	20	1483	40	1	20	-	8	H, clr, med to c.g.; numerous small to med gray A stringers, partings at 1482.95' & 1483.05'; some small to lg. red & red-rimmed milky S blebs, 0.2' zone 50% S at 1482.50'. Est. K_2O/S = 12%
1483	40	1483	60	0	20	-	6	H, clr med-c.g.; few clr-pink med S blebs; few lg. gray A blebs. Est. K_2O/S = 8%
1483	60	1484	45	0	85	-	12	H, clr, f.g. & A, gray, thin bands & blebs; few irreg med red S blebs. Est. K_2O/S = 5%
1484	45	1485	70	1	25	-	2	H clr c.g. & S, clr-milky to tan; V few med white A blebs. Est. K_2O/S = 20%
1485	70	1485	85	0	15	-	-	H, clr; some S(?) (Core broken up). Est. K_2O/S = 10%

Form 3-A
3M Sheets 5-54

DUVAL SULPHUR & POTASH COMPANY

WELL NO. 13-A

CORE LITHOLOGY

PAGE NO. 4

DEPTH (Feet) From		DEPTH (Feet) To		INTERVAL Feet		ESTIM. % Shale	ESTIM. % RA	DESCRIPTION
1435	85	1436	50	0	65	-	2	H, clr med & S, clr-milky-pink, med to c.g.; few A/P pink blebs in lower 0.1 ft. Ests K_2O/S = 25%
1436	50	1438	50	2	00	5	1	H, clr, med-c.g.; few med brn C-S stringers & red S blebs; occ small gray A bleb. Est. K_2O/S 3%
1438	50	1439	25	0	75	2	1	H, clr med & S, red-rimmed milky, med; V few small gray clay incls; occ gray A bleb. Est. K_2O/S 24%
1439	25	1439	65	0	40	10	1	H, clr, med; 0.05' brn clay band at top, few incls below; V few small red S blebs; occ small gray A bleb. Est. K_2O/S = 2%
1439	65	1440	75	1	10	-	2	H, clr, med; few irreg med gray A blebs; V few small red S blebs; occ small gray clay incl. Est. K_2O/S 1%
1440	75	1442	9	2	15	-	2	H, clr med; few med irreg gray A blebs, ½" white A band at base.
1442	9	1443	7	0	8	15	-	H, med; some irreg brn C-S bands & stringers.
1443	7	1446	5	2	8	75	-	C-S, brn soft, decr down from 90% at top to 60% at base; some H med.
1446	5	1501	8	5	3	40	-	H, c.g.; some V lg. brn C-S incls & bands.
1501	8	1505	3	3	5	5	-	H, clr, c.g.; some med brn C-S incls grading out down from 10% at top.
1505	3	1508	2	2	9	-	-	H, V clr, med-c.g.
1508	2	1513	0	4	8	-	2	H, clr, med; few irreg med gray A stringers & bleb; occ small brn C-S incl.
1513	0	1514	8	1	8	25	-	H, f.g. to med; some small to lg. brn C-S incls decr down from 30% at top to 10% at base & 0.1' band at top.
1514	8	1516	2	1	4	70	-	C-S, brn, hard; some irreg med H blebs.
1516	2	1519	2	3	0	6	1	H, clr med to c.g.; few small to med brn C-S incls decr down from 10% at top to 2% at base; V few small white A blebs in upper half.
1519	2	1529	0	9	8	1	1	H, clr, med to c.g.; V few small brn C-S stringers grading out down from 2% at top; occ small gray A bleb.

Form 3-A
3M Sheets 5-54

DUVAL SULPHUR & POTASH COMPANY

WELL NO. 13-A — CORE LITHOLOGY — PAGE NO. 5

DEPTH (Feet) From		To		INTERVAL Feet		ESTIM. % Shale	RA	DESCRIPTION
1529	0	1530	4	1	4	80	-	C-S, brn, med hard; few irreg med H incls & 0.1'
								band 1529.5'.
1530	4	1534	0	3	6	2	-	H, clr, f. to c.g.; few small brn C-S incl grading
								out down from 4% at top.
1534	0	1534	2	0	2	100	-	C-S brn (broken).
1534	2	1539	0	4	8	-	1	H, V clr, c.g. V few small white A stringers.
1539	0	1540	7	1	7	-	80	A, white-gray; some med H intergrowths.
1540	7	1541	9	1	2	100	-	C-S, brn, soft.
1541	9	1547	7	5	8	2	3	H, clr, f. to med.g.; few med white A stringers in
								lower half, 1" band at 1546.3'; few V small brn
								C-S incls.
1547	7							TOTAL DEPTH

LOGGED BY B. F. McGuire

B. F. McGuire

1-55

FORM 159

DUVAL CORPORATION

INTER-OFFICE MEMORANDUM

FROM Navajo, Arizona

DATE March 30, 1964

TO Esperanza

ATTENTION E.G. Messer

SUBJECT: Duval # 13A State

Location: 0960 FNL, 2640 FEL, S.~~10~~ 34, T.18N., R.26E.
Date Started: January 9, 1964
Date Completed: March 23, 1964
Elevation, G.L.: 5915
T.D.: 1548
Casing: 1350
Elevation Top Coconino: 4938
Elevation Top Halite: 4502
Elevation Top Sylvite: 4436 (4444?)

5915
4502
1413

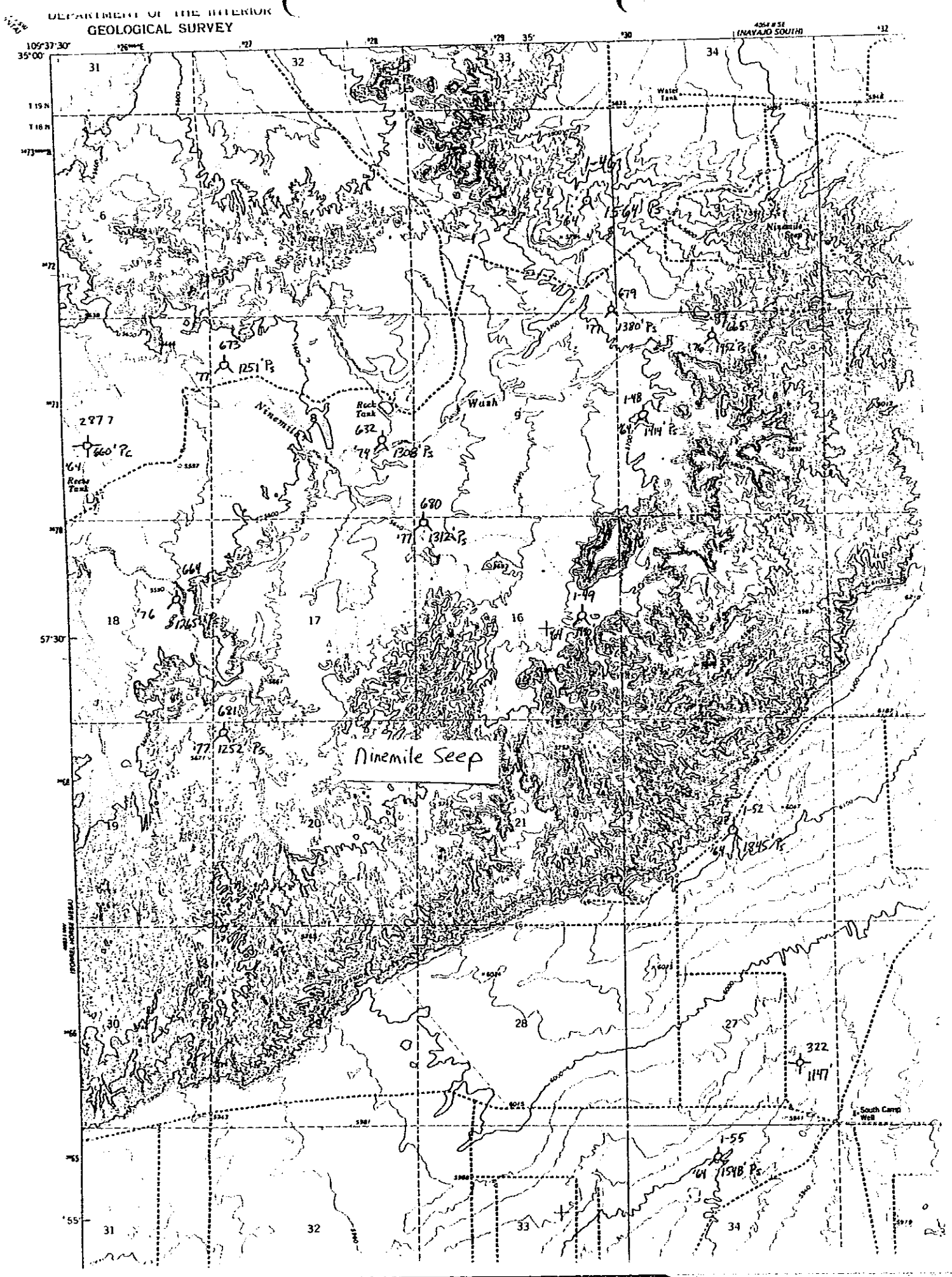
1479

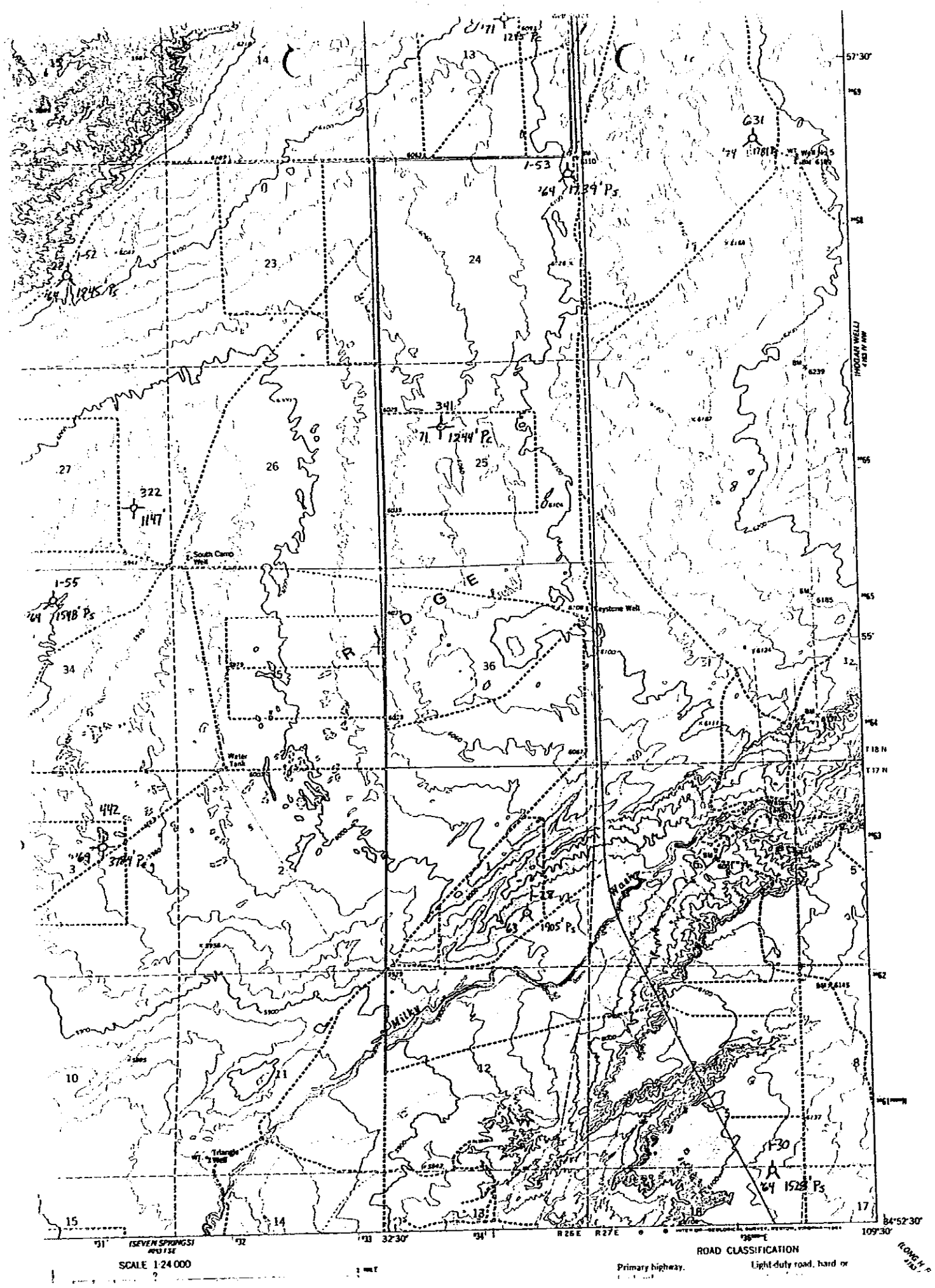
5915
4502
1413

5915
4436
1479

5915
972
4938

5280
960
4320


DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
(NAVAJO SOUTH)
Water Tank
Ninemile Seep
Rock Tank
Wash
Ninemile Wash
Rock Tank
Ninemile Seep
South Camp Well
1-46
1564' Ps
1380' Ps
1952' Ps
1251' Ps
1-48
1414' Ps
2877
660' Pc
1308' Ps
1312' Ps
1-49
1252' Ps
1-52
1845' Ps
322
1147'
1-55
1548' Ps


South Cerro Well
Keystone Well
Water Tank
Triangle Well
Wash
Wash
(SEVEN SPRINGS) 4WD USE
(LONG H P 4WD)
SCALE 1:24 000
ROAD CLASSIFICATION
Primary highway.
Light-duty road, hard or
R 26 E
R 27 E
T 18 N
T 17 N
32'30"
109°30'
34°52'30"
57'30"
55'