

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK  
 DRILL       DEEPEN       PLUG BACK

b. TYPE OF WELL  
 OIL WELL       GAS WELL       OTHER   
 SINGLE ZONE       MULTIPLE ZONE

2. NAME OF OPERATOR  
Phillips Petroleum Company

3. ADDRESS OF OPERATOR  
4001 Penbrook St., Odessa, Texas 79762

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)  
 At surface: Unit F, 1980' FWL & 1980' FNL  
 At proposed prod. zone: Unit F, 1980' FWL & 1980' FNL

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*  
22mi. East of Carlsband, NM

15. DISTANCE FROM PROPOSED\* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drig. unit line, if any) 1980'

16. NO. OF ACRES IN LEASE 320.48

17. NO. OF ACRES ASSIGNED TO THIS WELL 40

18. DISTANCE FROM PROPOSED LOCATION\* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT. 3120'

19. PROPOSED DEPTH 7700'

20. ROTARY OR CABLE TOOLS  
Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.)  
3316' (Unprepared)

22. APPROX. DATE WORK WILL START\*  
Upon approval

5. LEASE DESIGNATION AND SERIAL NO.  
NW 70335

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME  
Livingston Ridge

9. WELL NO.  
7

10. FIELD AND POOL, OR WILDCAT  
Cabin Lake (Delaware)

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA  
Sec. 1, T-22-S, R-30-E

12. COUNTY OR PARISH  
Eddy

13. STATE  
NM

PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
17-1/2"	13-3/8"	48#	475'	650 sk C-Circ. to surface
12-1/4"	8-5/8"	24#	3700'	1200 sk C-Circ. to surface
7-7/8"	5-1/2"	15.5# & 14#	7700'	900 sk C-TOC 3500'

USE MUD ADDITIVES AS NEEDED FOR CONTROL

BOP EQUIPMENT FIGURE 7-9 or 7-10 (See attached schematic)

DRILLING PERMIT ISSUED 6-19-90 EXPIRED. THIS APPLICATION TO REINSTATE PERMIT TO DRILL.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24. SIGNED [Signature] TITLE Assistant, Regulation and Proration DATE 9-6-91

(This space for Federal or State office use)

PERMIT NO. \_\_\_\_\_ APPROVAL DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

CONDITIONS OF APPROVAL, IF ANY:

\*See Instructions On Reverse Side

## INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated, on all types of lands and leases for appropriate action by either a Federal or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office.

ITEM 1: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable State or Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on this reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal or State agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective production zone.

ITEM 22: Consult applicable Federal or State regulations, or appropriate officials, concerning approval of the proposal before operations are started.

## NOTICE

The Privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR Part 3160.

PRINCIPAL PURPOSE: The information is to be used to process and evaluate your application for permit to drill, deepen, or plug back an oil or gas well.

ROUTINE USES: (1) The analysis of the applicant's proposal to discover and extract the Federal or Indian resources encountered. (2) The review of procedures and equipment and the projected impact on the land involved. (3) The evaluation of the effects of proposed operation on surface and subsurface water and other environmental impacts. (4)(5) Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions, as well as routine regulatory responsibility.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if the lessee elects to initiate drilling operations on an oil and gas lease.

The Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq) requires us to inform you that:

This information is being collected to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases.

This information will be used to analyze and approve applications.

Response to this request is mandatory only if the lessee elects to initiate drilling operations on an oil and gas lease.

NEW MEXICO OIL CONSERVATION COMMISSION  
WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102  
Supersedes C-128  
Effective 1-1-65

All distances must be from the outer boundaries of the Section.

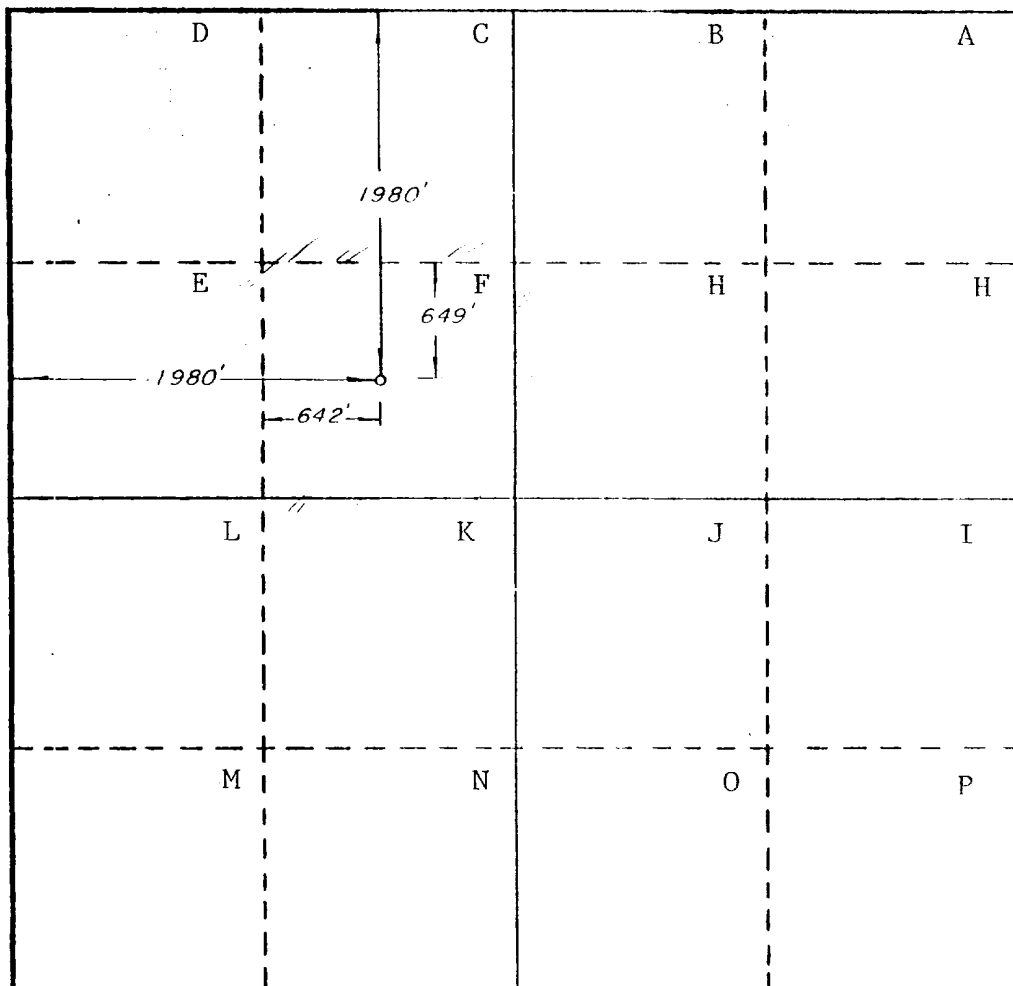
Operator PHILLIPS PETROLEUM COMPANY			Lease Livingston Ridge		Well No. 7
Unit Letter F	Section 1	Township 22-S	Range 30-E	County Eddy	
Actual Footage Location of Well:					
1980 feet from the North		line and	1980 feet from the West		line
Ground Level Elev. 3314'	Producing Formation Delaware	Pool Cabin Lake (Delaware)		Dedicated Acreage: 40 Acres	

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).
3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling, etc?

Yes  No If answer is "yes," type of consolidation \_\_\_\_\_

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) \_\_\_\_\_

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

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

*J. L. Maples*

Name  
J. L. Maples

Position  
Asst., Regulation & Proration

Company  
PHILLIPS PETROLEUM COMPANY

Date  
5/21/90

I hereby certify that the well location shown on this 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.

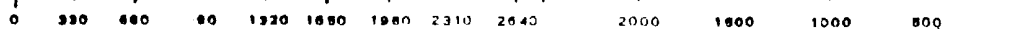
April 2, 1990

Date Surveyed  
Richard B. Duniven

Registered Professional Engineer  
and/or Land Surveyor

*Richard B. Duniven*

Certificate No.  
4882



SURFACE USE PLAN

Phillips Petroleum Company, Livingston Ridge Lease, Well No. 7, 1980' FNL & 1980' FWL, Section 1, T-22-S, R-30-E, Eddy County, New Mexico. (Fed Lease No. 70335.)

This plan is to accompany "Application for Permit to Drill" the subject well which is located approximately 22 miles east of Carlsbad, New Mexico. The following is a discussion of pertinent information concerning the possible effect which the proposed drilling well may have on the environment of the well and road sites and surrounding acreage. A copy will be posted on the derrick floor so that all contractors and sub-contractors will be aware of all items of this plan.

1. Existing Roads

- A. None  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Planned Access Roads

- A. To run west to east to planned drillsite.  
\_\_\_\_\_
- B. Turnouts: None
- C. Drainage Design: New road will have center line to side line slope  
\_\_\_\_\_
- D. Culverts, Cuts and Fills: None
- E. Surfacing Material: Caliche well pad and roads.
- F. Gates, Cattleguards, Fences: None
- G. Proposed Road: The proposed road is centerline staked.

3. Locations of Existing wells: None  
\_\_\_\_\_

4. Locations of Tank Batteries, Production Facilities, Production Gathering, and Service Lines: The present tank battery is located - Section 1, T-22-S, R-30-E  
Flow line from Well No. 7 to run alongside proposed access roadway.

5. Water Supply Source: Hauled

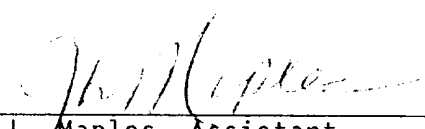
6. Source of Construction Materials

- A. Caliche for surfacing the new road and well pads will be obtained from Federal pit from Section 11
- B. Caliche pit is located on Federal pit from Section 11

7. Methods for Handling Waste Disposal

Will be put in separate waste pits and covered with minimum of 2' backfill. (See sketch.) If well is productive, maintenance waste will be placed in special trash cans and hauled away periodically. All produced water will be collected in tanks until hauled to an approved disposal system, or separate disposal applications will be submitted for appropriate approval.

8. Ancillary Facilities: None
9. Well Site Layout: Attached sketch shows the relative location and dimensions of the well pad, mud pit, reserve pit, and trash pit. Location will be 250 X 250.
10. Plans for Restoration of Surface:  
Pit will be backfilled and levelled as soon as practical to original condition. If well is productive, caliche pad will remain as well service pad. If dry hole, pads and access roads will be ripped per regulations. Commencement of rehabilitation operations will immediately follow removal of drilling and completion equipment from location and rehabilitation of the surface is planned to be completed within 60 days from commencement.
11. Other Information:
- A. Terrain: See Archaeological Survey
- B. Soil: See Archaeological Survey
- C. Vegetation: See Archaeological Survey
- D. Surface Use: Possible grazing
- E. Ponds and Streams: None
- F. Water Wells: None
- G. Residences and Buildings: 2 miles west of drill site
- H. Arroyos, Canyons, etc.: None
- I. Well Sign: Sign identifying and locating the well will be maintained at drill site with the spudding of the well.
- J. Archaeological Resources: See Archaeological Survey
12. Operator's Representative: Field personnel who can be contacted concerning compliance of the "Surface Use Plan" is as follows:
- |                         |    |                         |
|-------------------------|----|-------------------------|
| Production and Drilling | or | D. J. Fisher            |
| P. D. Appel             |    | 1625 West Marland       |
| 4001 Penbrook Street    |    | Hobbs, New Mexico 88240 |
| Odessa, Texas 79762     |    | Phone: 505-393-5121     |
| Phone: 915-367-1411     |    |                         |
13. Certification:  
I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Phillips Petroleum Company and its contractors and sub-contractors in conformity with this plan and the terms and conditions under which it is approved.

  
\_\_\_\_\_  
J. L. Maples, Assistant  
Regulation and Proration  
(915) 367-1411

May 14, 1990  
Date

PHILLIPS PETROLEUM COMPANY  
Livington Ridge Well No. 7  
Eddy County, New Mexico

DRILLING PROGNOSIS

1. Location of Proposed Well: 1980' FNL & 1980'FWL, Section 1, T-22-S, R-30-E, Eddy County, New Mexico

2. Unprepared Ground Elevation: 3314'

3. The geologic name of the surface formation is See Archaeological Survey

4. Type of drilling tools will be rotary.

5. Proposed drilling depth is 7700'.

6. The estimated tops of important geologic markers are as follows:

<u>Rustler</u>	<u>315'</u>	<u>Brushy Canyon</u>	<u>5980'</u>
<u>Salado</u>	<u>620'</u>	<u>Bone Springs</u>	<u>7650'</u>
<u>Delaware Mt.</u>	<u>3780'</u>		
<u>Cherry Canyon</u>	<u>4600'</u>		

7. The estimated depths at which anticipated water, oil, gas, or other mineral bearing formations are expected to be encountered are as follows:

Oil: Brushy Canyon 5980'

8. The proposed casing program is as follows:

Surface String 13-3/8", 48#, set at 475'  
Intermediate String 8-5/8", 24#, set at 3700'.  
Production String 5-1/2", 14#, 15.5# set at 7700'.

9. Cement Program:  
Surface String - Cement to surface with 650 sacks Class C cement.

Intermediate String - Cemented to surface with 1200 sacks Class C.  
Production String - Cement with 900 sacks C - estimated top of cement 3500'.

- 10. The minimum specifications for pressure control equipment which are to be used, a schematic diagram thereof showing sizes, pressure ratings (or) API series and the testing procedure and testing frequency are attached.
- 11. The proposed mud program is attached (see Drilling Specialties mud letter).
- 12. The testing, logging, and coring programs are as follows:

D.S.T.'s or cores None

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Logs DIL-TD-3700±

---

Neutron Density TD - 3700'

---

Neutron Gamma Ray 0-TD

---

Dipmeter - Selective

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Special Tests: None

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- 13. Anticipate no abnormal pressures or temperatures to be encountered or any other potential hazards such as Hydrogen Sulfide Gas. Low risk H<sub>2</sub>S equipment will be used.
- 14. The anticipated starting date is immediately upon approval with duration of operations for approximately 30 days thereafter.
- 15. Water Supply: Hauled
- 16. Caliche for road and pad construction to be obtained from Federal pit from Section 11.

PROPOSED MUD PROGRAM  
LIVINGSTON RIDGE WELL NO. 7

DEPTH	MUD WEIGHT	VISCOSITY	FLUID LOSS	CL PPM	% SOLIDS	ADDITIVES
Surf - 475'	8.3-9.0 ppq	28-36 sec/1000 cc	-	-	-	Native Solids
475' - 3700'	10.0 ppq	29-32 sec/1000 cc	-	Saturated	-	Native Solids
3700' - 5700'	8.3-9.5 ppq	28-36 sec/1000 cc	-	-	-	
5700' - 7700'	8.5-9.0 ppq	32-38 sec/1000 cc	20 cc or less	-	-	Gel/Drispac Plus

Remarks: Use DBX dripped into flowline 10-15' upstream from lower end if extra settling of solids is desired while circulating the reserve.

The Mud Engineer shall include on each test report the materials used for the previous 24 hr. period. Twice weekly mail copies of the test reports to:

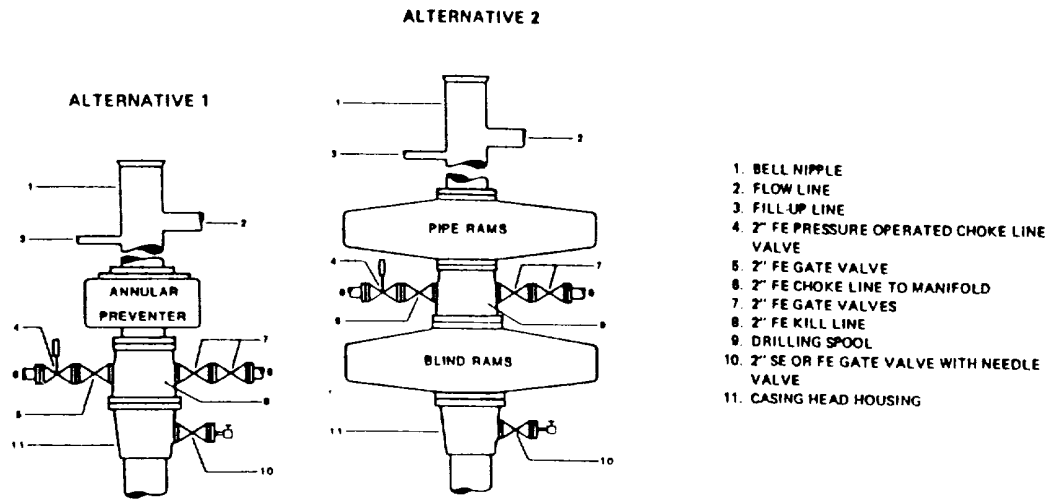
A. C. Sewell  
4001 Penbrook  
Odessa, Texas 79762

Send two copies of the Well Recap (Final Cost & Engineering Summaries) to A. C. Sewell at the above address.

regpro/jmap1/mudprog1



# FIELD PRACTICES AND STANDARDS



NOTE: THE DRILLING SPOOL MAY BE LOCATED BELOW BOTH SETS OF RAMS IF A DOUBLE PREVENTER IS USED AND IT DOES NOT HAVE SUITABLE OUTLETS BETWEEN RAMS

Figure 7-9. Standard Hydraulic Blowout Preventer Assembly (2 M or 3 M Working Pressure) Alternative 1

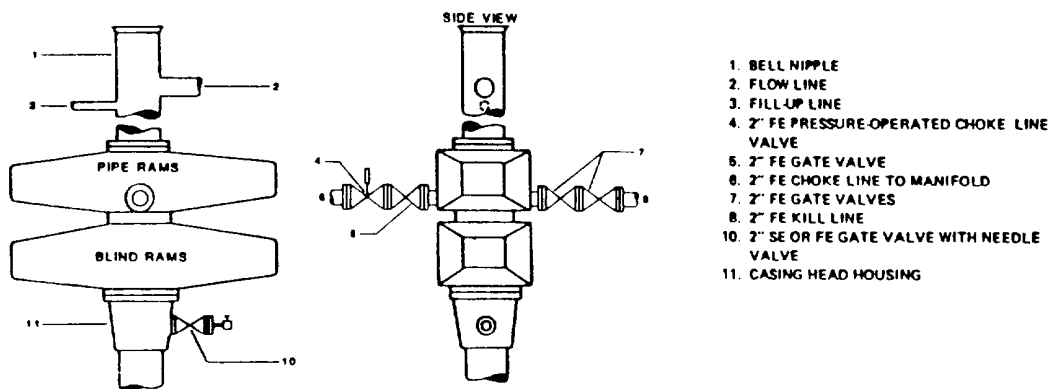


Figure 7-10. Standard Hydraulic Blowout Preventer Assembly (2 M or 3 M Working Pressure) Alternative 3 (without Drilling Spool)

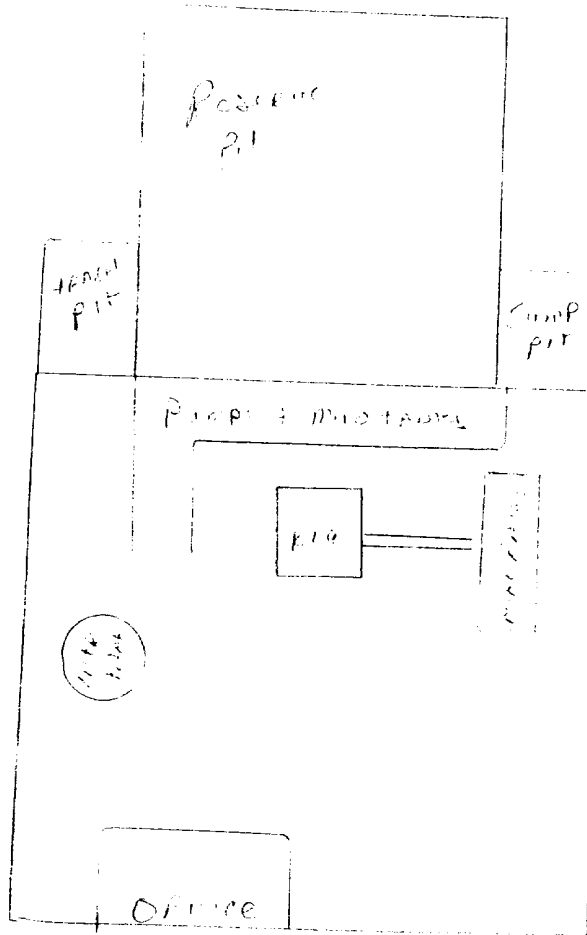
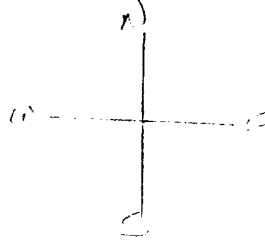




# PHILLIPS PETROLEUM COMPANY

HOBBS, NEW MEXICO 88240  
1625 WEST MARLAND

EXPLORATION AND PRODUCTION GROUP

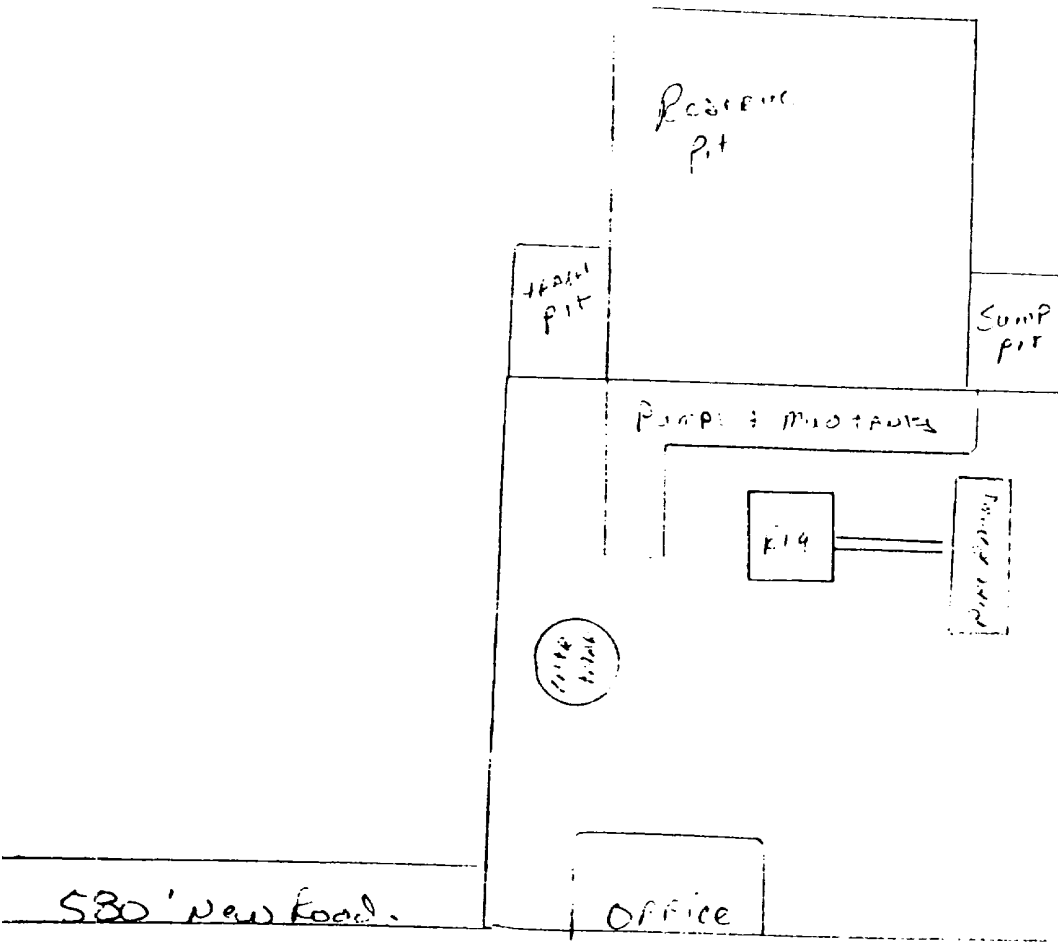
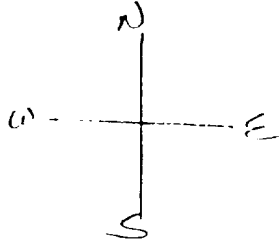




# PHILLIPS PETROLEUM COMPANY

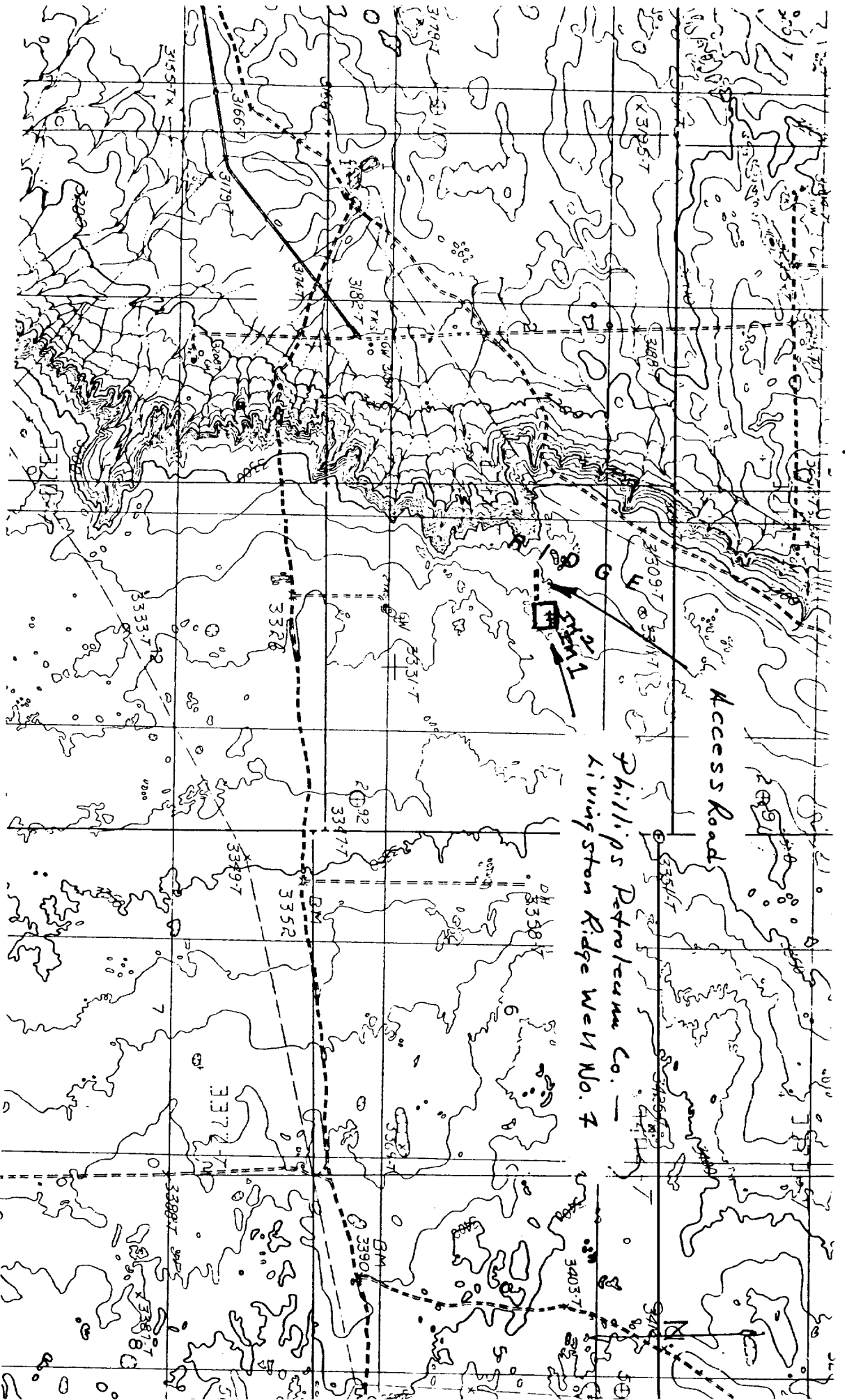
HOBBS, NEW MEXICO 88240  
1625 WEST MARLAND

EXPLORATION AND PRODUCTION GROUP

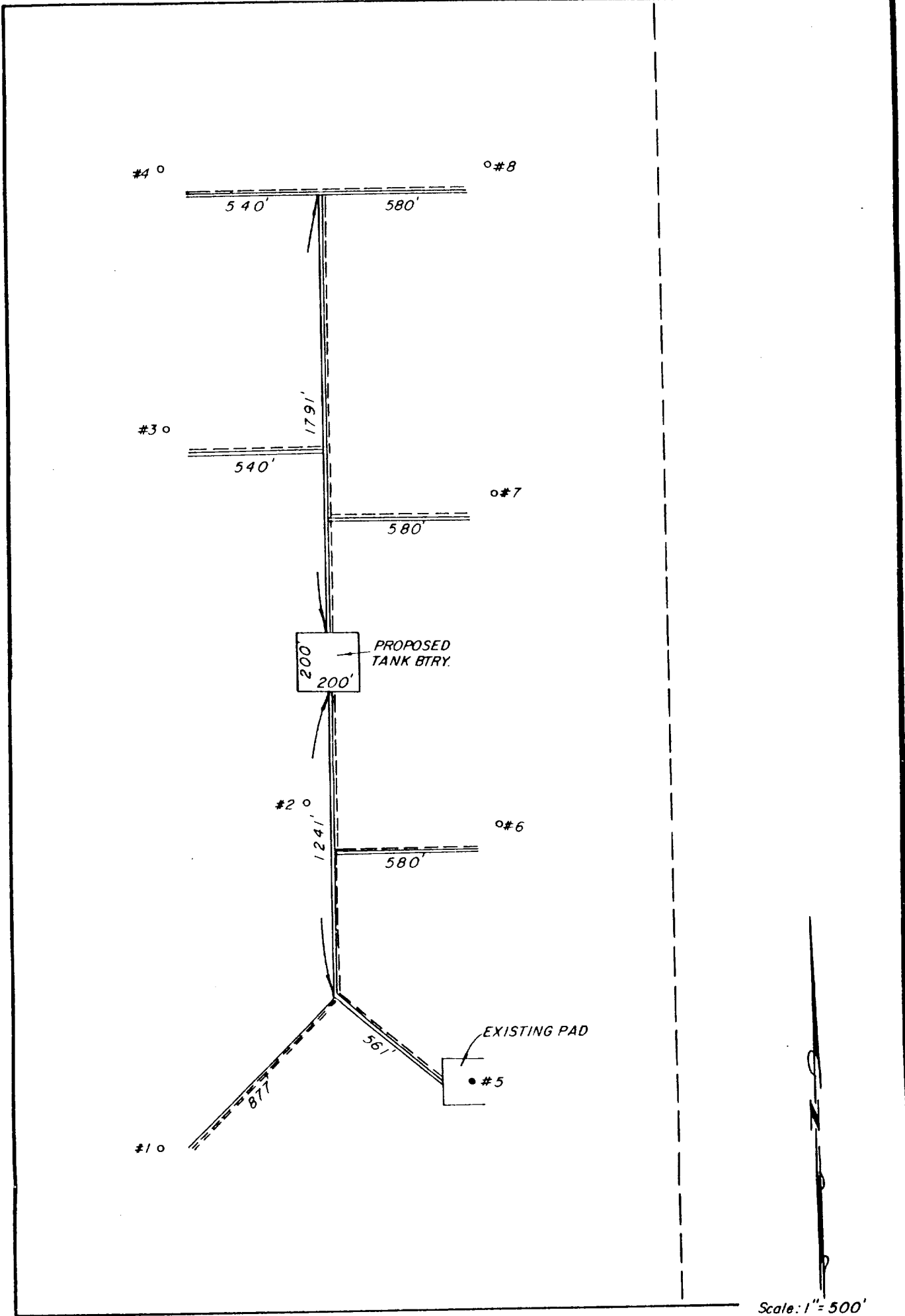


*Livingston Ridge # 7*

Fig. 3. USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1:24,000, 1985, Prov. Ed., showing PHILLIPS PETROLEUM COMPANY's proposed Livingston Ridge Well No. 7, 1980' FNL, 1980' FWL, and access road, Section 1, T22S, R30E, NMPM, Eddy County, NM



W/2 SEC.1, T-22-S, R-30-E, N.M.P.M., EDDY CO., NEW MEXICO



- LEGEND -

- #1 PROPOSED WELL
- PROPOSED LSE ROAD
- - - PROPOSED FLOW LINE, ONE FOR EACH WELL

PHILLIPS PETROLEUM COMPANY  
Odessa, Texas

PROPOSED LEASE EXPANSION IN:  
W/2 Sec.1, T-22-South, R-30-East, N. M. P. M.  
Eddy County, New Mexico

RICHARD B. DUNIVEN & CO. INC.  
REGISTERED PUBLIC SURVEYORS  
P. O. Box 80276    APRIL 3, 1990    915-687-0231  
Midland, Texas 79709



**NMAS**  
**New Mexico Archaeological Services, Inc.**

P.O. Box 1341  
Carlsbad, New Mexico 88221-1341  
(505) 887-7646 • FAX (505) 885-2587

3 May 1990

Reconnaissance  
Excavation  
Analysis  
Explanation  
Curation

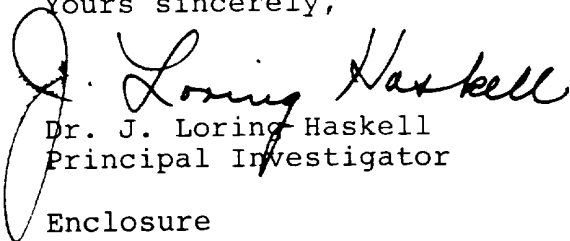
Mr. Wes Stinson  
PHILLIPS PETROLEUM COMPANY  
1625 West Marland  
Hobbs, New Mexico 88240

Dear Mr. Stinson:

Enclosed please find NMAS' Archaeological Clearance Report for PHILLIPS PETROLEUM COMPANY's proposed Livingston Ridge Well Nos. 4, 6, 7 and 8 and their associated access roads in Eddy County, New Mexico. Three isolated manifestations (IM) were recorded on the Livingston Ridge Well No. 4 survey. Two isolated manifestations (IM) were recorded during the Livingston Ridge Well No. 7 survey. No cultural properties were recorded during the Livingston Ridge Well Nos. 6 and 8 surveys. Clearance is suggested for these locations and their associated access roads.

If you have any questions pertaining to this report, please call my office. Thank you for asking NMAS to do these surveys.

Yours sincerely,



Dr. J. Loring Haskell  
Principal Investigator

Enclosure

cc: Mr. George Ruebelmann, BLM, Carlsbad

as

Archaeological Clearance Report

for

PHILLIPS PETROLEUM COMPANY

Livingston Ridge Well No. 4 and Access Road  
Livingston Ridge Well No.6  
Livingston Ridge Well No. 7 and Access Road  
Livingston Ridge Well No. 8 and Access Road

Submitted

By

Dr. J. Loring Haskell

Prepared

By

Dr. J. Loring Haskell  
Principal Investigator  
New Mexico Archaeological Services, Inc.  
Carlsbad, New Mexico  
3 May 1990

Permit Number: NMAS-2920-90-J

Report Number: NMAS-1990-06-MY

## ABSTRACT

New Mexico Archaeological Services, Inc., representing PHILLIPS PETROLEUM COMPANY, undertook a Class III survey of Bureau of Land Management land scheduled to be impacted by the construction of four drill locations and their associated access roads. Field work was conducted under sunny, partly cloudy conditions with moderate easterly winds throughout the day. Each location will measure 400 X 40 ft (actual area surveyed 4.44 acres). The Livingston Ridge Well No. 4 access road will measure 100 X 4700 ft (actual area surveyed 10.78 acres). The Livingston Ridge Well No. 6 location will be situated next to a lease road. The Livingston Ridge Well No. 7 access road will measure 100 X 580 ft (actual area surveyed 1.33 acres). The Livingston Ridge Well No. 8 access road will measure 100 X 580 ft (actual area surveyed 1.33 acres). Total surveyed acreage 31.20 acres. They will be situated in Section 1, T22S, R30E, NMPM, Eddy County, New Mexico. Three isolated manifestations (IM) were recorded during the Livingston Ridge Well No. 4 survey. Two isolated manifestations (IM) were recorded during the Livingston Ridge Well No. 7 survey. No cultural properties were recorded during the Livingston Ridge Well Nos. 6 and 8 surveys. Clearance is suggested for these locations and their associated roads.



## Introduction

On 30 April and 1 May 1990, New Mexico Archaeological Services, Inc., (NMAS), Carlsbad, (Permit Number: 14-2920-90-J), undertook for PHILLIPS PETROLEUM COMPANY, four archaeological surveys of federal land administered by the Bureau of Land Management in Eddy County, New Mexico. Reconnoitered areas will be impacted by the construction of four drill locations and their associated access roads. These surveys were undertaken by Dr. Haskell.

## Survey Technique

For these investigations, PHILLIPS PETROLEUM COMPANY's proposed locations were reconnoitered for evidence of man's past activities by walking them in series of 8.0 m wide, close interval (15° or less), zigzag transects. In addition, an added zone extending 20 ft on each side of the staked 400 X 400 ft locations, and lying outside the bounds of their proposed work areas, were reconnoitered by a similar means. The access roads were walked in two, 15 m wide transects. Lath and/or flags are considered to be the center of the proposed roads. Methodologically, these procedures served to promote optimal conditions for the visual examination of the areas to be impacted by construction-related activities. Field work was conducted under sunny, partly cloudy conditions with moderate winds throughout the day. Ground visibility ranges between 75 and 85%. Field time five hours.

Livingston Ridge Federal Well No. 4

## Location

The proposed location will measure 400 X 400 ft (actual

area surveyed 4.44 acres) on federal land and will be situated 660 ft from the north line and 660 ft from the west line.

Section 1, T22S, R30E, NMPM, Eddy County, NM

Thus it will be situated in the:

NW $\frac{1}{4}$ NW $\frac{1}{4}$ , Section 1, T22S, R30E, NMPM, Eddy County, NM

The associated access road will measure approximately 100 X 4700 ft (actual area surveyed 10.79 acres) and will be situated in the:

NW $\frac{1}{4}$ NW $\frac{1}{4}$ , Section 1, T22S, R30E, NMPM, Eddy County, NM  
 NE $\frac{1}{4}$ NW $\frac{1}{4}$ , Section 1, T22S, R30E, NMPM, Eddy County, NM  
 SE $\frac{1}{4}$ NW $\frac{1}{4}$ , Section 1, T22S, R30E, NMPM, Eddy County, NM  
 NE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 1, T22S, R30E, NMPM, Eddy County, NM  
 SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 1, T22S, R30E, NMPM, Eddy County, NM

Map Reference: USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1985, Prov. Ed.

#### Level of Previous Impact

The proposed location is crossed on the southeast by a fence line and on the west by a two-track road. The road will cross two, two-track roads.

#### Environmental Setting

PHILLIPS PETROLEUM COMPANY's proposed location, situated on an aeolian surface, will be located immediately east of Livingston Ridge. Minor dunes, to 0.35 m in height, are characteristic of the surface. Areal soils fall within the Typic Torripsamment subgroup. Rills and minor gullies braid the coeval surface and discharge to the west-southwest over the Livingston Ridge escarpment. Water, in the form of seeps and springs, occurs along the base of the escarpment and elsewhere to the west within the Nash Draw catchment. Elevation is 3307 ft. Slope is 1°. Aspect is west, northwest and southwest (150°).

The desert scrub formation is made up of javelina bush, mesquite, allthorn, desert sumac, purple prickly pear, Christmas cholla, Englemann prickly pear, pitaya, feather dalea, range ratany, prickle-leaf dogweed, poverty threeawn, mesa dropseed, and fluff grass.

#### Cultural Resources

Prefield: 27 April 1990, Section 1 (two archaeological sites), T22S, R30E, Arita K. Slate.

NM-06-4683 is situated within 4400 ft of the proposed location.

NM-06-4682, incorrectly located, is within 700 ft of the proposed location.

During the course of this survey, three isolated manifestations (IM) were recorded.

#### Isolated Manifestation (IM)

IM 1, consisting of three pieces of fire-cracked caliche, is situated on an aeolian surface at a point 2200 ft south of the northernmost point of the road and 18 ft east of the center of the road. There is no evidence of additional remains. Associated plants include mesquite, plains yucca, mesa dropseed, and poverty threeawn. It is situated in the:

NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 1, T22S, R30E, NMPM, Eddy County, NM  
Map Reference: USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1985, Prov. Ed.

IM 2, consisting of one piece of fire-cracked caliche, is situated on an aeolian surface at a point 1500 ft of the northernmost point of the road and 10 ft west of center. There is no evidence of additional cultural properties. It is situated in the:

NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ , Section 1, T22S, R30E, NMPM, Eddy County, NM

Map Reference: USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1985, Prov. Ed.

IM 3, consisting of one light gray, cryptocrystalline chert, secondary decortication flake, 43 X 37 X 13 mm with bulb, platform and 75% cortex, is situated on an aeolian landform at a point 800 ft south of the northernmost point of the road and 50 ft west of center. There is no evidence of buried remains. It is situated in the:

NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ , Section 1, T22S, R30E, NMPM, Eddy County, NM

Map Reference: USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1985, Prov. Ed.

Land usage along Livingston Ridge was intense during Eastern Jornada Mogollon times as well as during the Late Archaic. Areal archaeological sites are of the special activities zone type.

#### Recommendations

NMAS recommends clearance for PHILLIPS PETROLEUM COMPANY's proposed Livingston Ridge Federal Well No. 4 and its access road and suggests that work-related activities proceed in accordance with company plans (Fig. 1). Clearance, of course, is granted by the Bureau of Land Management. If additional cultural resources are encountered during construction, the BLM and NMAS should be notified immediately. Duned settings are notorious for covering and uncovering cultural properties.

#### Livingston Ridge Well No. 6

#### Location

The proposed location will measure 400 X 400 ft (actual area surveyed 4.44 acres) on federal land and will be situated

Phillips Petroleum Co. -  
Livingston Ridge Well No. 4

IM 3  
IM 2  
IM 1

Access Rd.

Beginning Point of Ad.

Fig. 1. USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1:24,000, 1985, Prov. Ed., showing PHILLIPS PETROLEUM COMPANY'S proposed Livingston Ridge Well No. 4, 660' FNL, 660' FWL, and access road, Section 1, T22S, R30E, NMPM, Eddy County, NM

1980 ft from the south line and 1980 ft from the west line.

Section 1, T22S, R30E, NMPM, Eddy County, NM

Thus it will be situated in the:

NE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 1, T22S, R30E, NMPM, Eddy County, NM

The proposed location will be situated next to an access road on the southwest.

Map Reference: USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1985, Prov. Ed.

#### Level of Previous Impact

The site of the proposed location has not been previously impacted by mechanical means.

#### Environmental Setting

PHILLIPS PETROLEUM COMPANY's proposed location will be situated on an aeolian landform due east of Livingston Ridge. Locally, the coeval surface is distinguished by a system of moderate-sized, coppice dunes (1.0 to 2.0 m in height) and closed, hemispherically shaped, deflation basins. Surficial deposits are made up of loose, non-calcareous, coarse-grained, sandy loams and loamy sands. Caliche and chert gravels commonly occur on deflated surfaces. Taxonomically, pedons fall within the Typic Torripsamment subgroup. Depositionally, the present surface is subject to aeolian processes. Water, while scarce, is available in the form of seeps and springs along the base of the Livingston Ridge. Elevation is 3307ft. Slope is 1°. Aspect is multiple (360°).

The scrub formation is made up of mesquite, sand sage, plains yucca, shinnery oak, leather-leaf croton, broom snakeweed, widow's tears, fourpoint evening primrose, poverty threeawn, sand muhly, bush muhly, mesa dropseed, and sandbur.

## Cultural Resources

Prefield: 27 April 1990, Section 1 (two archaeological sites), T22S, R30E, Arita K. Slate.

NM-06-4683 is situated within 1800 ft of the proposed location.

NM-06-4682, incorrectly located, is situated within 1650 ft of the proposed location.

No cultural properties were recorded during this survey.

Their absence is due to the scantiness of local siliceous lithic sources as well as the relatively open character of the landform itself. Areal land usage, however, was intensive during Eastern Jornada Mogollon times. Archaeological sites, should they occur, are of the special activities zone type.

## Recommendations

NMAS recommends clearance for PHILLIPS PETROLEUM COMPANY's proposed Livingston Ridge Well No. 6 and suggests that work-related activities proceed in accordance with company plans (Fig. 2). Clearance, of course, is granted by the Bureau of Land Management. If cultural resources are encountered during construction, the BLM and NMAS should be notified immediately. Duned settings are notorious for covering and uncovering cultural properties.

Livingston Ridge Well No. 7

## Location

The proposed location will measure 400 X 400 ft (actual area surveyed 4.44 acres) on federal land and will be situated 1980 ft from the north line and 1980 ft from the west line.

Section 1, T22S, R30E, NMPM, Eddy County, NM

Thus it will be situated in the:

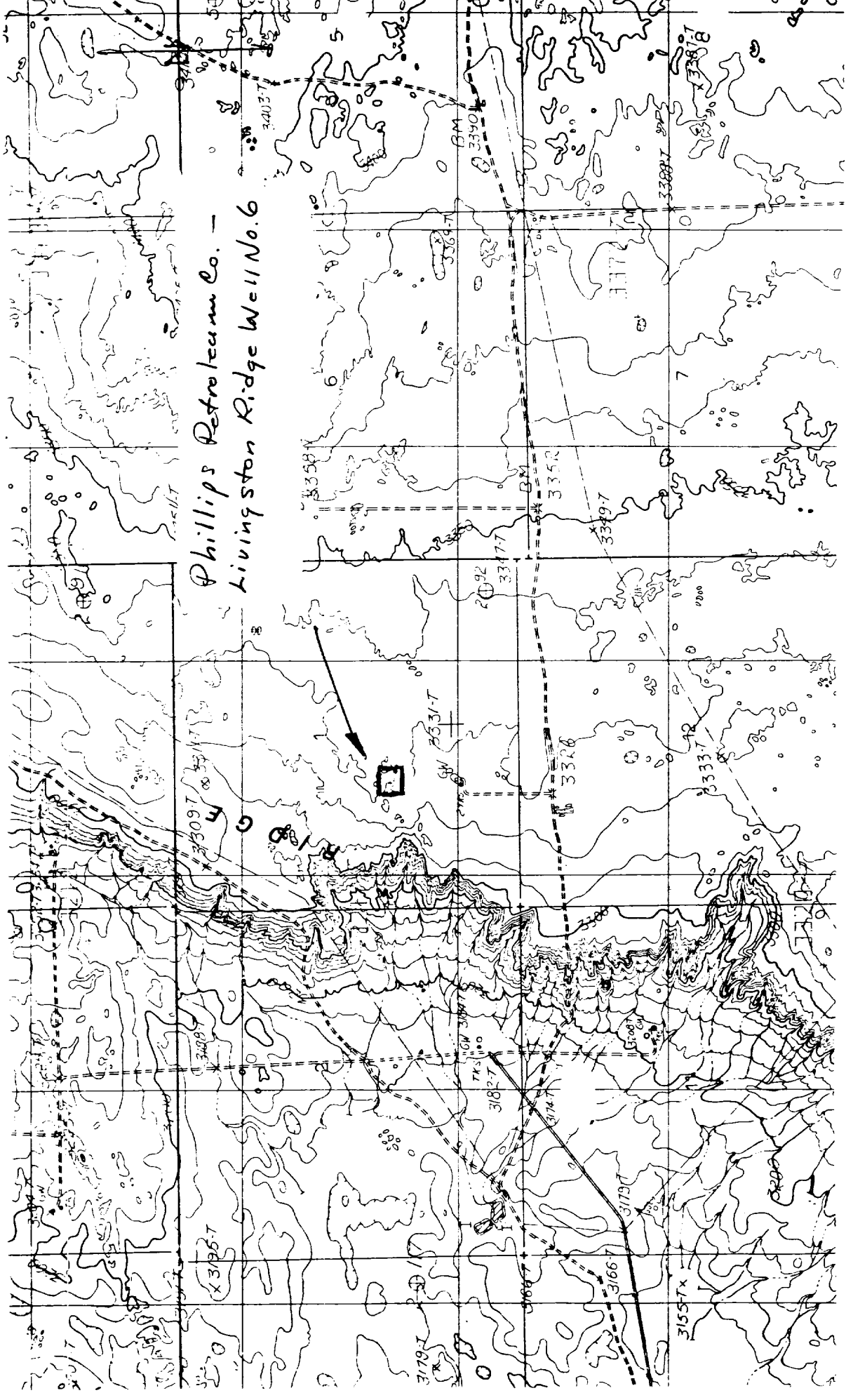


Fig. 2. USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1:24,000, 1985, Prov. Ed., showing PHILLIPS PETROLEUM COMPANY'S proposed Livingston Ridge Well No. 6, 1980' FSL, 1980' FWL, Section 1, T22S, R30E, NMMP, Eddy County, NM



SE¼NW¼, Section 1, T22S, R30E, NMPM, Eddy County, NM

The associated access road will measure approximately 100 X 580 ft (actual area surveyed 1.33 acres) and will be situated in the:

SE¼NW¼, Section 1, T22S, R30E, NMPM, Eddy County, NM

Map Reference: USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1985, Prov. Ed.

#### Level of Previous Impact

The sites of the proposed location and access road have not been previously impacted by mechanical means.

#### Environmental Setting

PHILLIPS PETROLEUM COMPANY's proposed location will be situated on a duned landform. Coppice dunes range from 0.70 to 1.50 m in height on the west to upwards of 4.0 m on the east. Interdunal areas are interconnected and subject to sheetwash. Surficial deposits, dominated by the sand separate, are made up of loose, non-calcareous, coarse-grained, sandy loams and loamy sands. Pedons are assignable to the Typic Torripsamment subgroup. The coeval surface is subject to the combined effects of colluvial- and aeolian-processes. Water is locally scarce albeit available in the form of seeps and springs along the base of Livingston Ridge to the west. Elevation is 3314 ft. Slope is 0.85°. Aspect is multiple (360°).

The scrub formation is made up of mesquite, shinnery oak, sand sage, leather-leaf croton, broom snakeweed, sand leaf plant, Indian rush-pea, sand muhly, fluff grass, bush muhly, mesa dropseed and poverty threeawn.

## Cultural Resources

Prefield: 27 April 1990, Section 1, (two archaeological sites), T22S, R30E, Arita K. Slate.

NM-06-4683 is situated within 3400 ft of the proposed location.

NM-06-4682, incorrectly located, is situated within 1200 ft of the proposed location.

During the course of this survey, two isolated manifestations (IM) were recorded.

IM 1, consisting of one, very dark red, granular, quartzite, secondary decortication flake, 50 X 33 X 10 mm, with bulb, platform, 80% cortex and nibbled along its blade edge, is situated at a point 75 ft southwest of the northeastern corner. There is no evidence of buried remains. Associated plants include mesquite, broom snakeweed, leather-leaf croton, poverty threawn and mesa dropseed. It is situated in the:

SW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ , Section 1, T22S, R30E, NMPM, Eddy County, NM  
 Map Reference: USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1985, Prov. Ed.

IM 2, consisting of one, dark gray, cryptocrystalline, chert, secondary decortication flake, 40 X 22 X 10 mm, with bulb and platform, but lacking retouch, is situated at a point 125 ft north of center. There is no evidence of buried remains. Associated plants include mesquite, broom snakeweed, leather-leaf croton and poverty threawn. It is situated in the:

SW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ , Section 1, T22S, R30E, NMPM, Eddy County, NM  
 Map Reference: USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1985, Prov. Ed.

Land usage focused on hunting- and gathering activities

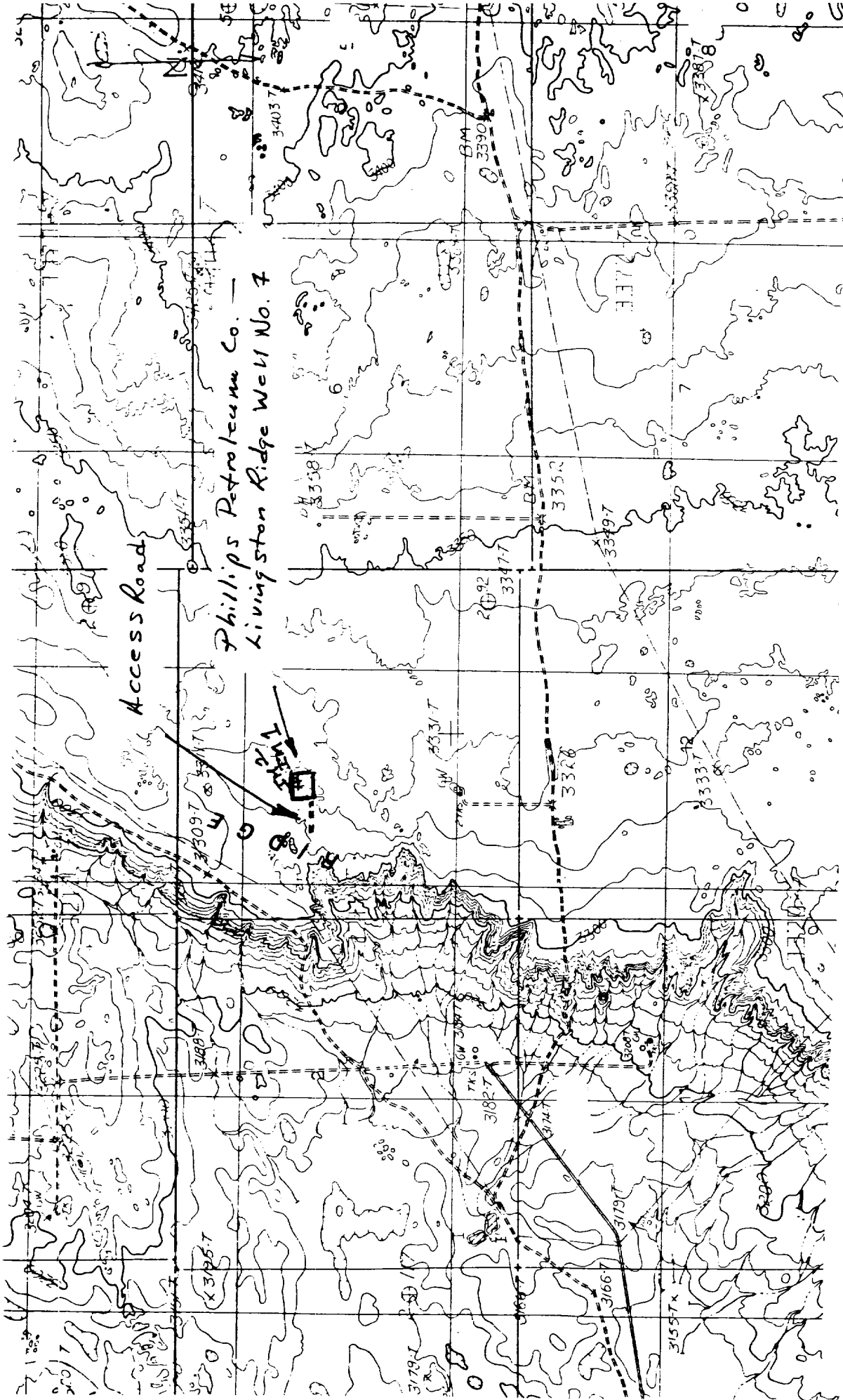


Fig. 3. USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1:24,000, 1985, Prov. Ed., showing PHILLIPS PETROLEUM COMPANY'S proposed Livingston Ridge Well No. 7, 1980' FNL, 1980' FWL, and access road, Section 1, T22S, R30E, NMPM, Eddy County, NM

### Environmental Setting

PHILLIPS' proposed location will be situated within a well-developed doline whose surface is overlain by an aeolian deposit. Low, coppice dunes and an interconnected network of interdunal areas are characteristic of the surface. Microrelief ranges between 0.30 and 0.50 m in height. Soils are made up of loamy sands and sandy loams. Lithic inclusions, generally scarce, are limited to occasional caliche gravels. Taxonomically, pedons fall within the Typic Torripsamment subgroup. Depositionally, the ceoval surface is subject to colluvial movement. Water is scarce. Nearest permanent water, seeps and springs, occurs within the Nash Draw catchment to the west. Drainage is of an internal nature owing to the karsted landform.

The scrub formation is made up of mesquite, javelina bush, plains yucca, purple prickly pear, leather-leaf croton, feather dalea, Indian rush-pea, bush muhly, poverty threeawn and six weeks grama.

### Cultural Resources

Prefield: 27 April 1990, Section 1 (two archaeological sites), T22S, R30E, Arita K. Slate.

NM-06-4683 is situated within 4800 ft of the proposed location.

NM-06-4682, incorrectly located, is situated within 2100 ft of the location.

During the course of this survey, no cultural properties were recorded. Their absence is due to the overall lack of locally available siliceous lithic material along the open character of the landform itself. Expected cultural properties, should they occur, should be of the isolated type. Remains of this nature

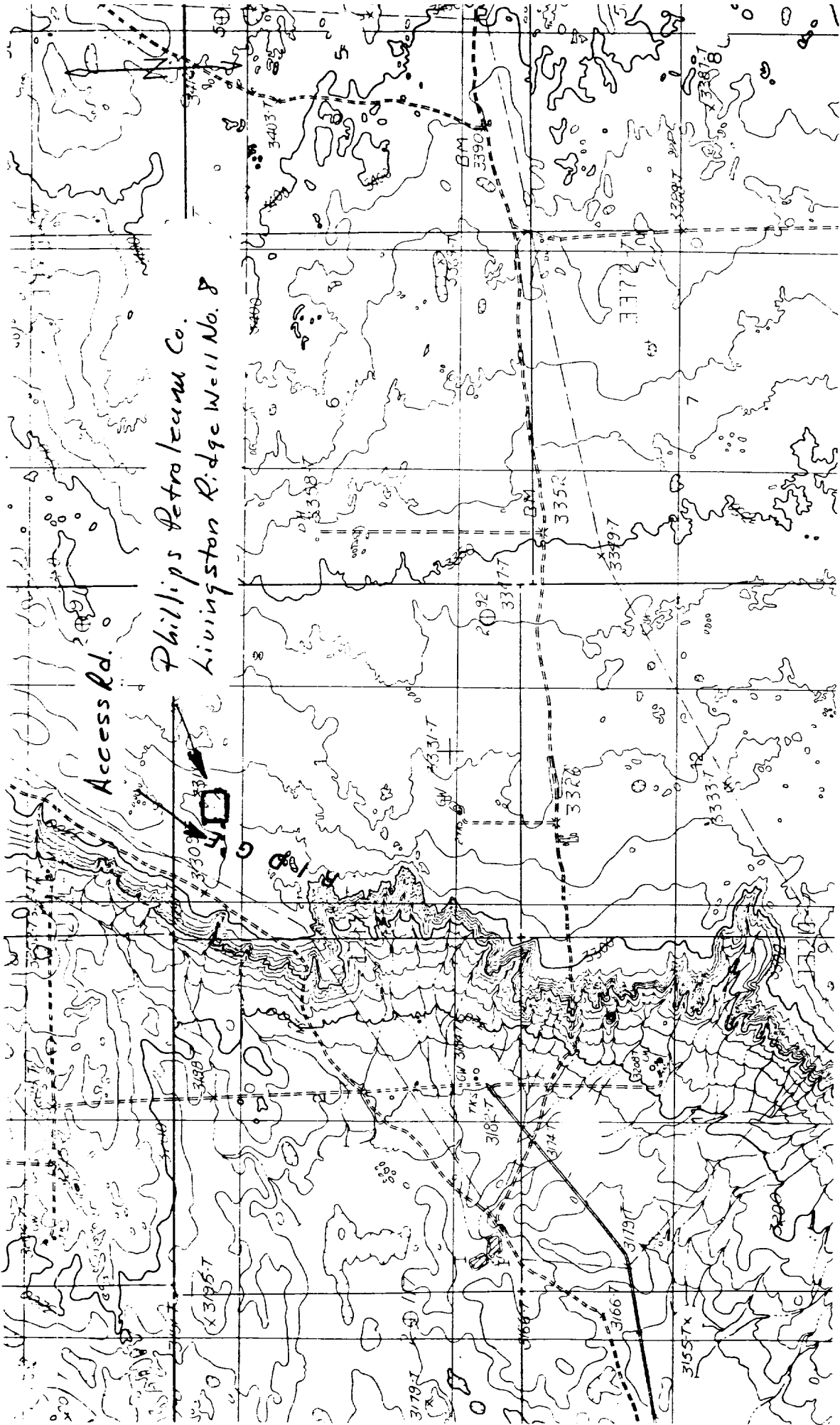


Fig. 4. USGS LIVINGSTON RIDGE QUADRANGLE, 7.5 Minute Series, 1;24,000, 1985, Prov. Ed., showing PHILLIPS PETROLEUM COMPANY's proposed Livingston Ridge Well No. 8, 660' FNL, 1980' FWL, and access road, Section 1, T22S, R30E, NMPM, Eddy County, NM

reflect en passant utilization of the landform in the past.

#### Recommendations

NMAS recommends clearance for PHILLIPS PETROLEUM COMPANY's proposed Livingston Ridge Well No. 8 and its access road and suggests that work-related activities proceed in accordance with company (Fig. 4). Clearance, of course, is granted by the Bureau of Land Management. If cultural resources are encountered during construction, the BLM and NMAS should be notified immediately. Duned settings are notorious for covering and uncovering cultural properties.