

Form 3160-3
(April 2004)

OCD-ARTESIA



ATS-07-619

HIGH CAVEKARST

RESUBMITTAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB NO. 1004-0137
Expires March 31, 2007

SEP 19 2007
OCD-ARTESIA

1a. Type of Work: ☒ DRILL ☐ REENTER
1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other ☐ Single Zone ☐ Multiple Zone
2. Name of Operator

Yates Petroleum Corporation 25575
3a. Address 105 South Fourth Street, Artesia New Mexico 88210
3b. Phone No. (include area code) (505) 748-1471

4. Location of well (Report location clearly and in accordance with any State requirements. *)
At surface Carlsbad Controlled Water Basin
990' FNL and 660' FWL, Unit D
At proposed prod zone same as above

14. Distance in miles and direction from the nearest town or post office*
Approximately 30 miles SW of Artesia, New Mexico

15. Distance from proposed* location to nearest property or lease line, ft (Also to nearest drlg unit line, if any) 990'	16. No. of acres in lease 2189.42	17. Spacing Unit dedicated to this well 320 - W/2
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 3000'	19. Proposed Depth 9500'	20. BLM/ BIA Bond No on file NATIONWIDE BOND #NMB000434
21. Elevations (Show whether DF, RT, GR, etc.) 3751' GL	22. Aproximate date work will start* ASAP	23. Estimated duration 30 Days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1 shall be attached to this form:

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by existing bond on file(see item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification. |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/ or plans as may be required by the a authorized officer. |

25. Signature	Name (Printed/ Typed) Cy Cowan	Date 8/9/2007
Title Regulatory Agent		

Approved By (Signature)	Name (Printed/ Typed)	Date SEP 14 2007
Title FIELD MANAGER		Office CARLSBAD FIELD OFFICE

Application approval does not warrant or c operations thereon.

Conditions of approval, if any, are attache
Title 18 U S C. Section 1001 and Title 43 U
States any false, fictitious or fraudulent sta

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

If earthen pits are used in
association with the drilling of this
well, an OCD pit permit must be
obtained prior to pit construction.

ghts in the subject lease which would entitle the applicant to cc
APPROVAL FOR TWO YEARS

and willfully to make to any department or agency of the Unite
on.

APPROVAL SUBJECT TO
GENERAL REQUIREMENTS
AND SPECIAL STIPULATIONS
ATTACHED

/District I

1625 N. French Dr., Hobbs, NM 88240

District II

1301 W. Grand Avenue, Artesia, NM 88210

District III

1000 Rio Brazos Rd., Aztec, NM 87410

District IV

1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102

Revised October 12, 2005

Submit to Appropriate District Office

State Lease - 4 Copies

Fee Lease - 3 Copies

☐ AMENDED REPORT**WELL LOCATION AND ACREAGE DEDICATION PLAT**

¹ API Number	² Pool Code 74640	³ Pool Name Undes. Cemetary, Morrow
⁴ Property Code 17349	⁵ Property Name DIAMOND AKI FEDERAL	⁶ Well Number 5
⁷ OGRID No. 025575	⁸ Operator Name YATES PETROLEUM CORPORATION	⁹ Elevation 3751'

¹⁰ Surface Location

UL or lot no. D	Section 34	Township 20S	Range 24E	Lot Idn	Feet from the 990	North/South line NORTH	Feet from the 660	East/West line WEST	County EDDY
---------------------------	----------------------	------------------------	---------------------	---------	-----------------------------	----------------------------------	-----------------------------	-------------------------------	-----------------------

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
¹² Dedicated Acres 320 W/2	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.						

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

	17 OPERATOR CERTIFICATION	
	<i>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division</i>	
	<i>Cy Cowan</i> Signature	8/9/07 Date
	Cy Cowan Printed Name Regulatory Agent Title	
	18 SURVEYOR CERTIFICATION	
	<i>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 belief.</i>	
	Date of Survey Signature and Seal of Professional Surveyor REFER TO ORIGINAL PLAT	
	Certificate Number	

District I
1625 N. French Dr., Hobbs, NM 88249

District II
811 South First, Artesia, NM 88210

District III
1800 Rio Brazos Rd., Aztec, NM 87410

District IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources

OIL CONSERVATION DIVISION
2040 South Pacheco
Santa Fe, NM 87505

Form C-102
Revised March 17, 1999

Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number		Pool Code	Pool Name
Property Code		Property Name	Well Number
DIAMOND AKI FEDERAL			5
OGRID No.		Operator Name	Elevation
025575		YATES PETROLEUM CORPORATION	3751.

Surface Location

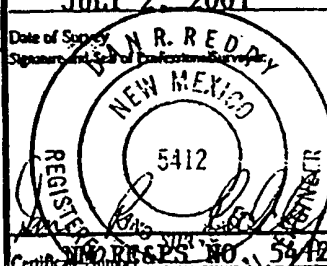
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	34	20-S	24-E		990	NORTH	660	WEST	EDDY

Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
320.00			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<div>16</div> <div>990'</div> <div>660'</div> <div>NM-045276</div> <div>Diamond AKI FED #2</div>					OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief. <div>Signature: <i>Cy Cowan</i></div> <div>Printed Name: Cy Cowan</div> <div>Title: Regulatory Agent</div> <div>Date: July 19, 2001</div>
					SURVEYOR CERTIFICATION 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 belief. JULY 2, 2001 Date of Survey Signature and Seal of Professional Surveyor: <div></div>

YATES PETROLEUM CORPORATION
Diamond AKI Federal #5
 990' FNL & 660' FWL
 Sec. 34-T20S-R24E
 Eddy County, New Mexico

1. The estimated tops of geologic markers are as follows:

San Andres	570'	Oil Pay	Canyon Dolomite	7670'	Gas Pay
Glorietta	2060'	Oil Pay	Strawn	8200'	Gas Pay
Bone Spring	3580'	Gas Pay	Atoka	8820'	Gas Pay
Wolfcamp	5640'	Gas Pay	Morrow	8990'	Gas Pay
Cisco Canyon	7520'	Gas Pay	TD	9500'	Gas Pay

2. The estimated depths at which anticipated water, oil or gas formations are expected to be encountered:

Water: Approx 200' - 300'
 Oil or Gas: See Above.

3. Pressure Control Equipment: BOPE will be installed on the 9 5/8" casing and rated for 3000 BOP systems will be consistent with API RP 53. Pressure tests will be conducted before drilling out from under all casing strings which are set and cemented in place. Blowout Preventor controls will be installed prior to drilling the surface plug and will remain in use until the well is completed or abandoned. Preventors will be inspected and operated at least daily to ensure good mechanical working order, and this inspection recorded on the daily drilling report. See Exhibit B.

Auxiliary Equipment:

A. Auxiliary Equipment: Kelly cock, pit level indicators, flow sensor equipment and a sub with full opening valve to fit the drill pipe and collars will be available on the rig floor in the open position at all times for use when kelly is not in use.

4. THE PROPOSED CASING AND CEMENTING PROGRAM:

A. Casing Program: (All New)

<u>Hole Size</u>	<u>Casing Size</u>	<u>Wt./Ft</u>	<u>Grade</u>	<u>Thread</u>	<u>Interval</u>	<u>Length</u>
14 3/4"	9 5/8"	36#	J-55	ST&C	0-1100'	1100'
8 3/4"	7"	26#	J-55	LT&C	0-400'	400'
8 3/4"	7"	23#	J-55	LT&C	400'-5200'	4800'
8 3/4"	7"	26#	J-55	LT&C	5200'-7300'	2100'
8 3/4"	7"	26#	N-80	LT&C	7300'-9500'	2200'

Minimum Casing Design Factors: Collapse 1.125, Burst 1.0, Joint Strength 1.8

B. CEMENTING PROGRAM:

Surface casing: 200 sx Thixad + 1% CaCl₂ + 10#/sx Gilsonite+ ¼# Celloflake (YLD 1.52, WT 14.6). 800 sx Lite "C" (YLD 2.0, WT 12.5). Tail in w/200 sx C+2% CaCl₂ (YLD 1.34, WT 14.8).

Production Casing: Lead w/750 sx Lite "H" (YLD 1.99, WT 12.4). Tail in w/400 sx super 'C' modified. (YLD 1.57, WT 13).

5. Mud Program and Auxiliary Equipment:

<u>Interval</u>	<u>Type</u>	<u>Weight</u>	<u>Viscosity</u>	<u>Fluid Loss</u>
Spud to 1100'	FW Gel/LCM	8.3-8.6	30	N/C
1100'-5200'	FW	8.3-8.6	28	N/C
5200'-7400'	Cut Brine	9.0-9.2	29	N/C
7400'-8000'	Cut Brine/Starch	9.0-9.3	30-34	N/C
8000'-9500'	Salt Gel/Starch	9.3-9.8	32-36	<10cc

Sufficient mud material(s) to maintain mud properties, control lost circulation and contain a blow out will be available at the well site during drilling operations. Mud will be checked hourly by rig personnel.

6. EVALUATION PROGRAM:

Samples: 10' samples from 3500' to TD.

Logging: Platform Express, Possible FMS, Rotary Sidewall cores.

Coring: AS warranted.

DST's: As warranted, possible in Morrow.

7. Abnormal Conditions, Bottom hole pressure and potential hazards:
Anticipated BHP:

From: O	TO: 1100'	Anticipated Max. BHP:	500	PSI
From: 1100'	TO: 9500'	Anticipated Max. BHP:	4700'	PSI

Abnormal Pressures Anticipated: None

Lost Circulation Zones Anticipated: None.

H₂S Zones Anticipated: None

Maximum Bottom Hole Temperature: 165° F

8. ANTICIPATED STARTING DATE:

Plans are to drill this well as soon as possible after receiving approval. It should take approximately 20 days to drill the well with completion taking another 10 days.

Diamond AKI Federal #5 Production Casing Design

0 ft to 1,300 ft				Make up Torque ft-lbs			Total ft = 1,300
O.D. 7 inches	Weight 26 #/ft	Grade J-55	Threads LT&C	opt. 3670	min. 2750	mx. 4590	
Collapse Resistance 4,320 psi	Internal Yield 4,980 psi	Joint Strength 367 ,000 #		Body Yield 415 ,000 #		Drift 6.151	

1,300 ft to 5,100 ft				Make up Torque ft-lbs			Total ft = 3,800
O.D. 7 inches	Weight 23 #/ft	Grade J-55	Threads LT&C	opt. 3130	min. 2350	mx. 3910	
Collapse Resistance 3,270	Internal Yield 4,360 psi	Joint Strength 313 ,000 #		Body Yield 366 ,000 #		Drift 6.25	

5,100 ft to 7,200 ft				Make up Torque ft-lbs			Total ft = 2,100
O.D. 7 inches	Weight 26 #/ft	Grade J-55	Threads LT&C	opt. 3670	min. 2750	mx. 4590	
Collapse Resistance 4,320 psi	Internal Yield 4,980 psi	Joint Strength 367 ,000 #		Body Yield 415 ,000 #		Drift 6.151	

7,200 ft to 9,500 ft				Make up Torque ft-lbs			Total ft = 2,300
O.D. 7 inches	Weight 26 #/ft	Grade HCP-110	Threads LT&C	opt. 6930	min. 5200	mx. 8660	
Collapse Resistance 7,800 psi	Internal Yield 9,950 psi	Joint Strength 693 ,000 #		Body Yield 830 ,000 #		Drift 6.151	

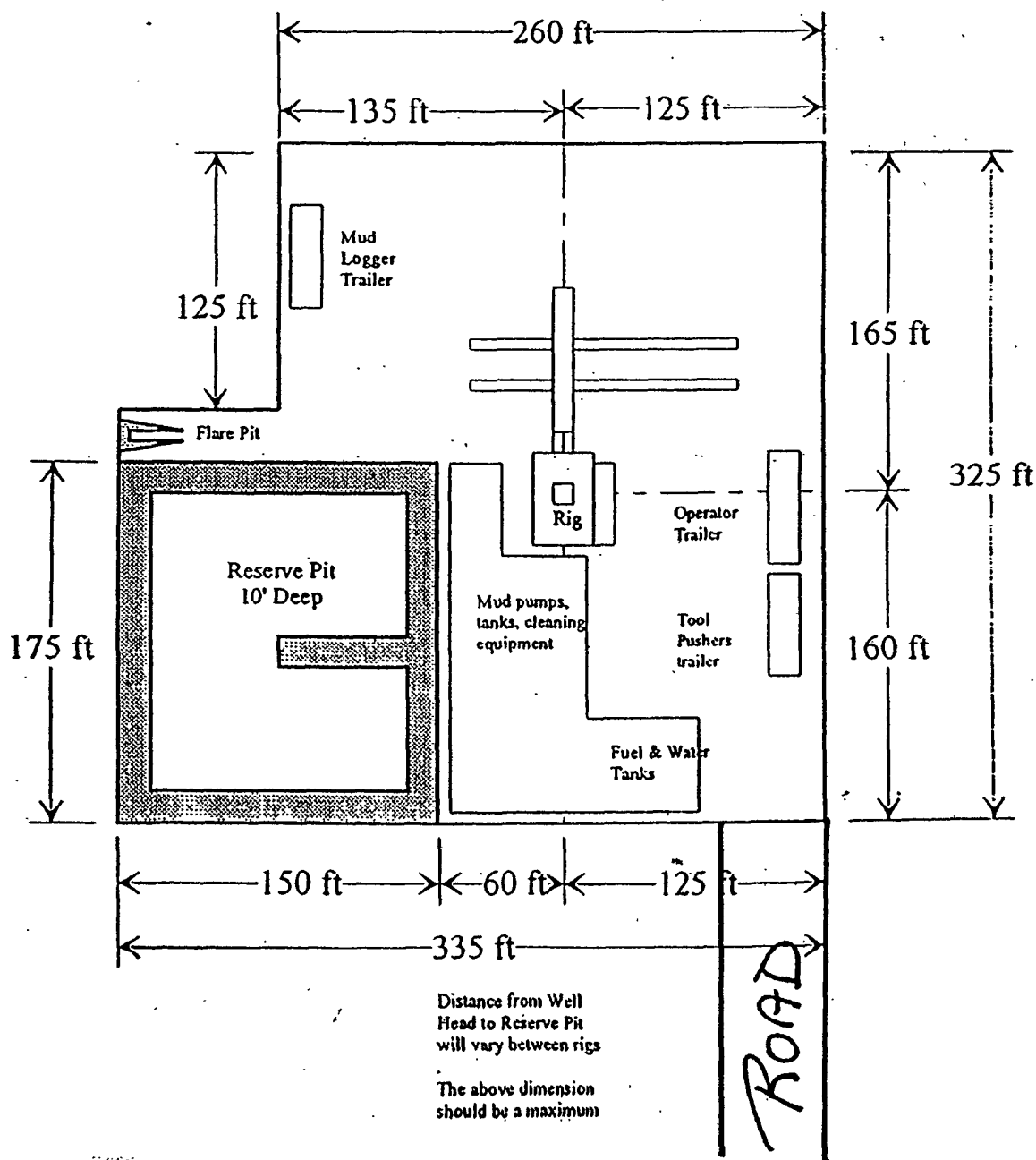
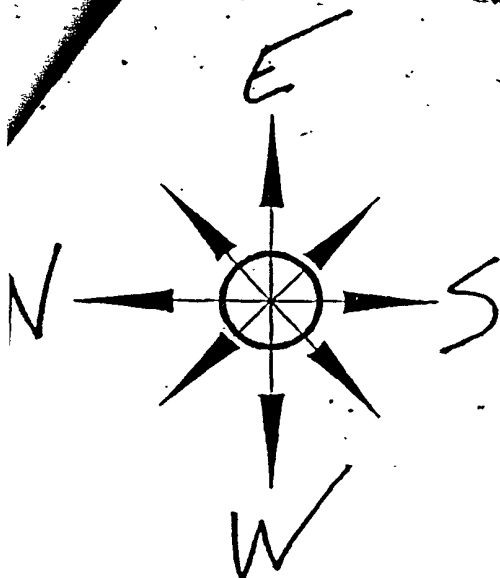
PB - L1

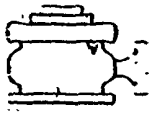
Yates Petroleum Corporation

Location Layout for Permian Basin

Up to 12,000'

Yates Petroleum Corporation
Diamond "AKI" Federal #5
990' FNL and 660' FWL
Section 34-T20S-R24E
Eddy County, New Mexico
NM-045276
Exhibit "C"

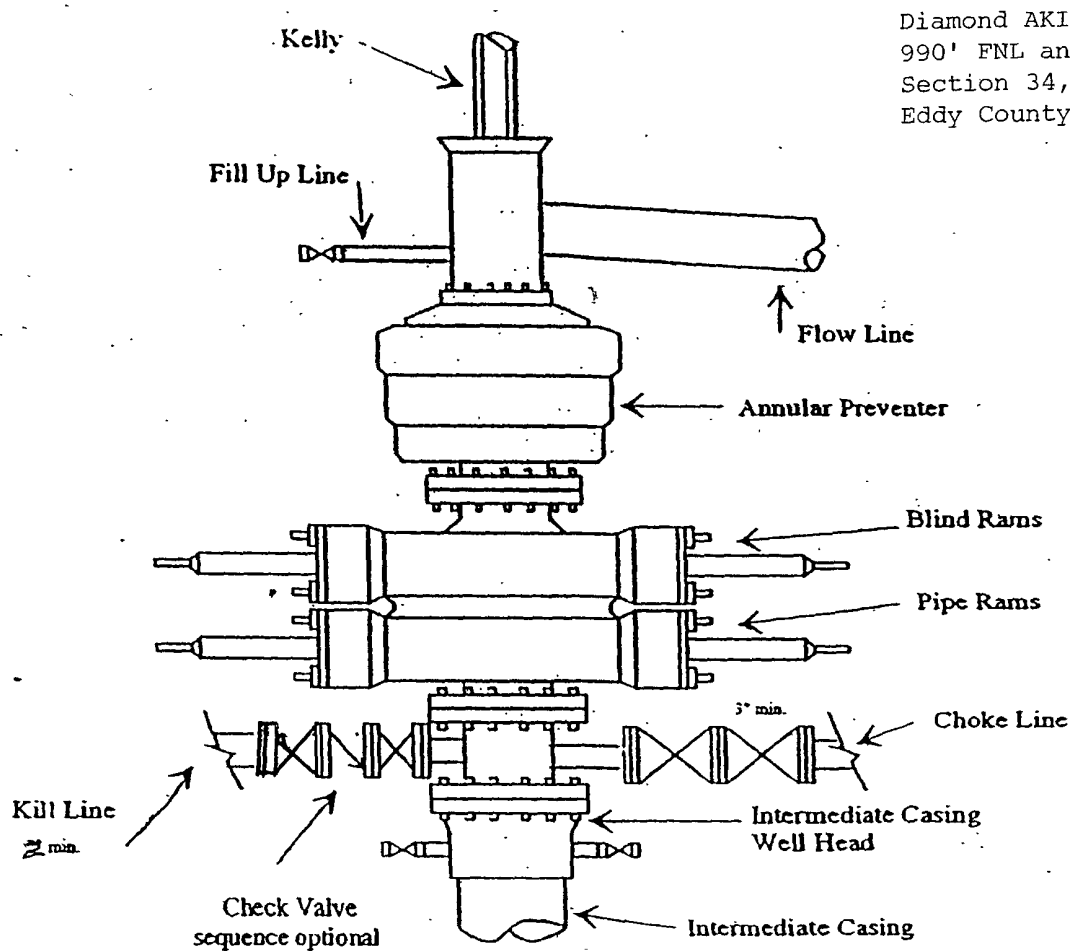




Yates Petroleum Corporation

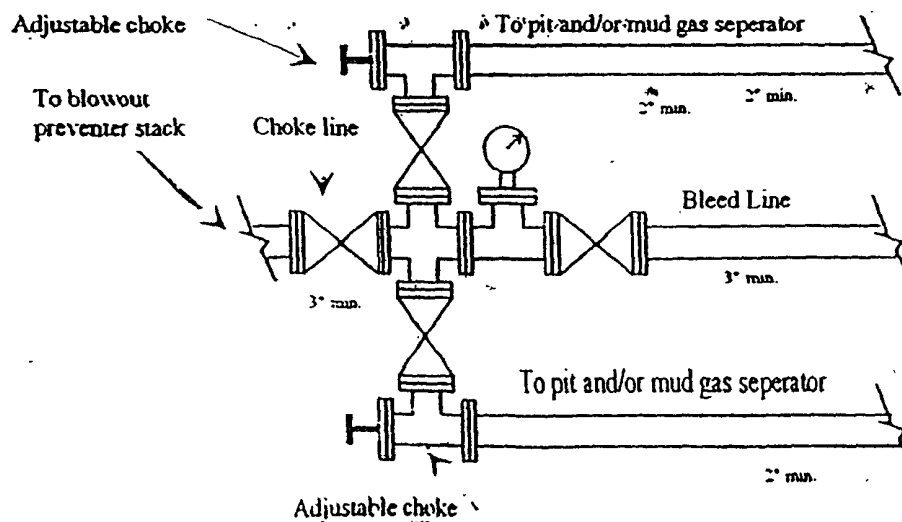
BOP-3

Typical 3,000 psi Pressure System Schematic Annular with Double Ram Preventer Stack



Diamond AKI Federal #5
990' FNL and 660' FWL
Section 34, T20S-R24E
Eddy County, New Mexico

Typical 3,000 psi choke manifold assembly with at least these minimum features



MULTI-POINT SURFACE USE AND OPERATIONS PLAN
Yates Petroleum Corporation
Diamond AKI Federal #5
990' FNL & 660' FWL
Sec. 34-T20S-R24E
Eddy County, New Mexico

This plan is submitted with Form 3160-3, Application for Permit to Drill, covering the above described well. The purpose of this plan is to describe the location of the proposed well, the proposed construction activities and operations plan, the magnitude of the surface disturbance involved and the procedures to be followed in rehabilitating the surface after completion of the operations, so that a complete appraisal can be made of the environmental effect associated with the operations.

1. EXISTING ROADS:

Exhibit A is a portion of the BLM map showing the well and roads in the vicinity of the proposed location. The proposed wellsite is located approximately 30 miles southwest of Artesia, New Mexico and the access route to the location is indicated in red and green on Exhibit A.

DIRECTIONS:

Go south of Artesia on Highway 285 to Rock Daisy Road. Turn west for approx. 8.5 miles then turn south and go approx. 3.6 miles on Sawbuck Road. Go south on caliche road for approx. 2 miles, turn west and go approx. 1 mile, turn northwest on two-track road for approx. 0.5 of a mile. The new road will start here.

2. PLANNED ACCESS ROAD.

- A. The proposed new access will be approximately 200 feet in length from the point of origin to the southwest corner of the drilling pad. The road will lie in a southeast northwest direction.
- B. The new road will be 14 feet in width (driving surface) and will be adequately drained to control runoff and soil erosion.
- C. The new road will be bladed with drainage on one side. Traffic turnout may be built.
- D. The route of the road is visible.
- E. Existing roads will be maintained in the same or better condition.

3. LOCATION OF EXISTING WELL

- A. There is drilling activity within a one-mile radius of the wellsite.
- B. Exhibit D shows existing wells within a one-mile radius of the proposed wellsite.

4. LOCATION OF EXISTING AND/OR PROPOSED FACILITIES

- A. There are production facilities on this lease at the present time.
- B. In the event that the well is productive, the necessary production facilities will be installed on the drilling pad. If the well is productive oil, a gas or diesel self-contained unit will be used to provide the necessary power. No power will be required if the well is productive of gas.

5. LOCATION AND TYPE OF WATER SUPPLY:

- A. It is planned to drill the proposed well with a fresh water system. The water will be obtained from commercial sources and will be hauled to the location by truck over the existing and proposed roads shown in Exhibit A.

6. SOURCE OF CONSTRUCTION MATERIALS:

Dirt contractor will locate closest pit and obtain any permits and materials needed for construction.

7. METHODS OF HANDLING WASTE DISPOSAL:

- A. Drill cuttings will be disposed of in the reserve pits.
- B. Drilling fluids will be allowed to evaporate in the reserve pits until the pits are dry.
- C. Water produced during operations will be collected in tanks until hauled to an approved disposal system, or separate disposal application will be submitted.
- D. Oil produced during operations will be stored in tanks until sold.
- E. Current laws and regulations pertaining to the disposal of human waste will be complied with.
- F. All trash, junk, and other waste materials will be contained in trash cages or bins to prevent scattering and will be removed and deposited in an approved sanitary landfill. Burial on site is not approved.

8. ANCILLARY FACILITIES: None.

9. WELLSITE LAYOUT:

- A. Exhibit C shows the relative location and dimensions of the well pad, the reserve pits, the location of the drilling equipment, rig orientation and access road approach.
- B. The reserve pits will be plastic lined.
- C. A 400' x 400' area has been staked and flagged.

10. PLANS FOR RESTORATION

- A. After finishing drilling and/or completion operations, all equipment and other material not needed for further operations will be removed. The location will be cleaned of all trash and junk to leave the wellsite in as aesthetically pleasing a condition as possible.
- B. Unguarded pits, if any, containing fluids will be fenced until they have dried and been leveled.
- C. If the proposed well is non-productive, all rehabilitation and/or vegetation requirements of the Bureau of Land Management will be complied with and will be accomplished as expeditiously as possible. All pits will be filled level after they have evaporated and dried.

11. SURFACE OWNERSHIP: Federal surface, Administered by the Bureau of Land Management, Carlsbad, New Mexico.

12. OTHER INFORMATION:

- A. Topography: Refer to the existing archaeological report for a description of the topography, flora, fauna, soil characteristics, dwellings, historical and cultural sites.
- B. The primary surface use is for grazing.

13. OPERATOR'S REPRESENTATIVE

- | | |
|---|---|
| A. Through A.P.D. Approval:

Cy Cowan, Regulatory Agent
Yates Petroleum Corporation
105 South Fourth Street
Phone (505) 748-1471 | B. Through Drilling Operations,
Completions and Production:
Ray Stall, Operations Manager
Yates Petroleum Corporation
Artesia, New Mexico 88210
Phone (505) 748-1471 |
|---|---|

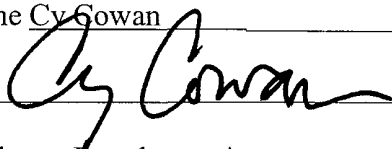
CERTIFICATION
YATES PETROLEUM CORPORATION
Diamond AKI Federal #5

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

Executed this 9th day of August, 2007.

Printed Name Cy Gowan

Signature



Position Title Regulatory Agent

Address 105 South Fourth Street, Artesia, NM 88210

Telephone 505-748-4372

Field Representative (if not above signatory) Jim Krogman

Address (if different from above) Same

Telephone (if different from above) 505-748-4215

E-mail (optional) cy@ypcnm.com

PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	YATES PETROLEUM CORP
LEASE NO.:	NM045276
WELL NAME & NO.:	5-DIAMOND AKI FEDERAL
SURFACE HOLE FOOTAGE:	990' FNL & 660' FWL
BOTTOM HOLE FOOTAGE:	SAME
LOCATION:	Section 34, T. 20 S., R 24E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
 - Lesser Prairie Chicken
 - Sand Dune Lizard
 - Aplomado Falcon
 - Cave/Karst
 - VRM
 - Cultural
- ☒ **Construction**
 - Notification
 - Topsoil
 - Reserve Pit
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- ☐ **Road Section Diagram**
- ☒ **Drilling**
- ☐ **Production (Post Drilling)**
 - Well Structures & Facilities
 - Pipelines
 - Electric Lines
- ☐ **Reserve Pit Closure/Interim Reclamation**
- ☐ **Final Abandonment/Reclamation**

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Conditions of Approval Cave and Karst

EA#: NM-520-07-1187

Lease #: NM-045276

**Yates Petroleum Corporation
Diamond AKI Fed. #5**

Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production.

Berming:

Any tank batteries will be constructed and bermed large enough to contain any spills that may occur.

Bermed areas will be lined with rip-stop padding to prevent tears or punctures in liners and lined with a permanent 20 mil plastic liner.

Closed Mud System with Cuttings Pit and Cuttings Removed:

A closed mud system or steel tanks will be utilized to drill the well. All fluids and cuttings will be hauled off site for disposal.

Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and ground water concerns:

Rotary Drilling with Fresh Water:

Rotary drilling techniques in cave or karst areas will include the use of fresh water as a circulating medium in zones where caves or karst features are expected. Use depth to the deepest expected fresh water as listed in the geologist report.

Casing:

All casing will meet or exceed National Association of Corrosion Engineers specifications pertaining to the geology of the location and be run to American Petroleum Institute and BLM standards.

Lost Circulation:

ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported.

Regardless of the type of drilling machinery used, if a void (bit drops) of four feet or more and circulation losses greater than 75 percent occur simultaneously while drilling in

any cave-bearing zone, drilling operations will immediately stop and the BLM will be notified by the operator. The BLM will assess the consequences of the situation and work with operator on corrective actions to resolve the problem.

Delayed Blasting:

Any blasting will be a phased and time delayed.

Abandonment Cementing:

Upon well abandonment the well bore will be cemented completely from 100 feet below the bottom of the cave bearing zone to the surface.

Record Keeping:

The Operator will track customary drilling activities, including the rate of penetration, pump pressure, weight on bit, bit drops, percent of mud returns, and presence of absence of cuttings returning to the surface. As part of customary record keeping, each detectable void or sudden increase in the rate of penetration not attributable to a change in the formation type should be documented and evaluated as it is encountered.

VII. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 2 hours in advance for a representative to witness:

- a. Spudding well
- b. Setting and/or Cementing of all casing strings
- c. BOPE tests

☒ **Eddy County**

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,
(505) 361-2822

1. **Although Hydrogen Sulfide has not been reported in this section, it is always a possible hazard. It has been reported in the township to the south measuring 8000 ppm in the gas stream from an Upper Penn well and a wildcat well reported 100 ppm in STVs.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
3. When floor controls are required, (3M or Greater) controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

B. CASING

1. The 9-5/8 inch surface casing shall be set at **approximately 1100** feet and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement).

- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
- d. If cement falls back, remedial action will be done prior to drilling out that string.

Possible lost circulation in the San Andres and Wolfcamp formations.

High potential for the occurrence of cave/karst features.

Possible high pressure gas bursts in the Wolfcamp and the Pennsylvanian section may be overpressured.

- 2. The minimum required fill of cement behind the **5-1/2** inch production casing is:

☒ Cement to surface. If cement does not circulate see B.1.a-d above.

- 3. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

- 1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
- 2. The appropriate BLM office shall be notified a minimum of 2 hours in advance for a representative to witness the tests.
 - a. The tests shall be done by an independent service company.
 - b. The results of the test shall be reported to the appropriate BLM office.
 - c. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
 - d. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.
 - e. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the **Wolfcamp** if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. . This test

does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

D. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the **Wolfcamp** formation, and shall be used until production casing is run and cemented.

E. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

Engineer on call phone (after hours): Carlsbad: (505) 706-2779

WWI 082207