# ENVIRONMENTAL ASSESSMENT
# EA# NM-066-00-121

**WELL NAME & NO.: Shelly Federal #2**
**Serial #: NM-33944**

Section 23, T. 9 S., R. 24 E., NMPM
660' FSL & 1,980' FEL

Chaves County, New Mexico

**OPERATOR: Yates Petroleum Corporation**

**ACTION:** Application for Permit to Drill

**SURFACE/MINERAL ESTATE:** Federal Surface/Minerals

## I. INTRODUCTION

A. Need for the Proposed Action:

**Yates Petroleum Corporation** proposes to drill and complete a **natural gas** well at the above described location. The proposed action is needed to fully develop the 800-acre mineral lease.

B. Background Information:

The proposed **Shelly Federal #2** gas well is located within the proposed BLM/Bitter Lake Habitat Protection Zone. This area is proposed for administrative designation for the protection of groundwater resources supplying springs and sinkholes at the Bitter Lake National Wildlife Refuge (BLNWR) that provide crucial year-long habitat for several threatened and endangered species. Specifically, spring and sinkhole habitats in the northern portion of the Refuge's Middle Tract.

In May 1997, the U.S. Fish and Wildlife Service (USFWS) provided the BLM with a biological opinion on the Roswell Resource Area Draft Resource Management Plan (DRMP). In the opinion of the USFWS, implementation of the DRMP would jeopardize the continued existence of the federal endangered Pecos gambusia (*Gambusia pecosensis*) unless the six elements of their prescribed "reasonable and prudent alternative (RPA)" are implemented. In October 1997, the record of decision (ROD) approved the plan and incorporated the RPA into the plan (Approved Roswell Resource Management Plan, ROD-1). In April 1998, the USWFS rendered a no jeopardy opinion for the Roswell Approved RMP.

The following elements of the Pecos gambusia RPA are germane to the Application for

Permit to Drill (APD) and reads:
*"Use the best available hydrologic information to map the source and movement of water that supplies springs occupied by Pecos gambusia on the BLNWR and the Salt Creek Wilderness....".*

*"For existing leases within the mapped area, apply appropriate measures taken from BLM's "Practices for Oil and Gas Drilling and Operations in Cave and Karst Areas" and any other appropriate measures to ensure no contamination of water that supplies springs occupied by Pecos gambusia on the BLNWR and the Salt Creek Wilderness. Use monitoring procedures that will detect any surface or subsurface accidents soon enough that they can be discovered and corrected before significant harm to the aquifer occurs."*

An RMP amendment is being considered to officially designate the protection zone with protective design features that would be applied to address groundwater concerns of proposed wells that fall within the proposed area. No interim plan is being prepared since direction for the authorization of the proposed well can be found in the RMP and biological opinion.

The hydrologic mapping has been completed by Balleau Groundwater, Inc. (Illustration #1), and is referenced in greater detail in the environmental assessment being prepared for the proposed Habitat Protection Zone. This is the first well to be proposed in the area of interest since the development of the habitat protection zone map which is partly based on the hydrologic study by Balleau. The proposed well is located approximately three linear miles northwest of the BLNWR Middle Tract, and penetrates strata identified as a 100 to 500-year source-water area for springs and sinkholes on the Refuge (time path could differ by a factor of two due to the uncertainty of porosity values).

The proposed well is on an existing 800-acre lease which currently has one well in production, the Shelly Federal #1 (**see Exhibit A**), located in Section 24, T. 9 S., R. 24 E. (600' FSL & 990' FWL), about one-half mile to the east of the proposed well site. Current on-lease production facilities are located on the Shelly Federal #1.

C. Conformance with Land Use Plan:

The proposed action is addressed in the Roswell Resource Area Proposed RMP/Final Environmental Impact Statement, January 1997. The proposed action is in conformance with the Roswell Approved RMP and ROD, October 1997, which supersedes all previous planning documents.

D. Relationship to Statutes, Regulations, or other Plans:

The proposed action does not conflict with any known State or local planning, ordinance or zoning.

## II. Proposed Action and Alternatives

A. Proposed Action

Yates Petroleum Corporation submitted Notices of Staking on May 26, 2000, to drill the Shelly Federal #2 gas well (see Exhibit A). The Application for Permit to Drill (APD) was submitted on June 16, 2000. The proposed action would include access road, well pad, reserve pit construction, drilling, borehole casing and cementing, and production facility apparatus installment, described in the following:

1. The proposed access road is approximately 600 feet in length beginning from Capitan Road (maintained by Chaves County) to the proposed well pad. Of the 600 feet, about 300 feet of existing road and 300 feet of new road construction would cross public lands.

The construction of the new access road would be approximately 300 feet in length. The access road would originate from an existing two-track road that forks in a northern direction from the Capitan Road. The access road would continue from the existing two-track in an easterly direction to the southwest corner of the proposed well pad and would have a 30-foot wide maximum disturbance area with a 14-foot wide driving surface. Caliche would be used as the surfacing material.

2. The construction of the proposed well pad would be 185 feet long by 325 feet wide. Standard oilfield construction equipment consisting of track-type tractors, motor graders, dump trucks, and water trucks would be used to construct the access road and well pad. Some leveling of the well pad may be required at the proposed location.

3. The construction of the proposed earthen reserve pit would be 175 feet by 150 feet and dug 4 feet below ground level. The reserve pit would be located on the north side of the well pad. The surface pit would be plastic-lined. The pit would contain mud solids and cuttings from drilling operations, and would handle artesian water flows should they be encountered.

4. Drilling Operations:

A rotary drilling rig would be used to drill the well to a proposed total depth (TD) of 5,085 feet. The drilling of a well is of a short duration. Usually the amount of time it takes to drill or complete the well is typically two weeks but may take up to four weeks. A sequential description of the proposed drilling operation follows (Illustration #2):

Casing is comprised of steel pipe of various diameters intended to prevent any transfer of fluids between the borehole and the surrounding formations. The casing would be set at different formations to protect the integrity of the well, and to seal off and protect the groundwater aquifers. Progressively smaller diameter casing would be used during the drilling process, the borehole below each string of casing is smaller than the borehole above. The steel pipe casing would be placed in the borehole as drilling progresses to prevent the wall of the borehole from caving in, to prevent seepage of fluids, and to

provide a means of extracting gas if the well is a producer. The operator has submitted a casing and cementing program as part of the APD approval. This program has been reviewed by a BLM Petroleum Engineer for adequacy or for additional, more stringent, measures that would be required on the subsurface casing and cement programs.

A 12¼-inch diameter surface hole would be drilled to a depth of 975 feet using fresh water as the drilling fluid. Surface casing 8⅝ inches in diameter would be set at this depth and cemented in place. A volume of cement sufficient to circulate to the surface would be used. A cement slurry would be raised uniformly between the casing and the borehole. Ideally, the cement would completely and uniformly surround the casing and form a strong bond to the borehole wall while preventing the contamination of groundwater aquifers. This casing string would protect fresh water from the Quaternary Alluvium and Artesia Group. The surface casing would be pressure-tested prior to drilling any deeper and witnessed by a BLM Petroleum Engineer Technician.

Next is the second string, a 7⅞-inch hole would be drilled from 975 feet using brine water as the drilling fluid to a depth of 3,370 feet. From 3,370 feet to 5,085 feet (TD), a drilling mixture of salt gel/starch/oil/lost circulation material would be used. The 4½-inch diameter production casing would be set at this depth and cemented in place if hydrocarbons are present. A volume of cement would be raised uniformly up from TD to approximately 2,800 feet, and from 1,260 feet up to the surface. Approximately 1,540 feet of 4½-inch diameter production casing annulus would not be cemented. A BLM Petroleum Engineer Technician would monitor the actual circulation of cement and verify that the cement job was properly done.

The drilling fluids, also referred to as mud, may be a mixture of bentonite, barite, gypsum, fresh water, sodium chloride (salt water), and chemical additives. The mixture of different additives to the drilling fluids provide viscosity and density to the mud. In addition, the additives in the mud support the borehole walls from caving in, the mud (clay) deposits a cake plaster on the wall of the borehole to prevent loss of drilling fluids to the formations (seals permeable zones), and the mud also exerts hydrostatic pressure that serves to protect against blowouts by holding back subsurface pressures. When mud is being circulated, bottomhole pressure is the hydrostatic pressure required to help move the mud up the annulus. Once the wellbore is drilled, the mud, along with borehole cuttings, are circulated back to the reserve pit. After drilling is completed, the contents of the pit would be allowed to dry, then covered by the previously excavated soil material and leveled.

Throughout the drilling phase, a driller's log or daily tour report would be maintained and used to report to the producer's operations staff of daily progress and occurrences during each driller's tour. It would show the hourly breakdown of time spent on various operations and records drilling rate at different depths, formation types, drilling breaks, lost circulation zones, when connections are made, when bits are changed, oil and gas shows, blowout preventer equipment (BOPE) tests, casing integrity tests, and other items. This information is used to monitor the drilling phase of the well and is made available to the BLM for review.

Working pressures of the well have also been reviewed for adequate protection from downhole pressures, which includes the blowout preventer (BOP) designed to contain wellbore pressure in the event of a "kick" (high pressure surges).

If the well is determined to be non-productive, no production casing would be set and appropriate cement plugs would be placed in the well bore to plug and abandon the well. This action would be evaluated upon receipt of a Notice of Intent to Plug and Abandon. At this time borehole data would be reviewed by a BLM Petroleum Engineer to determine the exact setting depths of the cement plugs. If the well is successful, and production casing is set, and the well will be completed for gas production.

5. Sundry Notice for Lateral Gas Pipeline: If the Shelly Federal #2 becomes a producing well, Yates Petroleum Corporation would submit a Sundry Notice to notify the BLM of additional developments such as a 4-inch diameter lateral gas pipeline to tie in to a transportation line. The potential pipeline would, in all likelihood, connect the Shelly Federal #2 to an existing transportation line on the Shelly Federal #1, which is located on the same lease about 3,000 feet to the east (See Exhibit A). The potential lateral pipeline would be placed within a 20-foot wide working corridor. Blading and trenching would be allowed in order to bury the pipeline within the corridor. The corridor would not be authorized for use as a road, except for pipeline maintenance purposes only.

B. Alternatives:

1. BLM Preferred Alternative:

Selected design features found in Practices for Oil and Gas Drilling and Operations in Cave and Karst Areas would be applied (Approved Roswell Resource Management Plan, Appendix 3, AP3-1 and the attached Exhibit C).

The access road would be constructed to minimize surface disturbance within the approved 30-foot right-of-way and would be limited to grubbing of vegetation and leveling only within the 14-foot access road width. Gravel surfacing material would be utilized instead of caliche and placed on the minimally disturbed ground surface within the proposed road route. All other existing access roads would be maintained in as good or better condition than were existing at the commencement of operations. Surfacing material (gravel) needed for the construction of the access road and well pad could be obtained by the operator from a federal pit in the NW¼SW¼ of Section 18 - T. 9 S., R. 25 E., Chaves County, NM..

The well pad would be constructed to minimize surface disturbance within the dimensions of the well pad and would be limited to grubbing of vegetation and leveling of the pad. Gravel surfacing material would be utilized instead of caliche and placed on the minimally disturbed ground surface within the proposed well pad.

The critical period for the possibility of contamination is during the drilling phase of the well. Because the well pad would be constructed within the proposed BLM/Bitter Lake

Habitat Protection Zone, in lieu of lined earthen reserve pits, steel tanks would be used (see page AP3-5). No reserve pit, or any other pits, would be constructed for the drilling activity. Above-ground steel tanks would be used for drilling muds and would be located within the perimeter of the well pad.

A volume of cement sufficient to circulate to the surface would be used from TD. A cement slurry would be raised uniformly between the 4½-inch casing and the 7⅞-inch borehole to the surface. The cement may be staged and light cement may be used in order to prevent fracturing of the formation.

If the well is a producer, a production packer would be placed on the production tubing and set above the perforations and a pressure gauge placed at the surface to monitor the status of the 4½-inch production casing during the life of the well. A production packer would seal off the production casing from the producing zone. This would allow monitoring for any internal casing leaks which would register on the pressure gauge installed at the surface.

In addition, if the well is a producer, all production facilities would be low profile, not over 10 feet in height. The height limitation of the production facilities would reduce the visual intrusion of the facilities.

2. Relocate the Proposed Action:

No other alternative location would have significantly fewer impacts than, or have a clear advantage over, the proposed location. Therefore, the alternative of changing the location involved in this action is not analyzed further in this EA.

3. No Action:

Under this alternative the application would be rejected. None of the environmental impacts associated with the proposed action or alternate location would occur. Additionally, economic benefits of the proposed action would not be realized, and the existing environment, including the developments in place, would remain unchanged.

## III. Description of the Affected Environment

A. General Setting:

The proposed access road and well pad are located on federal land about five miles northeast of Roswell, NM via Highway 70. Public lands in the general area are primarily grassland habitat and are sparsely developed with oil and gas production wells. The area is an important viewshed for the BLM as it is located in close proximity to Roswell and the BLNWR. Historical and present use of the subject lands have been limited to livestock grazing and limited energy development.

B. Rights of Record:

An inspection of the Master Title Plats and other Bureau records revealed the following title information pertaining to valid existing prior rights on the subject lands:

- Oil and gas leases NM-33944
- No federally administered rights-of-way will be affected in the project area.
- No mining claims are recorded within Section 23, T. 9 S., R. 24 E., NMPM

C. Affected Resources:

The following critical resources have been evaluated and are either not present or are not affected by the proposed action or the alternatives in this EA:

Areas of Critical Environmental Concern (ACEC's)
Cultural Resources (00-R-**033**-A)
Farmlands, Prime/Unique
Floodplains
Native American Religious Concerns
Wastes, Hazardous/Solid
Wetlands and Riparian Zones
Wild & Scenic Rivers
Wilderness

The impact of the proposed action and alternatives to minority or low-income populations or communities has been considered and no significant impact is anticipated.

1. Air Quality:

The area of the proposed actions is considered Class II air quality area. A Class II area allows a moderate amount of degradation of air quality. Primary sources of air pollution are wind-blown dust from disturbed or exposed soils and by exhaust emissions from motorized equipment.

2. Geology:

Permian age rocks are exposed at the surface in the area of interest. The rocks are predominately from the Artesia Group and the underlying San Andres Formation. The

formations found in the Artesia Group are from oldest to youngest: Grayburg, Queen, Seven Rivers, Yates and Tansill. During the Laramide Orogeny, the entire area was tilted to the east at a two to three degree dip. During relatively recent geologic time, the Pecos River flowed several miles to the west of Roswell, and it was the dip of these beds which caused the Pecos River to migrate eastward, downcutting into the sediments to form the Pecos Valley. During this process much of the Artesia Group was removed from the Pecos Slope, a geomorphic feature which stretches from the Sacramento Escarpment to the present day location of the Pecos River. The Bitter Lake National Wildlife Refuge is located in an area where the Pecos River has cut down into sediments deposited in an arm of the extensive Permian Sea.

In the vicinity of the proposed well, Kelley's geologic map (1971) shows the area to be covered by Quaternary deposits. To the northeast and east of the proposed location are the low-lying Dunnahoo Hills which are essentially a remnant outcrop of the Seven Rivers Formation. It isn't until crossing to the east side of the Pecos River that a thicker section of Seven Rivers Formation, as well as the overlying Yates Formation, is encountered. Well logs in the vicinity also show only the undifferentiated Queen/Grayburg remain of the Artesia Group in the subsurface.

Subsurface Stratigraphy

Abo Formation: Mainly dark, reddish-brown mudstone and very fine to coarse grained arkosic well sorted sandstones and conglomerate (Bartsch-Winkler 1992).
Yeso Formation: Tan, red-yellow,gray., white, shale siltstone, sandstone , limestone, dolomite, gypsum, interbedded anhydrite and minor halite. Generally, more gypsum and clastic rich in the northern portion of state and more carbonate rich in the south (Bartsch-Winkler 1992).

San Andres Formation: This formation is subdivided into the three members described below.

Rio Bonito Member: Gray, brownish gray, dolomite, limestone and sandstone (Glorieta), thick bedded (Kelley 1971).

Bonney Canyon Member: Gray, light gray, local black, thin-bedded (Kelley 1971).

Fourmile Draw Member: Dolomite, gypsum, reddish mudstone, sandstone locally at top, thin bedded (Kelley 1971). Note: According to Bachman (1987) as much as 600 feet of evaporites have been dissolved in the subsurface from the top of the San Andres along the Pecos River near Roswell (Bartsch-Winkler 1992).

Grayburg Formation: Tan to brown, medium to fine grained sandstone and thin bedded mudstone with minor cherty gray dolomite (Bartch-Winkler 1992). Thirty miles north of Roswell, Grayburg and Queen Formations undifferentiated and red mudstone and muddy gypsum predominate. Bedding thickness, carbonate content and sandstone content in lower part of formation increase southward towards the Capitan Reef (Kelley1971).

Queen Formation: Thin bedded red sandstone and mudstone with dolomite and in the vicinity of Roswell gypsum and minor thin magenta and gray dolomite predominate in upper part of formation (Bartsch-Winkler 1992).
In addition, there is an absence of thick-bedded halite in the geographic area. However, the natural processes which take place at depth in the San Andres Formation may form more sinkholes in the area as denudation continues in the area over the long term.

3. Soils:

The soils are the Hollomex loam (0 to 1 percent slope) as described in the Soil Survey of Chaves County, New Mexico - Northern Part (Page 37 and Map 27). This deep, well-drained soil type is located on low terraces. It formed in calcareous, gypsiferous alluvium and residuum. Permeability is moderate, runoff is medium and the hazard of water erosion is moderate. The hazard of soil blowing is high. Loss of the surface layer results in a severe decrease in productivity. The main limitations are the shallow depth to gypsiferous material and high hazard of soil blowing. Excavation exposes material that is highly susceptible to soil blowing. Loss of the surface layer results in a severe decrease in productivity because of the shallow depth to gypsiferous material and low precipitation. Preserving as much of the existing cover during construction and promptly revegetating disturbed areas help to control water erosion and soil blowing.

4. Vegetation:

The native vegetation in the area is composed of alkali sacaton, vine-mesquite, tobosa, cactus, broom snakeweed, and annual forbs. The mean annual precipitation is11 to12 inches. There are no known populations of noxious or invasive weed species on the proposed access road and well pad. Steps would be taken to ensure noxious weeds are not introduced to the proposed site resulting from the project.

5. Water Quality - Groundwater:

The area of analysis is at the northeast limit of the Roswell ground-water basin. The Roswell basin can be described by its three main components. The first component is an eastward dipping carbonate aquifer that is closely related to the San Andres limestone. It is often called the "artesian aquifer" though it is unconfined to the west. Water-producing zones near the Bitter Lake Refuge are at the upper part of the San Andres limestone and can extend into the Grayburg and Queen formations of the Artesia Group.

The Artesia Group comprises the second component of the basin, a leaky "confining bed" overlaying the carbonate aquifer. One or more water zones are present in the upper portion of the confining bed, contributing approximately ten percent of the water pumped in the Roswell basin (Welder 1983).

Finally, the confining bed is overlain by a water table aquifer of Quaternary alluvium, commonly called the "shallow aquifer". There is evidence that the unconfined shallow aquifer is not restricted to Pecos River alluvium, but actually extends downward to the Artesia Group (Kinney *et al.* 1968). The northern limit of the shallow aquifer falls within the area of analysis.

Recharge of the Roswell ground-water basin is primarily by infiltration from precipitation, with influent from intermittent streams and subsurface underflow as secondary sources. Recharge east of the Pecos River provides flow to the river, and sustains water levels in Bottomless Lakes State Park and areas near BLNWR. The artesian aquifer receives water from the central part of the western recharge area. The shallow aquifer is replenished from the nearest part of the western recharge area (Summers 1972). The depth of the water table ranges from less than ten feet near the river in the southeast part of the area of analysis to more than 80 feet to the west (Wilkins and Garcia 1995).

Ground water flow in much of the area of analysis converges on the Middle Tract of the refuge, which has caused concern about the risks of ground water contamination from various sources. As a result, the U.S. Fish and Wildlife Service contracted a study of the source and movement of water supplying the refuge (Balleau Groundwater, Inc. 1999). The travel time for contaminants would afford a substantial response time (100 to 500-year source zone) to mitigate potential impacts. The report provides much of the basis for delineating the area (Illustrations #1, #3, & #4).

There are no municipal wells, irrigation wells or domestic water wells in the area of influence between the Shelly Federal #2 and the BLNWR Middle Tract.

6. Wildlife:

Wildlife species utilizing this area for habitat include mule deer, pronghorn antelope, coyote, fox, rabbits, kangaroo rats, pocket gophers, prairie rattlesnakes, as well as a variety of songbirds, dove, quail, and raptors.
No known special status plant or animal species or critical habitat occur in the project area. The main habitat concern for this proposed project is the protection of the subsurface aquifers and groundwater supplying springs and sinkholes occupied by the Pecos gambusia on the BLNWR.

**Pecos gambusia** (*Gambusia pecosensis*)

The Pecos gambusia is listed as an endangered species under the Endangered Species Act of 1973. The Pecos gambusia is a small fish 25-40 millimeters long and is endemic to the Pecos River basin in the southeastern New Mexico and western Texas. Historically, Pecos gambusia occurred as far north as the Pecos River near Fort Sumner, NM, and south to Fort Stockton, TX. However, recent records indicate that its native range is restricted to sinkholes or springs and their outflows, on the west side of the Pecos River in Chaves County, NM. In spite of population declines, the species remains locally common in a few areas of suitable habitat. In NM, populations are present on the BLNWR and the Salt Creek Wilderness Area (both in Chaves County). These areas constitute the key habitat of the species in the Roswell Field Office. Populations of Pecos gambusia occur in several springs and isolated gypsum sinkholes at the BLNWR Middle Unit (Lake St. Francis Research Natural Area) and the Ink Spot sinkhole in the Salt Creek Wilderness. The drilling aspects of the well may have a remote potential negative affect upon groundwater aquifers supplying springs and isolated gypsum sinkholes at the refuge.

7. Range:

The well is located on BLM grazing Allotment 64054 operated by E.H. Cattle Company, HCR 31 Box 1318, Roswell, NM, 88201. Livestock are not actively grazing the pasture at this time. A range study site is located a few hundred yards north of the proposed well site. No range improvements are in the vicinity of the well site.

8. Visual Resource Management (VRM)/Recreation:

The proposed action is located in a designated VRM Class III area. Contrasts to the basic elements (form, line color, texture) caused by a management activity may be evident and begin to attract attention in the landscape. The changes, however, should remain subordinate in the existing landscape. Recreation in the vicinity includes seasonal hunting and sightseeing.

9. Cave/Karst:

No surface cave/karst features were observed in the immediate vicinity of the proposed action. There is the possibility of below ground level karst-type structures due to shallow occurrences of carbonates, halite and gypsum.

## IV. ENVIRONMENTAL IMPACTS

Descriptions of environmental impacts for both the Proposed Action and BLM Preferred Alternative are grouped together under each resource heading for comparative purposes.

The surface disturbance involved in the construction of the access road, well pad, and reserve pit would total about 2.0 acres of federal surface, and about 1.4 acres for a potential buried pipeline.

Environmental impacts that can be anticipated include:

1. Air Quality:

*Proposed Action and Preferred Alternative* - Air quality would temporarily be impacted with pollution from exhaust emissions, chemical odors, and dust that would be caused by the motorized equipment used to construct the access road, well pad, reserve pit, and by the rotary drilling rig. Dust dissemination would be greatly reduced upon completion of the construction phase of the access road and well pad. Air pollution from the motorized heavy equipment would discontinue entirely upon completion of the drilling phase of the operation. Winds that frequent southeastern New Mexico generally disperse odors and emissions. The impact to air quality would become greatly reduced as the construction and drilling phases are completed.

*Preferred Alternative* - Surface disturbances would be kept to an absolute minimum by clearing vegetation and blading only where it is necessary to level the access road and well pad. No reserve pit excavation would occur. Blowing dust would be minimized by

reducing the amount of soil disturbance during construction (and potential pipeline construction).

2. Geology:

The U.S. Fish and Wildlife Service has expressed concern over the creation of open holes by way of conduits through the borehole and associated casings and cited Martinez et al. (1988) as a case in point. The authors of the research state under the heading "Sinkholes Related to Petroleum Activity", "The few collapse sinks related to petroleum activity involve boreholes drilled long ago, before development of proper engineering safe guards pertaining to drilling-mud design, casing placement and the use of salt tolerant cements". In all the case studies, well were drilled 1928, and 1936 through 1938. All of the wells were underlain by 246 to 1,969 feet of salt. The type of salt found in the Permian Basin case study is halite. As there is an absence of thick-bedded halite in the geographic area of interest, the possibility for sinkhole formation due to petroleum activity is remote.

*Proposed Action and Preferred Alternative* - There would be no impact to the geology of the area.

3. Soils:

*Proposed Action and Preferred Alternative* - The construction of the access road and well pad would physically disturb about 2.0 acres of topsoil material. Where exposed, soils would be susceptible to wind blowing and water erosion. The access road may be impacted when heavy precipitation would cause water erosion damage. When water-saturated segment(s) on the access road become impassable, vehicles may still be driven over the road. Consequently, deep tire ruts would develop. Where impassable segments are created from deep rutting, unauthorized drive-arounds may occur outside the designated 14-foot wide driving surface access road. This would create additional soil impacts associated with lease development. Road construction requirements would alleviate potential impacts to the access road from water erosion damage. The impact may be fully remedied upon reclamation when the well pad and road are reseeded. The potential pipeline would disturb up to 1.4 acres of topsoil along the pipeline corridor and would mix soil horizons to a depth of 36 inches from trenching operations.

*Proposed Action* - Excavation of the reserve pit to a depth of 4 feet would disturb approximately 105,000 cubic feet of soil. Excavation would expose material that is highly susceptible to soil blowing. Loss of the surface layer would result in a severe decrease in productivity because of the shallow depth to gypsiferous material and low precipitation.

*Preferred Alternative* - The soil disturbance would be kept to an absolute minimum by clearing vegetation and blading only where it is necessary to level the access road and well pad. No reserve pit excavation would occur, and a smaller area would be required to set up steel tanks. Reducing the amount of soil disturbance during construction would minimize disturbance to the fragile soil. Surfacing the disturbed areas with gravel instead of caliche would minimize the impacts to the soil and allow the disturbed areas to

revegetate. Blading would not be required for pipeline installation, this disturbance acreage could be less than 1.4 acres.

4. Vegetation:

*Proposed Action and Preferred Alternative* - Construction activities for the access road and well pad would impact about 2.0 acres of native vegetation at the site. Vegetation that would be removed would be alkali sacaton grass that dominates the site, scattered cacti and snakeweed, phacelia and buckwheat. If drilled as a dry hole and plugged, reclamation of the site would immediately follow with vegetation re-establishing within three to five years, depending on precipitation and surfacing material. If it is a producing well, reclamation would not commence until the well is a depleted producer and plugged and abandoned. Native vegetation would encroach on the site over time with only high traffic areas remaining unvegetated.

The construction of an access road and/or well pad may unintentionally contribute to the establishment and spread of noxious weeds. The noxious weed seeds could be carried onto the project areas by construction equipment, the drilling rig and transport vehicles. The main mechanism for seed dispersion on roads and well pads is by vehicles and equipment previously used and/or driven through noxious weed-infested areas. Washing and decontaminating the equipment prior to entering federal lands would minimize this potential impact.

*Proposed Action* - All plant material within the dimensions of the pad and reserve pit would be removed. Excavation of the reserve pit to a depth of 4 feet would expose less fertile soils that would not allow for re-vegetation. The potential pipeline construction would disturb up to 1.4 acres of vegetation along the pipeline corridor from trenching operations.

*Preferred Alternative* - The construction of the access road and well pad would require minimal grubbing of vegetation and leveling of the ground prior to the progressive surfacing of the access road and well pad with gravel material. Light removal of vegetation where needed, reduced pad size, the use of steel pits versus an in-ground reserve pit, and the use of gravel as a surfacing material would reduce impacts to vegetation. Vegetation recovery on the site would depend on the life of the well. Vegetation impacts would be short-term with the site re-vegetating in a few years since a gravel surfacing material would be used instead of caliche. Because blading would not be required for pipeline installation, this disturbance acreage could be less than 1.4 acres.

5. Water Quality - Ground Water:

*Proposed Action and Preferred Alternative* - The casing and cementing procedures used in drilling a gas well are designed so that drilling fluids (mud) are contained within the casing/cemented borehole and are not allowed to discharge into underground aquifers. When completed, two strings of casing and two cement sheaths would be in place from the Glorieta formation (1,260') to the surface.

The impact from drilling fluid contamination is minimal since downhole pressures would prevent drilling fluids from entering the underground aquifers. The impacts to the aquifers would be minimized by the proper cementing of casing in the borehole from the Glorieta to the surface. Once the well is completed, the casing and cement would provide adequate protection to groundwater resources, shallower than the Glorieta, by sealing off aquifers, and preventing seepage from the borehole into the underground aquifers.

If the well is a producer, produced fluids (e.g.: saltwater, oil, and/or condensate) could cause permanent damage to soils and vegetation off the well pad in the event of a breech, overflow, or spill from storage tanks associated with production facilities on the well pad.

There would be no impact to municipal wells, irrigation wells or domestic water wells between the Shelly Federal #2 and the BLNWR Middle Tract as none are located in the area of influence.
*Proposed Action* - There is a remote possibility that accidental drilling fluid contamination of soils and groundwater (seepage) could occur during the drilling phase. Nine millimeter thick plastic sheets would be used to line the reserve pit. There is the possibility of tears in the plastic that would allow seepage to occur. After drilling operations, all drilling material would be left on-site within the reserve pit and buried. There is the long term potential for groundwater contamination from water infiltration at the reserve pit location, especially if the liner is damaged during drilling, backfill, or other future construction activities over the location.

There exists the potential for casing failure over the life of the well due to corrosion. Specifically, from 2,800 feet to the cemented Glorieta formation at about 1,260 feet, a distance of about 1,580 feet. Cement would not be raised uniformly in the annulus of the wellbore and casing (open casing) in this section. The lack of cement in this portion does not adequately provide for the long term integrity of the well bore and casing.

*Preferred Alternative* - There is a remote possibility that accidental drilling fluid contamination could occur during the drilling phase. Utilizing steel tanks to contain drilling fluids during drilling operation would prevent potential contaminants from leaching into the groundwater, and to reduce disturbance of fragile soils in the area. The tailings and muds contained in the steel tanks would be disposed at an authorized disposal site. There is the potential for drilling fluids, cuttings, and returns to exceed the capacity of the steel tanks, in which case, contamination could still occur to soils and groundwater.

The borehole casing and cementing program would protect the sub-surface aquifers from the possibility of cross-contamination between aquifers and would enhance long term well casing integrity, since the entire 4½-inch casing would be cemented from TD to the surface. Monitoring the well for casing integrity with the use of a gage installed at the surface would alert the operator and BLM of potential leaks that may impact groundwater sources.(Illustration #2)

6. Wildlife:

*Proposed Action and Preferred Alternative* - Some small wildlife species may be killed and their dens or nests destroyed during construction and operation of the well. The construction of the access road and well pad would cause some fragmentation of wildlife habitat. The facilities themselves may also be used by wildlife for shelter and nesting. Upon abandonment of the well, the area would be put back to grass lands and as close to the original topography as possible. The proper reclamation of the disturbed areas would eventually lessen the impacts to wildlife habitat. The proper restoration of the lands would bring about the return of the displaced wildlife species.

**Pecos gambusia**

Loss or alteration of habitat (periodic dewatering), and introduction of exotic fish species (mosquitofish) are the key threats to the Pecos gambusia. Potential impacts to habitat may occur from surface disturbing activities at sinkholes or springs and their outflows. There are no sinkholes or springs in the vicinity of the proposed well. Impacts to groundwater resources have been addressed under Ground Water Quality.

The probability of contamination of groundwater resources supplying springs at the BLNWR from the proposed gas well is very remote, but not discountable. The probability of an accident occurring increases as the number of producing wells are developed in the area. The proposed well is located north of Highway 70 about three miles northwest of the Refuge.

Located between the proposed well and the Refuge are other developments which pose an even greater risk for surface and subsurface contamination, such as the growing subdivision located one mile west of the BLNWR, the Atchison Topeka and Santa Fe Railroad, and Highway 70. At the present time, the BLM does not own either the surface or the mineral estate to lands located immediately adjacent to the BLNWR. These lands pose a much greater and immediate threat to the Pecos gambusia than the proposed gas well. Weighing the possibility of groundwater contamination from the proposed well and the potential for contamination from other sources (septic tanks, highway spills, railroad spills) further reduces the significance of potential contamination from the proposed well.

*Preferred Alternative* - Based on these analyses and the design features proposed under the BLM Preferred Alternative, the effects determination for the federal endangered Pecos gambusia at the BLNWR from the development of a gas well is May Affect, Not Likely to Adversely Affect.

7. Range:

*Proposed Action and Preferred Alternative* - There could be some minor disruption of livestock grazing operations in the vicinity of the well pad location during the construction and drilling phase of the well. No impacts to the range study site or range improvements would occur.

8. Visual Resource Management/Recreation:

*Proposed Action and Preferred Alternative* - The construction of the access road and well pad would modify the existing visual features of the landscape. The use of low-profile tanks and painting structures with an approved color would reduce the visual impact of the production facilities. Until reclamation of the access road and well pad are accomplished, oil and gas operations development may dominate the view of the landscape. There would be no impact to recreation uses in the area.

9. Cave/Karst:

*Proposed Action and Preferred Alternative* - There would be no impact to known cave entrances, or karst features within the project area.

B. Alternatives:

1. Relocation Alternative:

The alternative of changing the location involved in this action was not analyzed further because no other alternative location would have significantly fewer impacts than, or have a clear advantage over, the proposed location.

2. No Action Alternative

The "No Action" alternative would constitute denial of the application. This alternative would result in none of the identified environmental impacts. There would, however, be an adverse economic impact to the applicant through the denial of the lessee's right to develop the mineral reserves or through increased costs of accessing those mineral reserves through other means. There have been no significant or unmitigatable impacts identified as a result of this analysis which would warrant selection of the no action alternative.

C. Mitigation Measures:

In the unlikely event of a casing failure, one of the following actions would be pursued:

> Perforate the 4-1/2-inch casing, squeeze cement to repair the damage, and return the well to a producing status.
> Insert a string of casing (or liner) inside the 4-1/2-inch casing, cement the annular space to the surface, and return the well to a producing status.
> Plug and abandon the wellbore, rehabilitate the road and well pad.

The Roswell Field Office's Well Drilling Requirements (Exhibit B), Conditions of Approval (Exhibit C), Permanent Resource Road Requirements (Exhibit D), and the special requirements derived from this EA, would be applied to this proposed action to minimize the surface disturbance and conserve the surrounding landscape. The

protective measures described for the borehole casing and cementing process are requirements in the drilling phase that would sustain the integrity of the well and would also be sufficient for the protection of aquifers. The risk of ground water contamination, though not great, is further reduced by implementing the proposed protective measures. The BLM would monitor surface activity to detect any surface accidents soon enough that they can be discovered and corrected before significant harm to the underground aquifer can occur. The gauge placed at the surface would allow monitoring of pressures within the production casing that may indicate problems with the casing.

D. Cumulative Impacts:

In the foreseeable future, lease holders could develop more wells that could accumulate to a substantial reduction of habitat. Well development mitigation measures would greatly reduce, but may not completely eliminate accidental spills or casing failures that could contaminate the aquifers. While it is unlikely that there will be significant cumulative effects from this individual action, continued oil and gas development, and other surface-disturbing activities in this area may potentially have cumulative impacts on vegetation, soil, water, and wildlife. In the foreseeable future, the cumulative impacts from oil and gas activities would be reduced as the wells play out and the lands are reclaimed.

## V. Consultation and Coordination

An onsite inspection was conducted on the access road and well pad on June 14, 2000. In attendance were Cy Cowan, Regulatory Agent for Yates Petroleum Corporation, Richard Hill, Environmental Protection Specialist, and Dan Baggao, Lead Wildlife Management Biologist, BLM.

Coordination and consultation has occurred specifically with the U.S. Fish and Wildlife Services at a December 5, 2000 meeting and field trip hosted by the Roswell Field Office concerning the proposed well site.

An onsite inspection was conducted on August 8, 2001 with Carrie Hernandez, U.S. Fish and Wildlife Service, Ecological Services Field Office, and Dan Baggao, BLM. A field reconnaissance of the Habitat Protection Zone area was also conducted during that visit.

The issues and mitigation measures concerning the groundwater and Pecos gambusia habitat at the Refuge were discussed during the meetings and are reflected in the Drilling Requirements (casing and cement program) for this well. The comments and suggestions expressed during the onsite consultation and letters have been incorporated into this EA.

**FINDING OF NO SIGNIFICANT IMPACT**
**AND DECISION RECORD**

**EA-NM-066-00-121**

**FINDING OF NO SIGNIFICANT IMPACT:** Based on the analysis of potential environmental impacts contained in the attached environmental assessment, I have determined that impacts resulting from the proposed actions, utilizing the preferred alternatives and mitigating measures, are not expected to be significant and an environmental impact statement is not required.

**DECISION:** It is my decision to authorize the Application For Permit To Drill Or Deepen (APD), for the Shelly Federal #2 gas well, submitted by Yates Petroleum Corporation. However, the provisions for the approval of the APD will include the attachment of the Roswell Field Office requirements as defined in the following exhibits; **Exhibit A** - Location Map, **Exhibit B** - Well Drilling Requirements, **Exhibit C** - Conditions of Approval, **Exhibit D** - Permanent Resource Road Requirements, and special mitigating measures developed in the environmental assessment.

In the event the well proves to be a dry hole, or when the well is abandoned, I recommend that reclamation requirements be attached to the well abandonment, including additional requirements imperative for the complete reclamation of the disturbed areas. These actions are subject to 43 CFR 3160 regulations for Onshore Oil and Gas operations on federal lease NM-33944.

Authority for these actions is the Mineral Leasing Act of February 25, 1920, as amended.

These actions will affect public lands described as:

New Mexico Principal Meridian

Section 23; SW¼SE¼, Township 9 South, Range 24 East
660' FSL & 1980' FEL

**RATIONALE FOR DECISION:** The preferred alternatives would result in less risk of environmental degradation than the proposed action. Portions of the subject lands and adjacent lands have been used for similar purposes and all present and potential uses and users have been considered.

**COMPLIANCE AND MONITORING:** The construction phase of the proposed actions and subsequent operational phases will be monitored as per regulations.

**signed by/** **6/27/02**
**Larry D. Bray, Assistant Field Manager** **Date**
**Lands and Minerals**

# EXHIBIT B



## WELL DRILLING REQUIREMENTS

OPERATOR'S NAME: **Yates Petroleum Corporation** LEASE NO.: **NM-33944**
WELL NAME & NO: **Shelly Federal #2**
QUARTER/QUARTER & FOOTAGE: **SW¼SE¼ and 660' FSL & 1980' FEL**
LOCATION: **Section 23, T. 9 S., R. 24 E., NMPM**
COUNTY: **Chaves County, New Mexico**

### I. GENERAL PROVISIONS:

A. The operator has the right of administrative review of these requirements pursuant to 43 CFR 3165.1(a).

B. The **operator** shall hereafter be identified as the **holder** in these requirements. The Authorized Officer is the person who approves the Well Drilling Requirements.

### II. WELL PAD CONSTRUCTION REQUIREMENTS:

A. The BLM shall administer compliance and monitor construction of the access road and well pad. Notify **Richard G. Hill** at least **3** working days (72 hours) prior to commencing construction of the access road and/or well pad. Roswell Field Office number **(505) 627-0247**.

B. Prior to commencing construction of the access road, well pad, or other associated developments, the holder shall provide the dirt contractor with **a copy of the approved APD signature page, a copy of the location map (EXHIBIT A), a copy of pages 1 & 2 from the Well Drilling Requirements (EXHIBIT B), and a copy of the Permanent Resource Road Requirements (EXHIBIT D).**

C. The construction of the well pad shall be kept to minimum when grading or blading except where topography irregularities necessitates ground leveling. The well pad shall be leveled to the extent possible with minimal surface disturbance and grubbing of the vegetation shall be kept to a minimum. Surfacing of the well pad shall be done with gravel material only. In order to minimize the visual resources of the area, the holder shall not have any intrusive earthen mounds above ground level on the well pad. Upon reclamation of the well pad, the holder shall comply with the Well Drilling Requirements - VI. Seeding Requirements, mandated for the well pad. (see EXHIBIT B).

D. **Reserve Pit Requirements: NO RESERVE PITS**

1. **The holder shall use steel tanks for drilling the well in lieu of reserve pits.** Steel tanks will help prevent the possibility of the drilling fluid leaching into the underground aquifers and reduce soil disturbance.

2. The steel tanks shall be constructed so as not to leak, break, or allow discharge of drilling muds. Under no circumstances will the steel tank be opened and allowed to drain drilling muds on the ground.

3. The steel tanks shall be equipped to deter entry by birds, bats, other wildlife.

4. Drilling muds shall be properly transported and disposed at an authorized disposal site.

E. **Federal Mineral Materials Pit Requirements:**

1. Gravel from new or existing pits on Federal mineral estate shall not be taken without prior approval from the authorized officer. Contact **Jerry Dutchover** at **(505) 627 - 0236.**

2. Payment for any Federal mineral materials that will be used to surface the access road and the well pad is required prior to removal of the mineral materials.

F. **Well Pad Surfacing Requirement:**

1. The well pad shall be surfaced with **6** inches of compacted gravel. The well pad shall be surfaced prior to drilling operations (see EXHIBIT D - Permanent Resource Road Requirements, 4. Surfacing).

G. **Cave Requirements:**

1. If, during any construction activities any sinkholes or cave openings are discovered, all construction activities shall immediately cease. Contact **Larry Bray** at **(505) 627-0250**.

2. The BLM Authorized Officer will, within 24 hours of notification, conduct an on-the-ground field inspection for karst. At the field inspection the authorized field inspector will authorize or suggest mitigating measures to lessen the damage to the karst environment. A verbal order to proceed or stop the operation will be issued at that time.

## III. DRILLING OPERATION REQUIREMENTS:

A. **General Requirements:**

The Bureau of Land Management (BLM) is to be notified at the Roswell Field Office, 2909 West Second Street, Roswell, New Mexico, (505) 627-0272 for wells in Chaves and Roosevelt Counties in sufficient time for a representative to witness:

1. Spudding 2. Cementing casing: **8⅝** inch and **4½** inch 3. BOP and casing integrity tests

4. 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.

5. Submit a Sundry Notice (Form 3160-5, one original and five copies) for each casing string, describing the casing and cementing operations. Include pertinent information such as; spud date, hole size, casing ( size, weight, grade and thread type), cement (type, quantity and top), water zones and problems or hazards encountered. The Sundry shall be submitted within 15 days of completion of each casing string. The reports may be combined into the same Sundry if they fall within the same 15-day time frame.

6. The API Number, as assigned to the well by NMOCD, shall be included on the subsequent report following the setting of the first casing string.

B. **CASING:**

1. The **8⅝** inch surface casing shall be set at **975 feet and cement circulated to the surface**. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey or cement bond log shall be run to verify the top of the cement. Remedial cementing shall be completed prior to drilling out that string.

2. The minimum required fill of cement behind the **4½** inch production casing **shall be sufficient to circulate to the surface**.

C. **PRESSURE CONTROL:**

1. All BOP systems and related equipment shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2. The BOP and related equipment shall be installed and operational before drilling below the **8⅝** inch casing shoe and shall be tested as described in Onshore Order No. 2. Any equipment failing to test satisfactorily shall be repaired or replaced.

- Testing fluid must be water or an appropriate clear liquid suitable for sub-freezing temperatures. Use of drilling mud for testing is not permitted since it can mask small leaks.
- Testing must be done in a safe workman-like manner. Hard line connections shall be required.
- The requested variance to test the BOPE to the reduced pressure of 500 psi using the rig mud pumps is approved.

2. Minimum working pressure of the blowout preventer and related equipment (BOPE) shall be **2000** psi.

3. The appropriate BLM office shall be notified in sufficient time for a representative to witness the tests.

D. **MONITORING:**

In order to provide a means of monitoring the integrity of the 4½-inch casing during production operations, a production packer shall be required to be set above the perforations and a pressure gauge placed at the surface.

## IV. DOWN HOLE ABANDONMENT REQUIREMENTS:

A. If the well is a dry hole and will be plugged, approval of the proposed plugging program may be orally obtained from the BLM. However, oral approval must be confirmed in writing by immediately filing a Sundry Notice And Report On Wells (Form 3160-5), Notice of Intention to Abandon, and submitting an original and five (5) copies to the Roswell Field Office. The report should show the total depth reached, the reason for plugging, and the proposed intervals, by depths, where plugs are to be placed, type of plug, type of plugging mud, etc.

B. If the well is not drilled, please notify the BLM so that an official release can be approved.

## V. SURFACE RECLAMATION/RESTORATION REQUIREMENTS:

A. When the well is abandoned, Form 3160-5 **Notice of Intention to Abandon (NOI)** could be used by the holder as the initial report for the surface reclamation/restoration of the access road and well pad. Upon receipt of the NOI, the Authorized Officer shall provide the holder with the specific requirements for the reclamation/restoration of the access road and well pad.

B. The holder shall comply with all the surface reclamation/restoration required by the Authorized Officer pertaining to the access road and well pad. Liability under bond shall be retained until surface reclamation/restoration of the access road and well pad has been completed to the satisfaction of the Authorized Officer.

## VI. ON LEASE - WELL REQUIREMENTS:

A. The holder shall post signs identifying the location permitted herein with the requirements contained in Onshore Oil and Gas Order #1 and 43 CFR 3162.6.

B. The following data is required on the well sign that shall be posted in a conspicuous place on the well pad. The sign shall be kept up with current identification and shall be legible for as long as the well is in existence:

Operator Name: Yates Petroleum Corporation
Well Name & No.: Shelly Federal #2
Lease No.: NM-33944
Footage: 660' FSL & 1980' FEL
Location: Section 23, T. 9 S., R. 25 E., NMPM

C. **Upon abandonment of the well, the same information shall be inscribed on the dry hole marker with a beaded weld.**

D. The approval of the APD does not in any way imply or grant approval of any on-lease, off-lease, or
off-unit action(s). It is the responsibility of the holder to obtain other approval(s) such as rights-of-way from the Roswell Field Office or other agencies, including private surface landowner(s).

E. All vehicles, including caterpillar track-type tractors, motor graders, off-highway trucks and any other types of motorized equipment that is used in the construction of the access road and well pad shall be confined to the area(s) herein approved. The drilling rig shall also be confined to the approved area(s).

D. **Containment Structure Requirement: None Required**

G. **Well Completion Requirements:**

1. If the well is completed, all areas of the well pad not necessary for operations shall be reclaimed to resemble the original contours of the surrounding terrain.

2. The reclaimed portion of the well pad shall be seeded with the seed mixture prescribed by the Roswell Field Office for the Desired Plant Community on this well site.

| Common Name | Scientific Name | Pounds Pure Live Seed/Acre |
|---|---|---|
| Alkali sacaton | Sporobolus airoides | 3.5 |
| Black grama | Bouteloua eriopoda | 2.0 |
| Vine mesquite | Panicum obtusum | 2.0 |
| Tobosa | Hilaria mutica | 1.0 |
| Sand dropseed | Sporobolus cryptandus | 0.5 |
| or Mesa dropseed | S. flexuosus | |
| or Spike dropseed | S. contractus | |
| or Cane bluestem | Bothriochloa barbinoides | |
| Desert or Scarlet Globemallow | Sphaeralcea ambigua or S. coccinea | 1.0 |
| Croton | Croton | 1.0 |
| Total Pounds Pure Live Seed Per Acre | | 11.0 |

Certified Weed-Free Seed

If one species is not available, increase all others proportionately.

3. The planting of the seed shall be done in accordance with the following seeding requirements:



a. Any areas devoid of vegetation shall be plowed under with soil turning equipment and

the plowed surface shall be disced before seeding. Seed shall be planted using a drill-equipped planter with a

depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture shall be evenly and uniformly planted over the disturbed area. Smaller/heavier seeds have a tendency to drop to the bottom of the drill and are planted first, the holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed shall be broadcast and the area shall be raked to cover the seed. When broadcast seeding, the pounds per acre are to be doubled.

b. The holder shall seed all the disturbed areas with the DPC seed mixture prescribed by the BLM. The seed mixture shall be planted in the amounts specified in pounds of pure live seed per acre, (Pounds of pure live seed per acre: pounds of seed X percent purity X percent germination = pounds pure live seed). There shall be no primary or secondary noxious weeds in the seed mixture. In accordance with State law(s), the seed should be tested for purity and viability within nine (9) months prior to sell. Commercial seed shall be either certified or registered seed. The seed mixture container shall be tagged in accordance with State law(s) and the certified seed tag shall be made available for inspection by the Authorized Officer.

c. The recommended time to seed is from June 15th through September 15th. The optimum seeding
time is in mid-July. Successive seeding should be done either late in the fall (September 15th - November 15th, before freeze up) or early as possible the following spring to take advantage of available ground moisture. However, the holder may seed immediately after completing the well.

d. The seeding of the disturbed areas shall be repeated until vegetation is established on the well pad. The Authorized Officer shall make the determination when the revegetation growth on the disturbed areas are satisfactory.

e. The holder shall be responsible for the establishment of vegetation on the well pad. Evaluation of vegetation growth will not be made before the completion of the first growing season after seeding. The Authorized Officer reserves the right to require reseeding at a specific time if seed does not germinate after one growing season. Waiver of this requirement would be considered if diligent attempts to revegetate the disturbed areas have failed and the Authorized Officer determines that further attempts to replant the well pad is futile.

**4. Contact Richard G. Hill at (505) 627-0247 to witness the seeding operations, two (2) days prior to seeding the disturbed areas.**

**H. Invasive and Noxious Weeds Requirement:**

1. The holder shall be held responsible should the establishment of noxious weeds begin to grow on the access road and well location. Evaluation of growth of the noxious weeds shall be made upon discovery. The Authorized Officer reserves the right to require the holder to eradicate the noxious weed species that have invaded the access road and/or well location. Waiver of this requirement would be considered if diligent attempts to eradicate the noxious weed species has failed and the Authorized Officer determines that further attempts to eradicate the noxious weed species from the access road and well location is futile.

2. The holder shall insure that the equipment and/or vehicles that will be used to construct the access road and/or well location are not polluted with invasive and noxious weed seeds. Transporting of invasive and noxious weed seeds could occur if the equipment and/or vehicles were previously used in noxious weed infested areas. In order to prevent the spread of noxious weeds and the probability that the equipment and/or vehicles are carriers of noxious weed seeds from the conduct of previous projects in noxious weed infested areas, the Authorized Officer shall require that the equipment and vehicles be washed clean prior to construction of the access road and/or well location.

I. **Painting Requirement:**

All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" designated by the Rocky Mountain Five-State Interagency Committee. The color selected for this project is Carlsbad Canyon, Munsell Soil Color Number A 6/2.

J. **Fence Requirement: None Required**

K. **Open-vent Exhaust Stack Requirements:**

For new production equipment installed on federal leases after November 1, 1993; all open-vent exhaust stacks associated with heater-treater, separators and dehydrator units shall be modified to
prevent birds and bats from entering, and to the extent practical, to discourage perching and nesting.

## VII. SPECIAL REQUIREMENT(S):

The production facilities (storage tanks, dehydrator unit, heater/treater, separator, meter housing, stacks, expander-compressor unit, etc.) shall not be taller than ten (10) feet high for the duration of this well.

# EXHIBIT C



## CONDITIONS OF APPROVAL

OPERATOR'S NAME: **Yates Petroleum Corporation** LEASE NO.: **NM-33944**
WELL NAME & NO: **Shelly Federal #2**
QUARTER/QUARTER & FOOTAGE: **SW¼SE¼ and 660' FSL & 1980' FEL**
LOCATION: **Section 23, T. 9 S., R. 24 E., NMPM**
COUNTY: **Chaves County, New Mexico**

### I. GENERAL CONDITIONS OF APPROVAL:

A. The **operator** shall hereafter be identified as the **holder** in these requirements. The Authorized Officer is the person who approves the Conditions Of Approval.

B. The holder shall indemnify the United Sates against any liability for damage to life or property arising from occupancy or use of public lands under this authorization.

C. The holder shall have surface use approval prior to any construction work on change(s) or modification(s) to the access road and/or well pad. The holder shall submit (Form 3160-5), Sundry Notice and Report On Wells, an original plus one (1) copy to the Roswell Field Office, stating the basis for any changes to previously approved plans. Prior to any revised construction the holder shall have an approved Sundry Notice and Report On Wells or written authorization to proceed with the change in plans ratified by the Authorized Officer.

D. **Weed Control:** The holder shall be responsible for weed control on disturbed areas within the limits of the site. The holder is responsible for consultation with the Authorized Officer and/or local authorities for acceptable weed control methods, which include following EPA and BLM requirements and policy.

E. **Hazardous Substance:**

1. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act Of 1976, as amended (15 U.S.C. 2601, et. seg.) with regard to any toxic Substances that are used, generated by or stored on the project/pipeline route or on facilities authorized. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193). Additionally, any release of toxic substances (leaks, spills, etc.) in access of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act, Section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved Federal agency or State government.

2. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et. seg. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et. seg.) on this project/pipeline (unless the release or threatened release is wholly unrelated to the operator's activity on the pipeline). This agreement applies without regard to whether a release is caused by the operator, its agent, or unrelated third parties.

F. **Undesirable Event:**

If, during any phase of the construction, operation, maintenance, or termination of the authorization, any oil or other pollutants should be discharged, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutants, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages to Federal lands resulting therefrom, the Authorized Officer may take such measures as deemed necessary to control and cleanup the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve the holder of any liability or responsibility.

G. **Archeological, Paleontology, and Historical Sites:**

1. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on the holder's behalf, on public or Federal land shall be immediately reported to the Authorized Officer. The holder 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 will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder shall be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

2. The holder is hereby obligated to comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, associated funerary objects, sacred objects, and objects of cultural patrimony discovered inadvertently during the course of project implementation. In the event that any of the cultural items listed above are discovered during the course of the project work, the holder shall immediately halt the disturbance and contact the BLM within 24 hours for instructions. The holder or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes. Any unauthorized collection or disturbance of cultural resources may result in a shutdown order by the Authorized Officer.



H. **Sanitation:**

The holder shall be responsible for maintaining the site in a sanitary condition at all

times; waste materials shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.

I. **Tanks:**

Any open-top tank containing produced water, oil, or other fluids, shall be covered or equipped to prevent birds, bats, and other wildlife from entering the open-top tank.

J. **Other:** None

# EXHIBIT D



## PERMANENT RESOURCE ROAD REQUIREMENTS

OPERATOR'S NAME: **Yates Petroleum Corporation** LEASE NO.: **NM-33944**
WELL NAME & NO: **Shelly Federal #2**
QUARTER/QUARTER & FOOTAGE: **SW¼SE¼ and 660' FSL & 1980' FEL**
LOCATION: **Section 23, T. 9 S., R. 24 E., NMPM**
COUNTY: **Chaves County, New Mexico**

**The holder agrees to comply with the following:**

**1. GENERAL REQUIREMENTS:**

A. The **operator** shall hereafter be identified as the **holder** in these requirements. The Authorized Officer is the person who approves the Permanent Resource Road Requirements.

B. The holder shall minimize any disturbance to structures on public domain surface. Damages caused to any structure during road construction operations shall be promptly repaired by the holder. Functional use of any structure shall be maintained at all times. The holder shall make a documented good-faith effort to contact the owner prior to disturbing any structure.

C. When necessary to pass through an existing fence line, the fence shall be braced on both sides of the passageway prior to cutting and the fence shall be promptly repaired to at least it's former state or to a higher standard than it was previously constructed.

D. A professional engineer shall design the access road if the road grade exceeds 10 percent slope.

**2. INGRESS AND EGRESS:**

The access road shall be constructed to access the well pad on the **Southwest** corner of the well pad to comply with the planned access road route.

**3. ROAD TRAVELWAY WIDTH:**

The travelway of the road shall have a driving surface of 14 feet, with a maximum 30-foot wide disturbance area for road construction unless the Authorized Officer approves a different width.

**4. SURFACING**:

The entire length of the access road travelway shall be surfaced prior to drilling operations. **The access road travelway shall be surfaced with gravel material**. The material shall be compacted to a minimum thickness of **6** inches for the entire length of the travelway surface on the access road. The width of surfacing shall not be less

than 14 feet of travelway surface. Prior to using any mineral materials from an existing federal pit, authorization must first be obtained from the Authorized Officer.

5. **CROWNING AND DITCHING: None Required**

6. **DRAINAGE: No lead-off ditches are required for this road.**

7. **CULVERT INSTALLATION: No culverts pipes are required for this road.**

8. **TURNOUTS: None Required**

9. **CATTLEGUARDS: No cattleguards are required for this road.**

10. **MAINTENANCE:**

a. The holder shall maintain the road in a safe, usable condition.

b. The holder shall cooperate with other authorized users in maintenance of the road(s). Failure of the holder to share maintenance costs in dollars, equipment, materials, and manpower proportionate to the holders use with other authorized users may be adequate grounds to terminate the road use. The determination as to whether maintenance expenditures have been withheld by the holder and the decision to terminate the road use shall be at the discretion of the Authorized Officer. Upon request, the Authorized Officer shall be provided with copies of any maintenance agreements entered into by the holder.

11. **PUBLIC ACCESS:**

Public access on this road shall not be restricted by the holder without specific written approval being granted by the Authorized Officer.

12. **ROAD REHABILITATION REQUIREMENTS:**

a. In sections devoid of vegetation, surfacing material may be removed for use in other approved area(s), and those sections rehabilitated. If the surfacing material is left in place, areas devoid of vegetation shall be plowed under with soil turning equipment and the plowed surface shall be disced before seeding. The road shall be recontoured to as near it's original topography, as possible.

b. The reclaimed road shall be seeded with the following **DPC seed mixture** determined by the Roswell Field Office for the reclamation area(s)):

See Exhibit B Well Drilling Requirements, VI. On Lease - Well Requirements, G. Well Completion Requirements, for the Desired Plant Community Seed Mixture that shall be used on the reclaimed access road.

c. The seed and any fertilizer involved shall be broadcast over the road bed with a spreader, than harrowed to cover the seed. Use of a seed drill planter to plant is acceptable. Appropriate measures shall be taken to ensure that the seed/fertilizer mixture is evenly and uniformly applied. There shall be no primary or secondary noxious weeds in the seed mixture. In accordance with

State law(s) the seed should be tested for purity and viability within nine (9) months prior to sell. Commercial seed shall be either certified or registered and the seed mixture container shall be tagged in accordance with State law(s).

The seed mixture tag shall be made available to the Authorized Officer for inspection. The seeding shall be repeated until a satisfactory vegetation thicket is established and this determination shall be made by the Authorized Officer. Evaluation of plant growth will not be made before the first growing season.

d. Seeding shall be done between June 15th through September 15th. However, the holder can seed the road immediately after preparing the road bed.

e. The Authorized Officer reserves the right to require reseeding at a specific time if seed does not germinate after one (1) growing season. Waiver of this requirement would be considered if diligent attempts to revegetate the road has repeatedly failed and the Authorized Officer determines that further attempts to revegetate the road would be futile.

f. **Contact Richard G. Hill at (505) 627-0247 to witness the seeding operations two (2) days before the start of the seeding process.**

**13. SPECIAL REQUIREMENTS:** NONE