

**STATE OF NEW MEXICO
DEPARTMENT OF ENERGY, MINERALS AND NATURAL RESOURCES
OIL CONSERVATION DIVISION**

**APPLICATION OF DEVON ENERGY PRODUCTION
COMPANY LP FOR A STANDARD HORIZONTAL SPACING
AND PRORATION UNIT AND COMPULSORY POOLING,
EDDY COUNTY, NEW MEXICO**

Case No. 20160

**APPLICATION OF DEVON ENERGY PRODUCTION
COMPANY LP FOR A STANDARD HORIZONTAL SPACING
AND PRORATION UNIT AND COMPULSORY POOLING,
EDDY COUNTY, NEW MEXICO**

Case No. 20161

AMENDED AFFIDAVIT OF SUSAN ESTES

Susan Estes, of lawful age and being first duly sworn, declares as follows:

1. My name is Susan Estes. I work for Devon Energy Production Company L.P. (“Devon”) as a geologist.
2. I have previously testified before the New Mexico Oil Conservation Division as an expert witness in petroleum geology. My credentials as a petroleum geologist have been accepted by the Division and made a matter of record.
3. I am familiar with the applications filed by Devon Energy Production Company, L.P. in this case and I have conducted a geologic study of the Bone Spring Formation underlying the subject acreage.
 - a. In Case No. 20160, Devon seeks to dedicate a standard 320-acre, more or less, horizontal spacing unit comprised of the N/2 N/2 of Section 13 and the N/2 N/2 of Section 14, Township 21, South, Range 27 East, NMPM, Eddy County, New Mexico to its Lone Tree Draw 14-13 State Com 621H well.

- b. In Case No. 20161, Devon seeks to dedicate a standard 640-acre, more or less, horizontal spacing unit comprised of the S/2 of Section 13 and the S/2 of Section 14, Township 21, South, Range 27 East, NMPM, Eddy County, New Mexico to its Lone Tree Draw 14-13 State Com 623H well.
- c. In both cases, Devon is targeting the Upper Wolfcamp Formation, which is an oil formation (gas oil ratios (GORs) in the area generally run in the volatile oil range of ~ 1,750-3,200 cfg/bbl). The wells will be located in the Alacran Hills Upper Wolfcamp Oil Pool; Pool Code 98314.

5. **Exhibits A-1 and A-2** are subsea structure maps that I prepared for the top of the Wolfcamp Y Sand. The proposed Standard Horizontal Spacing Unit for the wells is depicted by the blue outline or box. The contour interval is 50 feet and the proposed wellbore paths for the wells are depicted by red lines, with the BHL being indicated by red circles. The structure map shows that overall, the area is dipping to the east and into the basin but includes a localized structural component on roughly the western half of the map. From west to east, the contours show the Wolfcamp Y Sand dipping down into the basin which then transition back up to a localized structural high (deep seated, 4-way closure) that trends SW/NE. The contours then continue down-dip off the eastern flank of the localized structural high and into the basin. I do not observe any faulting, pinch-outs, or other geologic impediments or hazards to developing this targeted interval with a horizontal well.

6. **Exhibits B-1 and B-2** are gross isopach maps that I prepared for the Wolfcamp Y Sand. As in the previous map, the proposed Standard Horizontal Spacing Unit for the wells are depicted by blue outlines or boxes, the proposed wellbore paths are denoted by red lines and the BHLs are indicated by red circles. The contour interval is 10 feet and thickness of the Wolfcamp

Y Sand interval over the Lone Tree Draw development block ranges from approximately 50-80 feet. Also shown on the maps are two (2) lines of section for cross-sections that I prepared to illustrate the consistent and contiguous nature of the Wolfcamp Y Sand. The red line (A-A') is a strike section of type wells that penetrate the Wolfcamp within and offsetting the Lone Tree Draw development block; the blue line (B-B') is a dip section of type logs that penetrate the Wolfcamp within and offsetting the Lone Tree Draw development block.

7. **Exhibits B-1A and B-2A** are locator maps with lines of section for the Lone Tree Draw 14-13 State Com 621H and Lone Tree Draw 14-13 State Com 623H wells. As in previous maps, the proposed Standard Horizontal Spacing Unit for each well is depicted by blue outlines or boxes, the proposed wellbore paths are denoted by red lines and the BHLs are indicated by red circles. Also shown on the maps are two (2) lines of section for cross-sections that I prepared to illustrate the consistent and contiguous nature of the Wolfcamp Y Sand. The red line (A-A') is a strike section of type wells that penetrate the Wolfcamp within and offsetting the Lone Tree Draw development block; the blue line (B-B') is a dip section of type logs that penetrate the Wolfcamp within and offsetting the Lone Tree Draw development block.

8. **Exhibits C-1 and C-2** are south to north strike sections (A-A') illustrating the type wells (wells that are representative of the area) within and offsetting the Lone Tree Draw development block that penetrate the Wolfcamp Formation; the line of section is shown on the inset map. Each well in the cross-section contains gamma ray, resistivity, and porosity logs. The proposed Wolfcamp Y Sand target interval is labeled and depicted by the yellow shading. The cross-section demonstrates that the targeted interval extends across the proposed spacing and proration unit (i.e. is laterally contiguous) and is consistent in thickness and log character.

9. **Exhibits D-1 and D-2** are west to east dip sections (B-B') illustrating the type wells

(wells that are representative of the area) within and offsetting the Lone Tree Draw development block that penetrate the Wolfcamp Formation; the line of section is shown on the inset map. Each well in the cross-section contains gamma ray, resistivity, and porosity logs. The proposed Wolfcamp Y Sand target interval is labeled and depicted by the yellow shading. The cross-section demonstrates that the targeted interval extends across the proposed spacing and proration unit (i.e. is laterally contiguous) and is consistent in thickness and log character.

10. Exhibits E-1 and E-2 are gun-barrel diagrams (similar to a cross-section) illustrating how Devon is being proactive in order to mitigate potential communication issues between the 3rd Bone Spring and the Upper Wolfcamp Formations. Since public data suggests that there is apparent communication between the two formations, Devon is doing everything possible to mitigate that risk and be a prudent operator. Since it is unknown how much these two formations communicate with each other, Devon is approaching the Lone Tree Draw development block as a pilot or appraisal program so that we can obtain data to inform future decisions in our remaining acreage position. This data will allow us to optimize spacing patterns (wells per section) and production, as well as prevent both waste and over-capitalization. If the data collected supports drilling the Upper Wolfcamp sands, Devon will be co-developing the 3rd Bone Spring and the Wolfcamp Y due to these potential communication issues. Further clarification may be found in the Affidavit of Karsan Sprague, Devon's reservoir engineer.

On the right side of the gun-barrel diagram is a wireline log showing the formation tops, log character and petrophysical attributes of the Lower 3rd Bone Spring Sand and the Upper Wolfcamp sands. On the left side of the diagram, the red and blue dots illustrate the approximate, planned vertical and horizontal spacing between the 3rd Bone Spring and Upper Wolfcamp laterals, running south to north in the 1-mile Lone Tree Draw development block and as also shown in the

small inset map to the right. The red dots represent the 3rd Bone Spring wells and the blue dots represent the Upper Wolfcamp wells. In a full development scenario, Devon is planning to stagger the laterals up to ~ 280 feet vertically between the 3rd Bone Spring and Wolfcamp Y targets and between ~ 660-880 feet horizontally between targets so as to put as much distance as possible between the two formations to avoid potential interference issues. On a planar (same target formation) basis, the laterals will be spaced ~ 1,540-1,640 feet apart across the development block from south to north. Additionally, Devon is planning to install down-hole gauges to monitor pressures between the two formations, as well as obtain DFIT and PVT data. This data will inform our reservoir and frac modeling, as well as our petrophysical models, which ultimately impacts future decisions in our core acreage position. Since Devon is planning to obtain data up-front on the Lone Tree development block, we are only planning on two (2) Wolfcamp wells in the block (versus three (3) wells in a full-development scenario) due to the timing of the data acquisition and subsequent evaluation.

11. In my opinion the west to east orientation of the proposed wells in the Bone Spring formation is appropriate in order to effectively drain the targeted reservoirs and is effectively perpendicular to the maximum stress regime observed in the area.

12. Based on my geologic study of the area, the Upper Wolfcamp Formation underlying the subject area is suitable for development by horizontal wells and the acreage comprising the proposed spacing and proration units will contribute more-or-less equally to the production from the wellbores.

13. The Exhibits to this Affidavit were prepared by me, or compiled from Devon's company business records.

14. The granting of this Application is in the interests of conservation, the prevention

