

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

**APPLICATION OF LOGOS OPERATING, LLC FOR COMPULSORY POOLING,
SAN JUAN COUNTY, NEW MEXICO**

Case No. 20491

AFFIDAVIT OF TREVOR GATES

I, being duly sworn on oath, state the following:

1. I am over the age of 18, and I have personal knowledge of the matters stated herein.
2. I am employed as a petroleum geologist for LOGOS Resources II, LLC (“LOGOS”), and I am familiar with the subject application and the geology involved.
3. This affidavit is submitted in connection with the filing by LOGOS of the above-referenced compulsory pooling application pursuant to 19.15.4.12.A(1) NMAC.
4. I have previously testified before the New Mexico Oil Conservation Division as an expert witness in petroleum geology matters. My credentials as a petroleum geologist have been accepted by the Division and made a matter of record.
 - a. I hold a Bachelor’s degree in Geology from the University of Colorado, Boulder.
I completed my education in 2006.
 - b. I have been employed as a petroleum geologist since 2006. I have worked in New Mexico since 2015.
5. **Exhibit 8** is a structure map of the Basal Niobrara pick, which lies directly above the regressive Gallup sands. The proposed area of compulsory pooling is depicted by a red rectangle. The structure is labeled in sub-sea vertical depth. The contour intervals are 25 ft each.

There is a gentle dip down to the northeast. To date there are no other horizontal wells in the section that have targeted the Gallup sands. The vertical wells controlling the structure map have the sub-sea vertical depth posted. The subsequent cross-section from A-A' is also identified to locate our closest control on the reservoir properties for the Dragonfly 2408 13C Com wells. I do not observe any faulting, pinch-outs, or other geologic impediments or hazards to developing this targeted interval with a horizontal well.

6. **Exhibit 9** is a stratigraphic cross-section of the Gallup Interval. Each well is a triple combo log. Track 1 is gamma ray log scaled from 0 to 200 api units. Lower gamma readings indicate more sand while higher gamma readings indicate more shale. Track 2 shows the deep resistivity log from 0 ohmm to 50 ohmm. Track 3 is the porosity track with neutron porosity identified by the red curve scaled from 30% to -10%. The density porosity curve is the blue curve from 30% to -10%. The cross-section identifies tops used to evaluate reservoirs and landing targets for the Dragonfly 2408 13C Com No. 1H and 2H wells. Using the Shoo Fly #1 well as a depth reference, the Mancos Lower top is 5581' MD, Basal Niobrara top is 5733' MD and the Base Gallup top is 5836' MD. Perfs in the vertical wells are shown by the pink boxes in the depth track and indicate historic targets. The reservoir in this area has constant thickness and reservoir facies.

7. **Exhibit 10** is a Gross Isopach map from the Basal Niobrara to the Base Gallup picks. The contour intervals are 5 ft each. This map shows the location of the Dragonfly 2408 13C Com spacing unit outlined by the red box and the surface/bottom hole locations of the Dragonfly 2408 13C 1H and 2H wells. The anticipated gross thickness of the interval is 95 ft. through the entire Horizontal Spacing Unit. The location of the previous cross-section from A-A' is also shown on this map.

8. Based on my geologic study of the area, I conclude the following:


- a. The horizontal spacing unit is justified from a geologic standpoint.
- b. There are no structural impediments or faulting that will interfere with horizontal development.
- c. Each quarter-quarter section in the unit will contribute more or less equally to production. Each well is reasonably expected to be classified as an oil well with producing characteristics similar to other Gallup oil wells in the area.
- d. The preferred well orientation for the proposed unit in this area is east-west. This is because the inferred orientation of the maximum horizontal stress is roughly northwest-southeast.
- e. The reserves underlying the proposed unit can be efficiently and economically developed by the three wells.

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

10. The granting of this Application is in the interests of conservation and the prevention of waste.

11. The foregoing is correct and complete to the best of my knowledge and belief.

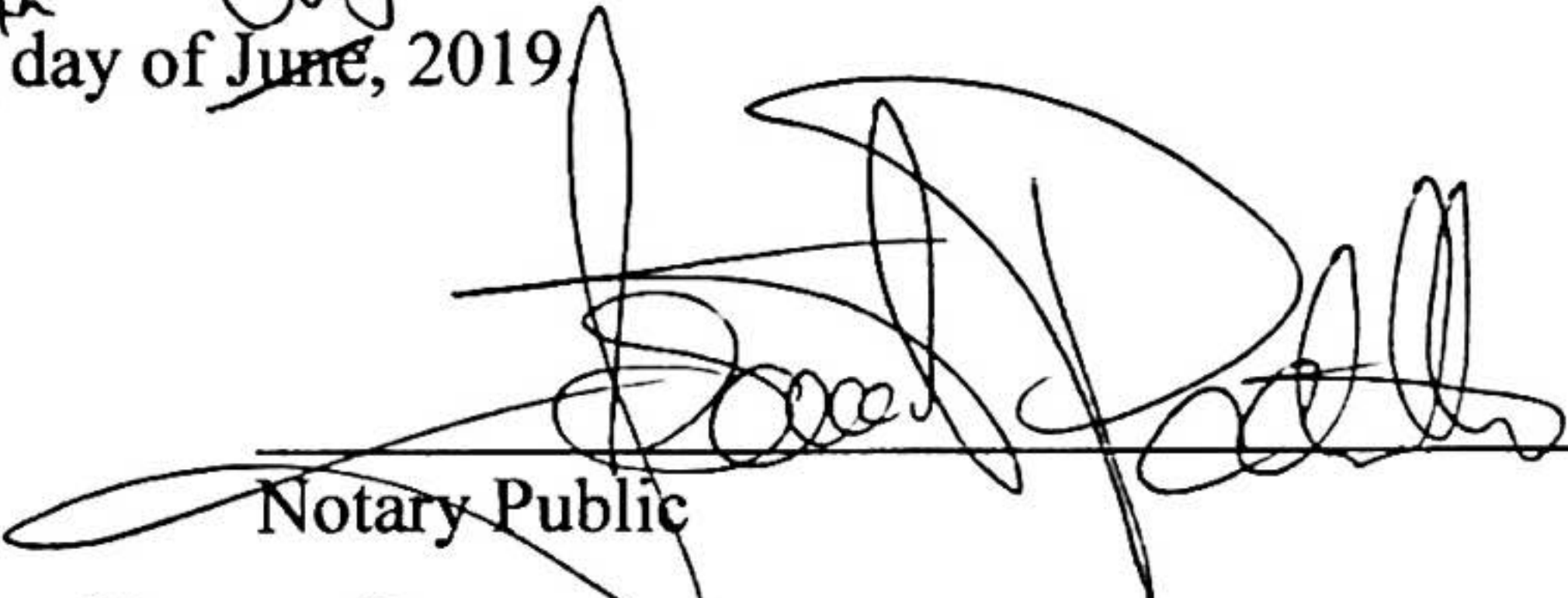
FURTHER AFFIANT SAYETH NAUGHT



TREVOR GATES

STATE OF NEW MEXICO)
)ss
COUNTY OF SAN JUAN)

Subscribed to and sworn before me this 28th day of ^{July}~~June~~, 2019 ^{JP}



Notary Public

My Commission expires 03-01-2023.



OFFICIAL SEAL
Isaiah Padilla
NOTARY PUBLIC - STATE OF NEW MEXICO
My Commission Expires: 03-01-2023