STATE OF NEVADA
COMMISSION ON MINERAL RESOURCES
DIVISION OF MINERALS
400 W. King Street, Suite 106
Carson City, Nevada 89703
(775) 684-7040 • Fax (775) 684-7052
http://minerals.nv.gov/

BRIAN SANDOVAL
Governor

Las Vegas Office: 2030 E. Flamingo Rd. #220, Las Vegas, NV 89119
Phone: (702) 486-4343; Fax: (702) 486-4345

RICHARD PERRY
Administrator

April 10, 2017

FACTS ON THE USE OF HYDRUALIC FRACTURING IN NEVADA:

Oil has been produced in Nevada since 1954. Oil exploration has occurred where there are geologic targets, in the central and eastern part of the State. Currently oil is produced in Pine Valley in Eureka County and Railroad Valley in Nye County. One refinery operates in Nye County and employs 26 people processing all of the oil produced in the state into diesel and asphalt products that are used in Nevada.

Five wells have been hydraulically fractured in Nevada: three in Elko County, and one each in Nye and Eureka Counties. One of these wells currently produces oil, and two others initially produced oil but are currently shut in. NDOM field inspectors were on-site for all of the hydraulic fracturing treatments, and there were no accidents, spills or environmental incidents.

Nevada has never had commercial natural gas production.

Nevada developed comprehensive regulations for hydraulic fracturing in 2014. These regulations were jointly developed by the NDEP and NDOM through public meetings and individual stakeholder meetings. These regulations were ultimately recommended by the Mining Oversight and Accountability Commission, approved by the Commission on Mineral Resources, and adopted by the Interim Legislative Commission in 2014. The regulations addressed concerns heard at public workshops regarding the risk of groundwater contamination.

Specifically, the Nevada regulations:

1. require an application process which examines subsurface geology
2. require pre- and post- HF water samples of any existing water wells within one mile
3. require the use of intermediate casing in the zone of groundwater
4. require proof of cement bonding on casing using down-hole geophysical surveys
5. require pressure testing of the casing before the well can be completed
6. require notification to nearby land owners and the County Commissioners prior to an HF treatment
7. require disclosure and pre-approval of chemicals proposed to be used in a hydraulic fracturing treatment. Three chemicals proposed in 2014 were not allowed, and acceptable substitutes were sourced by the owner of the wells.
8. require off-site disposal of any hydraulic fracturing fluids collected at a drill site at a certified facility. No discharge of spent hydraulic fracturing fluids is permitted.
9. require disclosure of chemicals and water volumes used on the publically-accessible FracFocus chemical disclosure registry web site (www.fracfocus.org)

These regulations are protective of groundwater and the environment. EPA studies list spills and discharges of hydraulic fracturing fluids as posing the highest risk for groundwater contamination, and each of these are addressed in Nevada's regulations.

Pre- and post- hydraulic fracturing samples of existing wells within a mile of a well that was hydraulically fractured have not indicated any groundwater contamination.

All oil and gas permits in Nevada are available on the Division of Minerals web site at: http://minerals.nv.gov/Programs/OG/OGPermits/

Water Use in Hydraulic Fracturing

Water use for the five hydraulic fracturing treatments in Nevada averaged 226,812 gallons or 0.69 acre-feet per well. A waiver for water to drill an oil well is required by the Nevada Division of Water Resources. If Nevada experienced a boom in oil drilling, defined as enough wells to maintain a 50,000 barrel per day production rate, it would require the drilling of 100 to 120 wells per year. If these wells had a horizontal or lateral component, water use may increase to 5 acre-feet per well, a use rate typical of hydraulically fractured wells in other states. This would require 500 to 600 acre feet of water per year, about the same amount as one irrigation pivot uses to grow a crop of alfalfa in Nevada each year.

Earthquakes or "Induced Seismicity"

Induced seismicity has been documented to have occurred in some areas of the U.S. where produced water is re-injected. Produced water is recovered from hydrocarbon well operation where it is separated at the surface from hydrocarbons and re-injected by wells into the production strata or an exempted aquifer. NDOM monitors earthquake activity in Nevada daily through the use of the USGS web site plotted onto Google Earth maps: https://earthquake.usgs.gov/learn/kml.php . Produced water has been re-injected back into the producing formation in Railroad and Pine Valleys, the site of the two oil-producing fields in the State. This is permitted and monitored under UIC (underground injection control) permits issued by the Division of Environmental Protection. In 63 years of oil production in Nevada, this re-injection of water has not resulted in any induced seismicity. Re-injection of spent geothermal brines is regulated under the same UIC program and the Division monitors for induced seismicity near geothermal fields using the same daily monitoring scheme.

Hydraulic Fracturing on Federal Oil and Gas Leases

There is a significant probability that Federal land managers will not be bound by a state-law ban on hydraulic fracturing for operations on Federal lands. This is based on an informal opinion requested from the BLM, given by their solicitor. 99.8% of oil producing in Nevada in 2016 was from Federal lands. If a State prohibition on hydraulic fracturing on Federal lands was determined by the courts to be unenforceable, then State regulations would also not be enforceable. Nevada regulations for hydraulic fracturing are comprehensive and far more stringent than Federal regulations, as the BLM has yet to approve comprehensive regulations for hydraulic fracturing. This is why it was so important to get the State regulations completed in 2014, as an operator must adhere to the more stringent of the regulations in a dual-permitting state.