



COLORADO
Oil & Gas Conservation
Commission
Department of Natural Resources

1120 Lincoln Street, Suite 801
Denver, CO 80203

MEMORANDUM

August 15, 2015

TO: Robert P. (Bob) Koehler, PhD.
Oil and Gas Conservation Commission

FROM: Chris Eisinger
Colorado Oil & Gas Conservation Commission

SUBJECT: Seismic Evaluation, NGL #C12, API # 123-41201

The location for the proposed injection well was reviewed using public maps and data; no site-specific subsurface data was evaluated.

I have reviewed the location for this proposed injection well using public maps and data. I have not reviewed any site-specific subsurface data. Proposed formations of injection include Permian and Pennsylvanian intervals from the Lyons Formation through the Fountain and Morrow Formations. Evaluating the regional stratigraphy suggests the bottom hole for this well (at a TD of 9,836') would be approximately 100 to 500 feet above the top of the Precambrian basement at this site. There is limited data, however, to constrain the precise depth of the basement at this location.

The USGS National Earthquake Hazard Map shows areas susceptible to ground shaking during fifty year intervals. This part of Colorado is an area that has been designated as being susceptible to a lower PGA (~0.07 g) compared with other parts of Colorado.

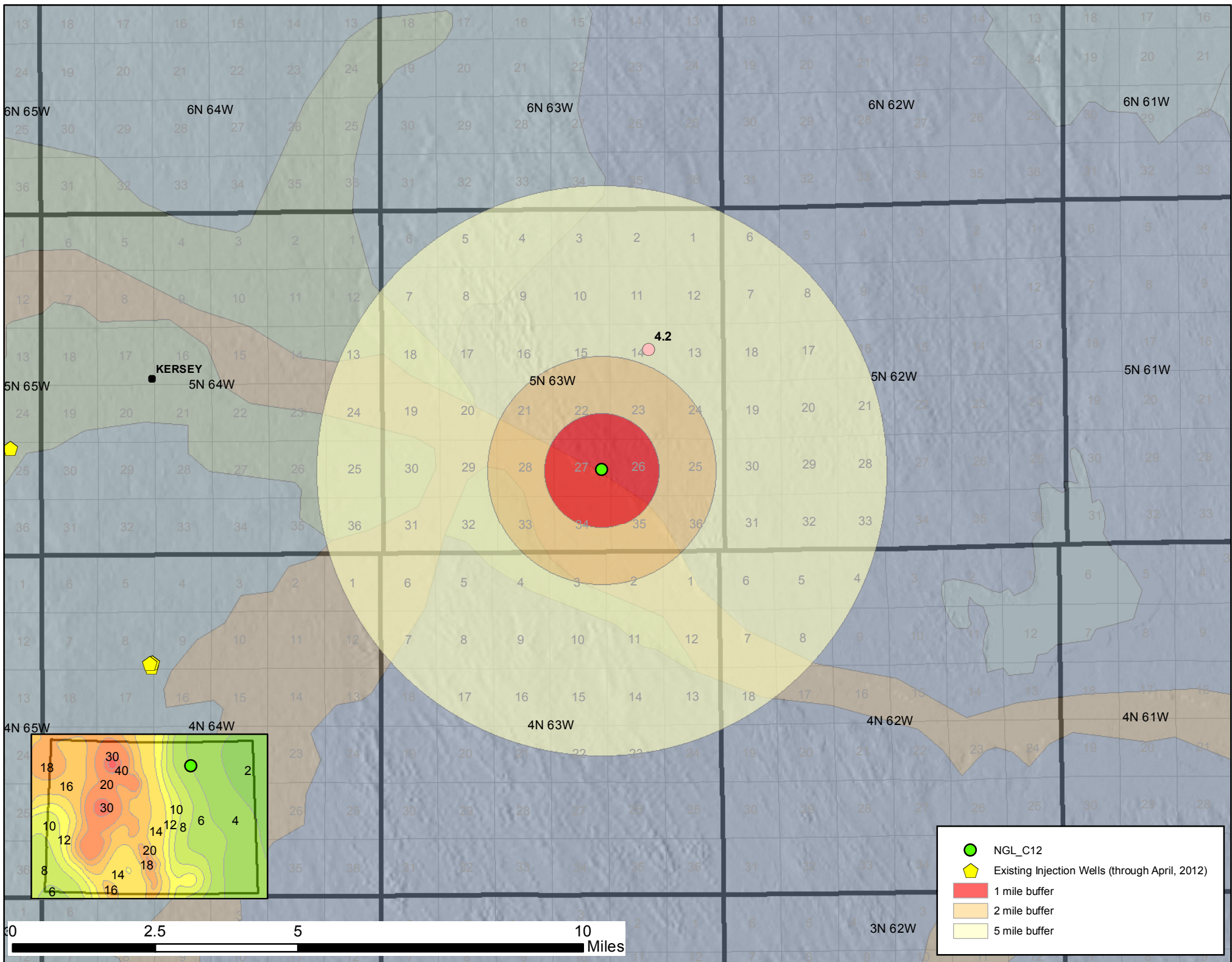
There are no existing injection wells within 5 miles south of the proposed site.

A M4.2 earthquake was recorded in 1969 less than 3 miles northeast of the site by the USGS. Recent investigation, however, suggests this event was likely mislocated. No mapped faults occur within ten miles of the proposed well according to published geologic maps.

The proposed high volume (10,000 – 23,040 bbls/day) of water disposal into formations within 500 feet of the geologic basement should be approached cautiously. If permitted, the operator should increase the injection rate via steps with careful observations being made with a local seismometer. If a rate step is reached that has induced seismic events occurring with greater frequency and magnitude, it is recommended a cap on the permitted injection volume be placed.

If any seismic activity is detected subsequent to the initiation of injection, a local seismometer would help determine whether activity is related to the injection, and allow for possible management of injection volumes and rates.





MEMORANDUM

February 24, 2015,
Updated August 24, 2015

TO: Chris Eisinger, Oil and Gas Conservation Commission (OGCC)

FROM: Robert P. (Bob) Koehler, Phd., OGCC

SUBJECT: Need for Seismic Evaluation

The OGCC has received an application for a water injection project, summarized as follows:

LOCATION	COUNTY	FIELD
NESE Section 27 Township 5 North Range 63 West, 6th P.M.	Weld	Wattenberg #90750

WELL NAME	NGL: NGL C12 (API: 123-41201)	
INJECTION ZONE FORMATION	DJINJ = Lyons, L. Satanka, Wolfcamp, Amazon, Council Grove, Admire, Virgil, Fountain, Missouri, Des Moines, Atoka, Morrow, and Mississippian Formations	
DEPTH OF INJECTION INTERVAL	Open Hole: 8,721-9,836	feet
PROPOSED INJECTION PRESSURE	2,200 to 2,724	psig
FRAC GRADIENT OR PRESSURE (BHP)	0.63	psi/ft
VOLUME OF FLUID TO BE INJECTED	10,000 to 23,040	bbl/day
TDS OF INJECTION ZONE FLUID	43,500 to 168,000	mg/L
TDS OF FLUID TO BE INJECTED	TBD (Commercial Disposal)	mg/L

WELL CONSTRUCTION DATA (Pre-Drill Estimates)					
CASING STRING	HOLE SIZE	CASING SIZE	DEPTH	AMOUNT CEMENT	CEMENT TOP
Surface	12-1/4"	9-5/8"	911	235 sks	0'
1st String*	8-3/4"	7"	8,294'	815 sks	0'
1st Liner**	6-1/8"	4-1/2"	9,843'	NA	NA

*DV Stage Tool @ 6,811' with 160 sks cement below and 655 sks above.

**Casing Packer @ 8,150'; External Casing Packers @ 9,007', 9,185', & 9,570'. ARES Packers at 8,550', 8,586' sealing off High Pressure Gas Zone @ 8654'.

Please evaluate and express any concerns you have regarding seismic activity and faulting in the area that may be affected by this underground injection control project. Thank you.

