

March 31, 2020

Robert P. Koehler, PhD
Oil & Gas Conservation Commission
bob.koehler@state.co.us

Subject: Water Injection Project - Pintail SWD 0780 #2-16D (API: 05-057-06566)
SE SW Section 16, Township 7 North, Range 80 West, 6th PM
Sandridge Exploration & Production, LLC

On March 27, 2020 you sent a memo describing a proposal by Sandridge Exploration & Production LLC for the conversion of a newly constructed directional well, Pintail SWD 0780 #2-16D, for injection into the Dakota and Lakota Formations. Originally, the Pintail SWD 0780 #2-16D well was to inject into the Entrada Formation. However, during drilling, the first string casing could not be cemented appropriately and the well was instead recompleted as a Dakota and Lakota injection well. The Sandridge Pintail SWD 0780 #2-16D well is located in the SE¼ of the SW¼ of Section 16, Township 7 North, Range 80 West of the Sixth Principal Meridian in Jackson County. The well is approximately 3 miles east-northeast of Coalmont, CO and 12 miles south-southwest of Walden, CO. The uppermost injection formation, the Dakota, outcrops approximately 7.5 miles southeast of the proposed well location.

The well completion information indicates that the Pintail SWD 0780 #2-16D well was constructed with 16-inch conductor casing set to a depth of 51 feet and cemented back up to ground surface. 9-5/8-inch surface casing was then placed to a depth of 2,318 feet and was cemented back up to the surface. 5-1/2-inch casing extends to a total depth of 9,930 feet and was cemented back up to 2,230 feet, with perforations from 9,690-9,728 feet, 9,734-9,746 feet, and 9,755-9,804 feet through the Dakota and Lakota Formations.

There are no completed water supply wells of record within ¼ mile of the wellhead, as shown in Table 1. There are no water rights structures within ¼ mile of the proposed wellhead as shown in Table 2. There are eight COGCC oil/gas wells within ¼ mile of the proposed wellhead as shown in Table 3. A PDF output from MapViewer delineating a ¼ mile radius from the proposed injection well is attached. Permitted water supply wells are shown with green circles, decreed water rights structures are shown with magenta squares, and OGCC wells are shown as pink squares. There are 30 dams within 10 miles of this injection well. The dams and hazard ratings are shown on an attached map.

The geology of this area consists of the Tertiary age Coalmont Formation unconformably overlying Cretaceous sedimentary rocks including the Pierre Shale, Niobrara Fm, Benton Shale, Dakota Sandstone and Morrison Fm. The closest wells likely produce water from either the shallow alluvium or the Coalmont Formation. There is fairly extensive normal faulting to the south and west of the injection site. These faults offset the Cretaceous formations at depth but do not appear to put shallow groundwater resources in jeopardy of contamination from the Dakota and Lakota Formations.



Bob Koehler
March 31, 2020
Page 2 of 2

Due to the great depth of the injection zone formation it is not considered to be a source of potable groundwater at this location. Based on the information provided, injection into the Dakota and Lakota Formations through a properly constructed well should not negatively impact existing groundwater or surface water resources in the vicinity. If you have any questions or require additional information, please feel free to contact me (303-866-3581 x8218).

1120 Lincoln Street, Suite 801
Denver, CO 80203

March 26, 2020

MEMORANDUM

TO: Andrew Flor
Division of Water Resources

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

SUBJECT: Need for Hydrologic Information

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

Originally in the Pintail SWD 0780 2-16D the Entrada Formation was the intended injection disposal zone. However, when drilling this directional well the 1st String Casing while reaching the desired setting depth could not be cemented from the bottom up. Details can be found in the Comment below the Casing Table and in the enclosed wellbore diagram. The well was recompleted as a Dakota and Lakota injector. Given the low TDS values an Aquifer Exemption from the EPA and Colorado Water Quality Control Division of CDPHE for the Dakota and Lakota will be required. Application for an Exemption has been filed with these agencies.

Note that last year we approved injection in the Entrada in two nearby wells, the Bighorn 0780 1-17 (API: 057-06585) and Pintail SWD 0780 1-16D (API: 057-06562). These wells required an Aquifer Exemption for the Entrada, a map showing the relationships is enclosed.

LOCATION	COUNTY	FIELD
Surface SESW Section 16, Township 7 North, Range 80 West, 6th P.M.	Jackson	North Park Horizontal Niobrara # 60120

WELL NAME	Pintail SWD 0780 2-16D (API: 057-06566)	
INJECTION ZONE FORMATION	Dakota and Lakota Formations	
DEPTH OF INJECTION INTERVAL	9,690 to 9,804 ft (MD), 8,975 to 9,078 ft (TVD)	feet
PROPOSED INJECTION PRESSURE	1,500 to 1,750	psig
FRAC GRADIENT OR PRESSURE (BHP)	-0.69 (Step Rate Test)	psi/ft
VOLUME OF FLUID TO BE INJECTED	100 to 8,500	bbl/day
TDS OF INJECTION ZONE FLUID	3,175	mg/L



TDS OF FLUID TO BE INJECTED	9,000	mg/L
-----------------------------	-------	------

WELL CONSTRUCTION DATA: Pintail SWD 0780 2-16D								
CASING STRING	HOLE SIZE	CASING SIZE	CSG WT	CSG TOP	SET DEPTH	CEMENT VOLUME	CEMENT TOP	CEMENT BOTTOM
Conductor	26"	16"	75#	0'	51'	60 sacks	0'	51'
Surface	12.25"	9.625"	36#	0'	2,318'	585 sacks	0'	2,318'
1st String	8.75"	7"	26#	0'	10,788'	965 sacks	2,230'	9,930'
Open Hole	8.75"			9,930'	10,788'			
1st String set at 10,788 ft but attempts failed to circulate cement through float shoe at 10,698 ft and perforations at 10,642 ft and 10,430 ft. Cement circulation successful through perforations at 9,930 ft. Well plugged back by CIBP at 9,875 ft with 10 sacks of cement on top of it, PBDT is 9,870 ft.								

Please furnish the OGCC with the name and depth of any aquifer in the area of injection that is a known or potential fresh water stratum. We would also like a list of the water wells within one half mile of this location. Any other information with regard to distance to streams, ditches or outcrops would be very helpful.

Thank you for your attention. Please contact me with any questions.

Sincerely,



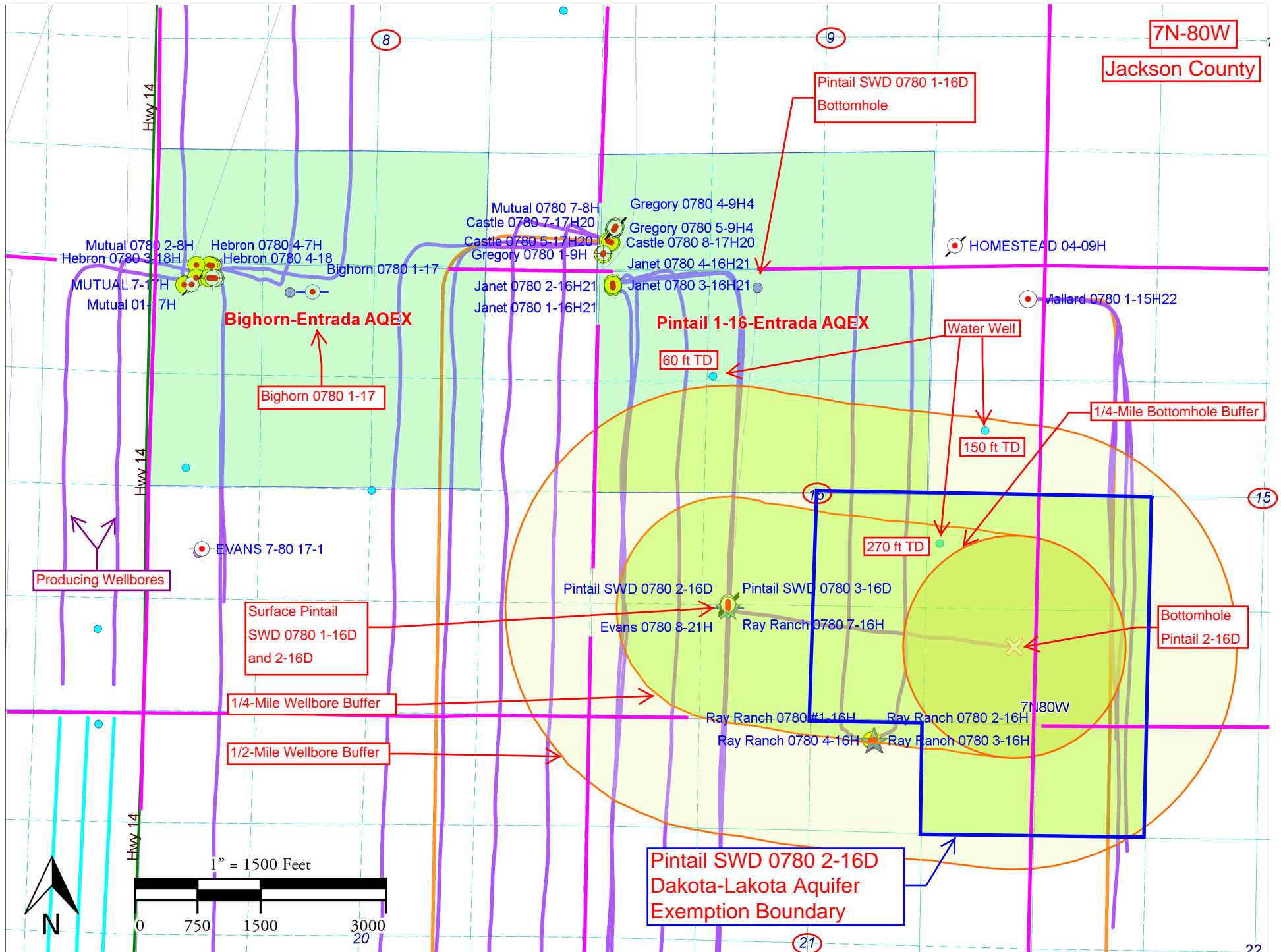
Robert P. (Bob) Koehler
UIC Lead - Geology Advisor

Telephone: 303-894-2100 x5147

Email: Bob.Koehler@state.co.us

Attachments:
Wellbore Diagram
Area Map

Sandridge: Bighorn 1-17, Pintail 1-16D and 2-16D Area





Current WBD

Field N Park Horiz Nbr
County Jackson
State CO
Well PINTAIL SWD 0780 2-16D
SH Location SEC 16, TWP 7N, RNG 80W
Elevations 8163' KB; 8141' GL
API # 505706566

Wellbore Schematic

Original Completion (2/23/2018) ☒
Current ☒
Workover ☐
Proposed ☐

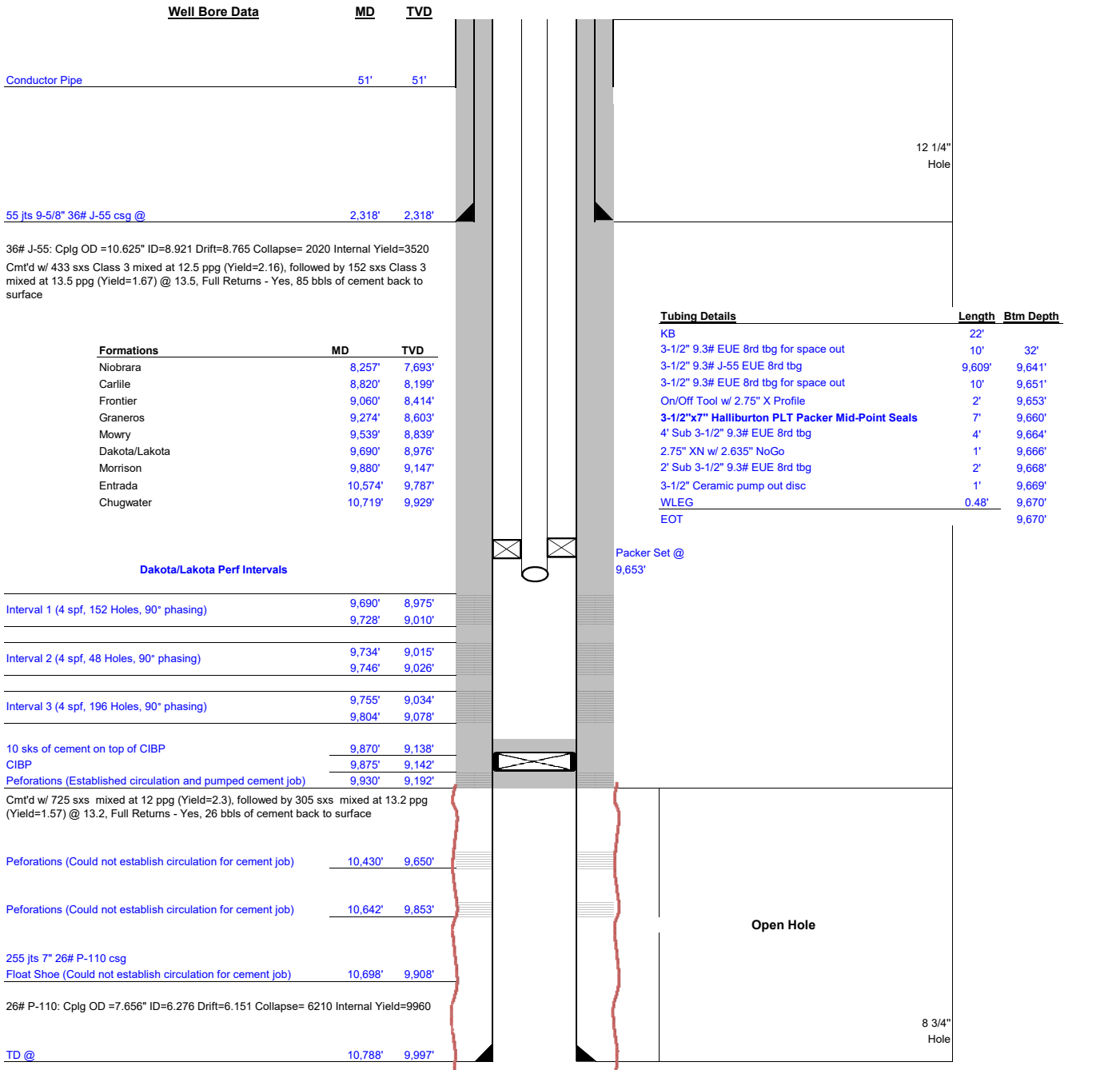


Table 1

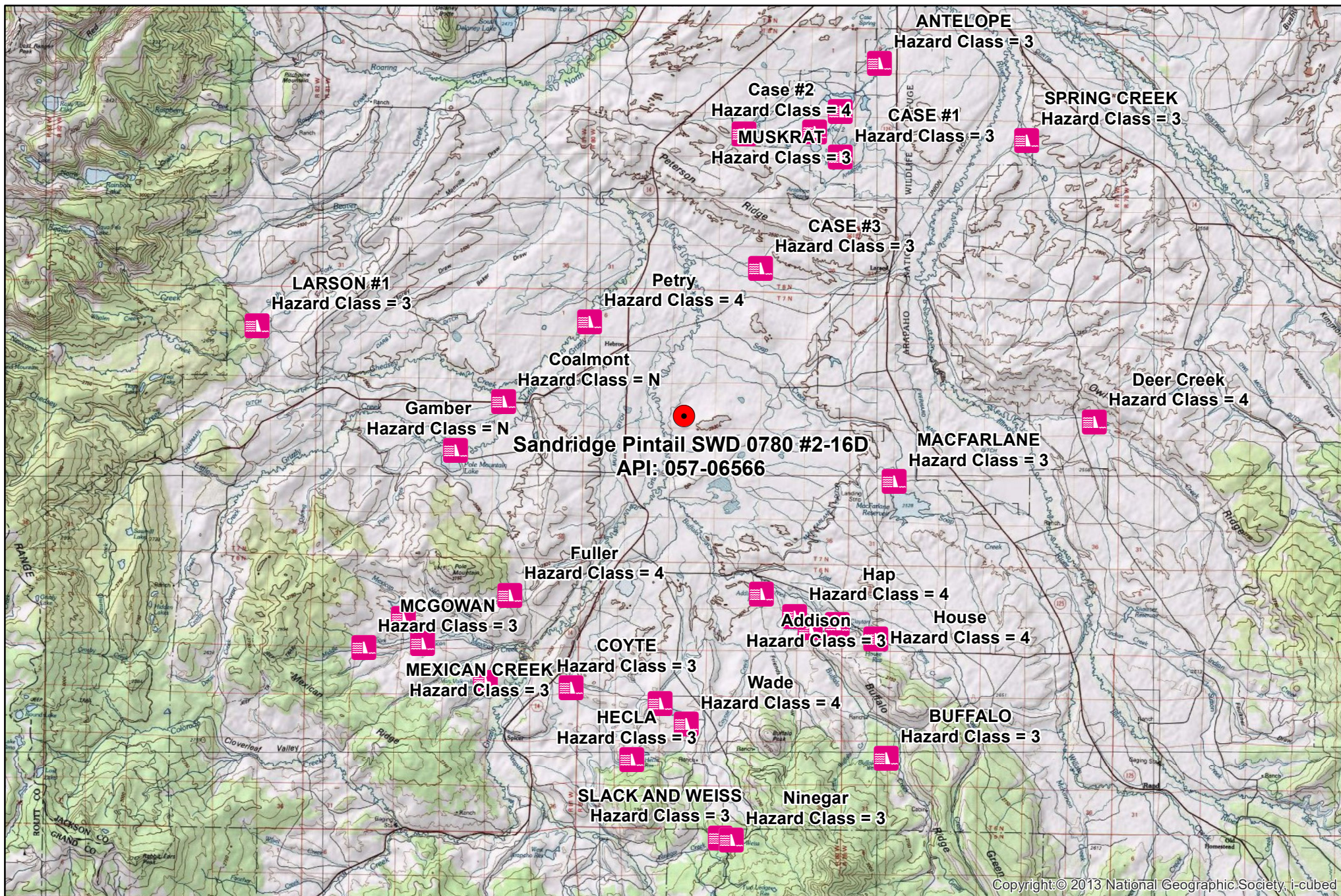
RECEIPT	PERMIT	WELL NAME	USE	AQUIFER	DEPTH	OWNER
---------	--------	-----------	-----	---------	-------	-------

Table 2

Structure Type	WDID	Associated Permits	Associated Case Numbers	Structure Name	More Info
----------------	------	--------------------	-------------------------	----------------	-----------

Table 3

API_NUM	WELL_NAME	WELL_STATUS	PLSS_LOCATION	OPERATOR_NAME
05-057-06560	Ray Ranch 0780 5-16H	ABANDONED LOCATION	NESW 16 7N 80W 6	SANDRIDGE EXPLORATION & PRODUCTION LLC
05-057-06561	Ray Ranch 0780 6-16H	ABANDONED LOCATION	NESW 16 7N 80W 6	SANDRIDGE EXPLORATION & PRODUCTION LLC
05-057-06562	Pintail SWD 0780 1-16D	INJECTING	SESW 16 7N 80W 6	SANDRIDGE EXPLORATION & PRODUCTION LLC
05-057-06563	Ray Ranch 0780 8-16H	ABANDONED LOCATION	NESW 16 7N 80W 6	SANDRIDGE EXPLORATION & PRODUCTION LLC
05-057-06564	Ray Ranch 0780 7-16H	ABANDONED LOCATION	NESW 16 7N 80W 6	SANDRIDGE EXPLORATION & PRODUCTION LLC
05-057-06565	Evans 0780 8-21H	DRILLING	SESW 16 7N 80W 6	SANDRIDGE EXPLORATION & PRODUCTION LLC
05-057-06566	Pintail SWD 0780 2-16D	SHUT IN	SESW 16 7N 80W 6	SANDRIDGE EXPLORATION & PRODUCTION LLC
05-057-06567	Pintail SWD 0780 3-16D	PERMITTED WELL LOCATION	SESW 16 7N 80W 6	SANDRIDGE EXPLORATION & PRODUCTION LLC

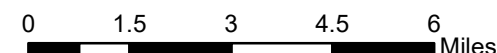


Sandridge Exploration & Production LLC **Pintail SWD 0780 #2-16D** **Dams within 10 miles**



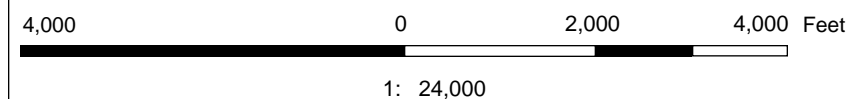
COLORADO
 Division of Water Resources
 Department of Natural Resources

1 inch = 15,000 feet





This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.



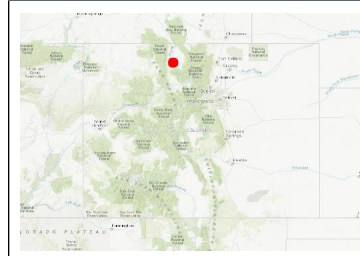
Legend

- ## All Structures

- Surface Water
Ground Water
Reservoir
Minimum Flow
Other

- Surface Water
- Well Constructed
- OGCC Well
- ◆ Geophysical Log
- County

Location



Notes

Date Prepared: 3/31/2020 7:31:00 AM