



COLORADO
 Division of Water Resources
 Department of Natural Resources

1313 Sherman Street, Room 821
 Denver, CO 80203

MEMORANDUM

TO: Robert P. Koehler, PhD, Oil & Gas Conservation Commission
 FROM: Andrew Flor, Hydrogeologist
 DATE: July 18, 2018
 SUBJECT: Water Injection Project - Cascade Creek 604-12-13-SWD (API: 05-045-13465)
 SW NW S4 T6S R97W, Garfield County
 Laramie Energy LLC

On June 26, 2018 you sent a memo describing a proposal by Laramie Energy LLC to construct a new well, Cascade Creek 604-12-13-SWD, for injection into the Ohio Creek and Williams Fork Formations of the Mesaverde Group. The injection interval for the Ohio Creek Formation is 6,413-6,257 feet measured depth (MD) and the injection interval for the Williams Fork Formation is 6,527-6,631 feet MD. The well will be located in the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 4, Township 6 South, Range 97 West of the Sixth Principal Meridian in Garfield County. The well will be approximately 15 miles north of De Beque, CO and 11 miles northwest of Parachute, CO.

The proposed well completion information indicates that this well will be constructed with a 20-inch conductor casing grouted from ground surface to a depth of 60 feet. 9-5/8-inch surface casing will extend to a depth of 2,524 feet and will be cemented back up to the surface. 5-1/2-inch casing will extend to a depth of 9,582 feet and will be cemented back up to 2,024 feet MD.

There are no completed water supply wells of record within $\frac{1}{2}$ mile of the wellhead, as shown in Table 1. There are two water rights structures (springs) within $\frac{1}{2}$ mile of the proposed wellhead as shown in Table 2. There are 40 COGCC oil/gas wells within $\frac{1}{2}$ mile of the proposed wellhead as shown in Table 3. A PDF output from AquaMap delineating a $\frac{1}{2}$ 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 blue squares. There are six dams within 10 miles of this injection well. The dams and hazard ratings are shown on an attached map.

The shallow geology of this area consists of relatively thick packages of Quaternary aged gravel and alluvium in valleys between the Tertiary aged Uinta, Green River, and Wasatch Formations. Below the Wasatch Formation lies the Mesa Verde Group, of which the Ohio Creek and Williams Fork Formations are the injection formations. The Ohio Creek Member likely outcrops approximately 30 miles to the south.



Due to the depth and poor water quality of the injection zone formation (TDS is estimated at 15,000 mg/L) it is not considered to be a source of potable groundwater at this location. Based on the information provided, injection into the Ohio Creek and Williams Fork 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).





COLORADO
Oil & Gas Conservation
Commission

Department of Natural Resources

1120 Lincoln Street, Suite 801
Denver, CO 80203

MEMORANDUM

June 26, 2018

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. This will be a directional new-drill commercial disposal well.

LOCATION	COUNTY	FIELD
Lot 12 Section 4, Township 6 South, Range 97 West, 6th P.M.	Garfield	Grand valley # 31290

WELL NAME	Laramie Energy LLC: CC #0697-04-SWD1 (API:TBD- Form 2: Doc#401442749)		
INJECTION ZONE FORMATION	Ohio Creek Formation	William Fork Formation	
DEPTH OF INJECTION INTERVAL	6,413-6,257 (Measured Depth)	6,527-6,631 (Measured Depth)	feet
PROPOSED INJECTION PRESSURE	0 - 2,500		psig
FRAC GRADIENT OR PRESSURE (BHP)	0.65 (estimate)		psi/ft
VOLUME OF FLUID TO BE INJECTED	0-10,000		bbl/day
TDS OF INJECTION ZONE FLUID	15,000		mg/L
TDS OF FLUID TO BE INJECTED	TBD		mg/L

WELL CONSTRUCTION DATA: CC #0697-04-SWD1								
CASING STRING	HOLE SIZE	CASING SIZE	CSG WT.	CSG TOP	SET DEPTH	CEMENT VOLUME	CEMENT TOP	CEMENT BOTTOM
Conductor String	26"	20"	112#	0'	60'	100 sks	0'	60'
Surface String	14-3/4"	9-5/8"	36#	0'	2,524'	1,132 sks	0'	2,524'
First String	8-3/4"	5-1/2"	17#	0'	9,582'	1,389 sks	2,024'	9,582'

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.

P 303.894.2100 F 303.894.2109 www.colorado.gov/cogcc

Commissioners: Andrew L. Spielman - Chair, Ashley L. Ager, John H. Benton,
James W. Hawkins, Tommy Holton, Kent Jolley, W. Perry Pearce, Robert W. Randall, Dr. Larry Wolk
John W. Hickenlooper, Governor | Robert W. Randall, Executive Director, DNR | Matthew J. Lepore, Director



Table 1

RECEIPT	PERMIT	WELL NAME	USE	AQUIFER	DEPTH	OWNER	MORE INFO
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Table 2

Structure Type	WDID	Associated Permits	Associated Case Numbers	Structure Name	More Info
Spring	7005153			Cities Service Spg 17	http://www.dwr.state.co.us/structure/structure.aspx?wd=70&strid=5153
Spring	3905435			Cities Service Spg 19	http://www.dwr.state.co.us/structure/structure.aspx?wd=39&strid=5435

Table 3

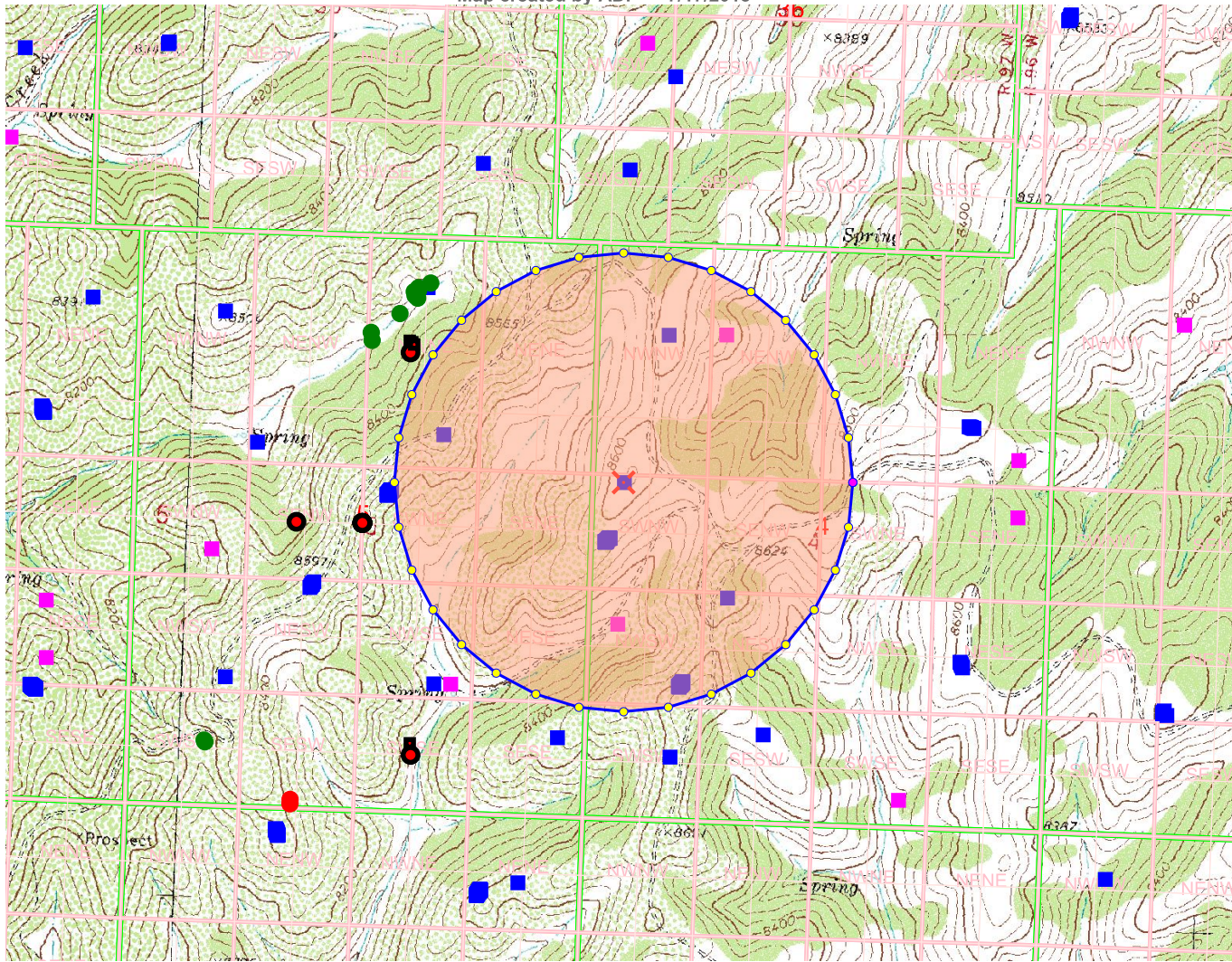
API_NUM	WELL_NAME	WELL_STATUS	PLSS_LOCATION	OPERATOR_NAME
05-045-07346	CASCADE CREEK 604-2	ABANDONED LOCATION	NESW 4 6S 97W 6	OXY USA INC
05-045-10676	CASCADE CREEK 697-5-14	ABANDONED LOCATION	LOT 11 5 6S 97W 6	OXY USA WTP LP
05-045-20999	Cascade Creek 697-04-34A	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21000	Cascade Creek 697-05-24A	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21004	Cascade Creek 697-04-49B	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21006	Cascade Creek 697-04-26B	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21009	Cascade Creek 697-05-32B	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21010	Cascade Creek 697-04-41	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21011	Cascade Creek 697-04-51B	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21012	Cascade Creek 697-04-42	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21014	Cascade Creek 697-05-24B	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21015	Cascade Creek 697-04-51A	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21016	Cascade Creek 697-04-34B	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21019	Cascade Creek 697-04-43	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21023	Cascade Creek 697-05-32A	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21027	Cascade Creek 697-04-26A	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-21028	Cascade Creek 697-04-49A	ABANDONED LOCATION	Lot 16 4 6S 97W 6	OXY USA WTP LP
05-045-10194	OXY FEDERAL 604-11	PRODUCING	NWNW 4 6S 97W 6	OXY USA WTP LP
05-045-13465	CASCADE CREEK 604-12-13	PRODUCING	LOT 16 4 6S 97W 6	OXY USA WTP LP
05-045-20709	Cascade Creek 697-04-59A	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20710	Cascade Creek 697-09-04B	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20711	Cascade Creek 697-04-59C	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20712	Cascade Creek 697-09-02A	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20713	Cascade Creek 697-04-68	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20714	Cascade Creek 697-04-84B	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20715	Cascade Creek 697-04-84A	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20716	Cascade Creek 697-04-57A	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20717	Cascade Creek 697-05-63B	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20718	Cascade Creek 697-04-74A	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20719	Cascade Creek 697-09-12	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20720	Cascade Creek 697-04-67	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20721	Cascade Creek 697-04-57B	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20722	Cascade Creek 697-04-65A	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20723	Cascade Creek 697-04-76A	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20724	Cascade Creek 697-04-59B	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20725	Cascade Creek 697-05-63A	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20726	Cascade Creek 697-04-65B	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20728	Cascade Creek 697-04-82	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20729	Cascade Creek 697-04-76B	PRODUCING	NWSW 4 6S 97W 6	OXY USA WTP LP
05-045-20727	Cascade Creek 697-09-04A	SHUT IN	NWSW 4 6S 97W 6	OXY USA WTP LP

AQUAMAP

Colorado Division of Water Resources

Laramie Energy CC 604 12 13 SWD Half Mile

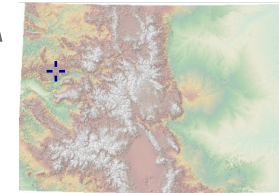
Map created by ADF 7/17/2018



14,235 ft

11,000 ft

MAP NAVIGATION



Click to create PDF
 UTM X, Zone 13: 224397
 UTM Y, Zone 13: 4383212
 Long: -108° 12' 27.5"
 Lat: 39° 33' 15.6"
 UTM and Geographic(LL) coordinates in NAD 83

DATA DISPLAY

- Background
 - Counties
 - Water Well Application
 - Quad Maps ▼
 - PLSS
 - DWR Parcels
 - Roads
 - EPA Well Notification
 - Hydrography
 - Oil/Gas Well Location
 - County Parcels (No Public Access)
 - Towns
 -
- Low ● High
- Transparency ▬

LOCATION

Section	Township	Range	Meridian
4 ▼	6 ▼	S ▼	97 ▼
W ▼	Sixth ▼		

PRINTING

Output Scale	Page Size	User
24,000 ▼	8.5x11 ▼	ADF

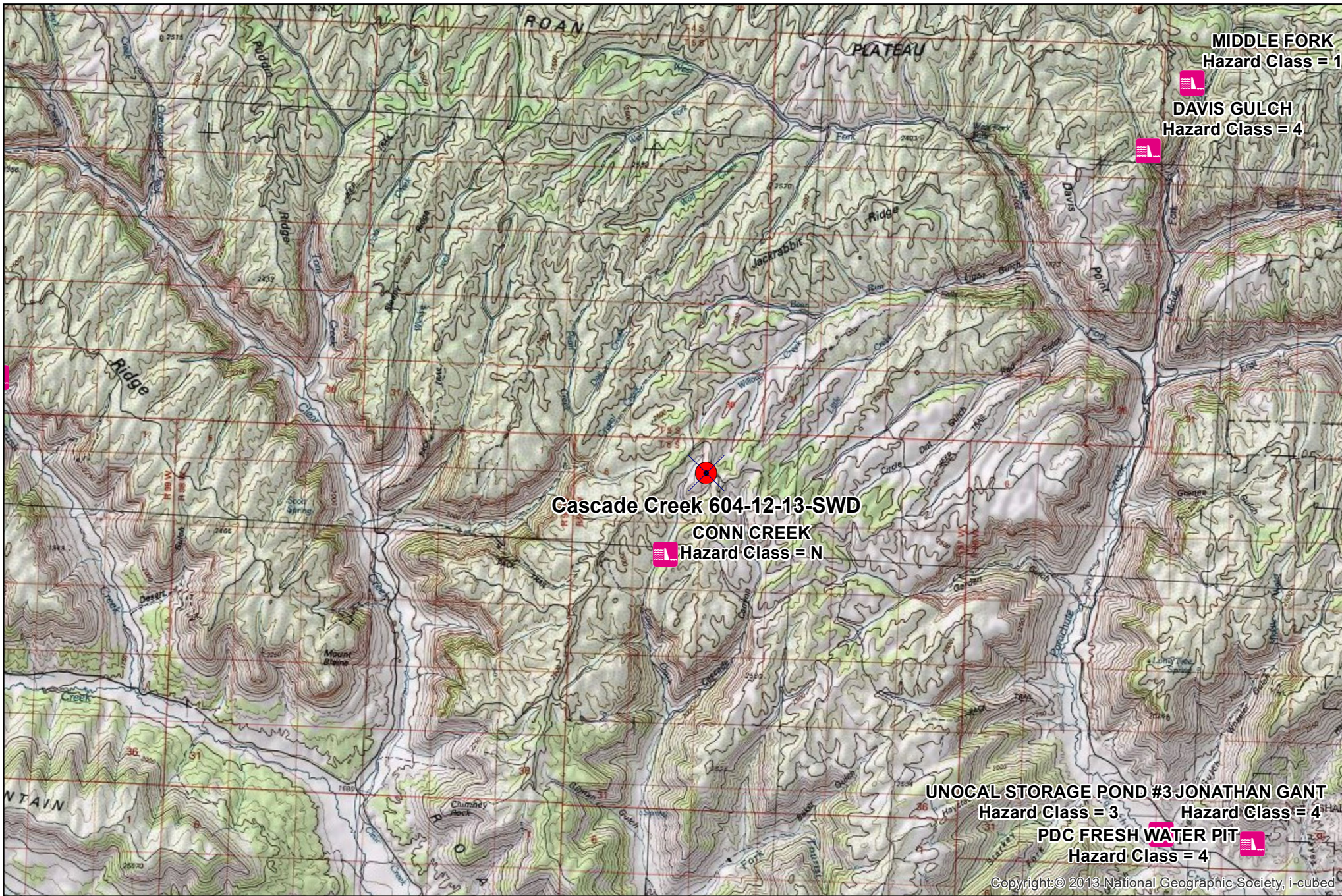
Title

Note: The well locations displayed on AquaMap are based on location information provided by well permit application forms and are only as accurate as the information provided. The actual physical locations of all wells have not been field verified and may vary from the location displayed. Refer to a copy of the original well permit file, available on the Division of Water Resources website, for well location details.



Based on work developed at <http://www.carto.net>

Address location by Bing Maps
 AquaMap Version 3.0.1 July 5, 2009



Laramie Energy LLC
Cascade Creek 604-12-13-SWD
Dams within 10 miles