



COLORADO
Oil & Gas Conservation
Commission

Department of Natural Resources

1120 Lincoln Street, Suite 801
Denver, CO 80203

Doc # 2618982

MEMORANDUM

May 31, 2019

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 well as summarized below. Please note that this is the third of three Underground Injection Control-Disposal wells being constructed by EWS 4 DJ Basin LLC (aka, Expedition Water Solutions Colorado LLC) at this location. The other wells are the EWS-4 and EWS-4A which have similar in construction and injection characteristic to the EWS-4B outlined here.

LOCATION	COUNTY	FIELD
NESE Section 18 Township 2 North Range 63 West, 6th P.M.	Weld	Wattenberg #90750

WELL NAME	EWS 4 DJ Basin LLC: EWS-4B (API: 123-48766)	
INJECTION ZONE FORMATION	Lyons, Lower Satanka, Wolfcamp, Amazon, Council Grove, Admire, Virgil, Missouri, and Fountain Formations	
DEPTH OF INJECTION INTERVAL	9,423-11,196 MD est.	feet
PROPOSED INJECTION PRESSURE	2,250	psig
FRAC GRADIENT OR PRESSURE (BHP)	0.874-0.881-Step Rate Test	psi/ft
VOLUME OF FLUID TO BE INJECTED	20,000-30,000 est.	bbl/day
TDS OF INJECTION ZONE FLUID	16,290-34,890	mg/L
TDS OF FLUID TO BE INJECTED	12500 est.	mg/L



WELL CONSTRUCTION DATA							
CASING STRING	HOLE SIZE	CASING SIZE	CSG/LIN WT.	CSG/LIN TOP	SET DEPTH	AMOUNT CEMENT	CEMENT TOP
Conductor	24"	16"	42#	0'	113'	177 sks	0'
Surface String	13-1/2"	9-5/8"	36#	0'	2,515'	905 sks	0'
First String	8-1/2"	7"	26#	0'	9,422'	374 sks	5,911'
Stage Tool	8-1/2"	7"	26#	0'	5,911'	670 sks	3172'
1st Liner	6-1/8"	4-1/2"	11.6#	9364'	10,770'	0 sks	NA
Open Hole	6-1/8"			Top 10,770	Bottom 11,196		

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.



June 14, 2019

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

Subject: Water Injection Project - EWS #4B
NESE Section 18, T2N, R63W, 6th PM
Expedition Water Solutions Colorado LLC, Weld County

On May 31, 2019 your office sent a memo describing a proposal by Expedition Water Solutions Colorado LLC to construct a new well, EWS #4B, for injection into the interval 9,423-11,196 feet below ground surface (measured depth). This interval represents the approximate depths for the following formations; Lyons, L. Satanka, Wolfcamp, Amazon, Council Grove, Admire, Virgil, Missouri, and Fountain Formations. The EWS #4B well will be located in the NE¼ of the SE¼ of Section 18, Township 2 North, Range 63 West of the Sixth Principal Meridian in Weld County. The well will be located approximately three miles northeast of the Town of Keenesburg.

The proposed well completion information indicates that this well will be constructed with 16-inch conductor casing set from ground surface to a depth of 113 feet. 9-5/8-inch surface casing will then be set from ground surface to a depth of 2,515 feet and grouted from 2,515 feet back up to the surface. 7-inch casing will extend to a depth of 9,422 feet and be cemented from 9,422 feet back up to 3,172 feet in two placements. 4-1/2-inch slotted liner will then be placed from 9,364 to a total depth of 10,770 feet MD and left ungrouted. The borehole will extend to a total depth of 11,196 feet and will be left as open borehole, without casing or grout.

There are 6 water supply wells of record within ½ mile of the proposed injection well, as shown in Table 1. There are zero water right structures within ½ mile of the proposed wellhead, as shown in Table 2. There are 6 COGCC oil/gas wells within ½ mile of the proposed wellhead, as shown in Table 3. A PDF output from Aquamap delineating a ½ mile radius from the proposed injection well is attached. Water supply wells are shown with green or red circles, decreed water rights structures are shown with magenta squares, and oil & gas wells are shown in blue squares. There are 21 dams within 10 miles of this injection well. The dams and hazard ratings are shown on an attached map.

The existing water supply wells in this area likely produce from Quaternary age eolian deposits at depths generally less than 30 feet or the Arapahoe Aquifer at depths generally less than 100 feet. The Laramie-Fox Hills aquifer underlies the Arapahoe Aquifer and extends from a depth of approximately 450 feet below ground surface to 750 feet below ground surface. The Pierre Shale also underlies the Fox Hills Sandstone at this location. Recently, the Upper Pierre Aquifer has begun to be developed as a source of fresh water in Northern Colorado. The Upper Pierre Aquifer extends to a depth of approximately 1,750 feet below ground surface.



Recipient
Date
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Due to the depth and assumed poor water quality of the injection zone formations, they are not considered to be sources of potable groundwater at this location. Based on the information provided, injection to the Lyons, L. Satanka, Wolfcamp, Amazon, Council Grove, Admire, Virgil, Missouri, and Fountain Formations through a properly constructed well should not negatively impact existing groundwater or surface water resources in the vicinity. The well should be constructed with grouted casing extending to a depth of at least 1,750 feet below ground surface to adequately protect the Upper Pierre Aquifer from contamination. If you have any questions or require additional information, please feel free to contact me.

Sincerely,

Andy Flor

Hydrogeologist

andrew.flor@state.co.us

303.866.3581 x8218

Table 1

RECEIPT	PERMIT	USE	AQUIFER	DEPTH	OWNER
3684370		Domestic	Laramie-Fox Hills		MIELECIO CHAVEZ
57161	57161-MH	Monitoring/Sampling	Quaternary Alluvium		EXPEDITION WATER SOLUTIONS
3669999	297713	Livestock	Laramie-Fox Hills		KAUFFMAN BROTHERS AND JULIUS PLUSS
9063847	36519	Domestic	All Unnamed Aquifers	31	FOOS EDWARD AND HERBERT
9064811	55594	Domestic	All Unnamed Aquifers		KAUFFMAN ELMER J AND PLUSS J A

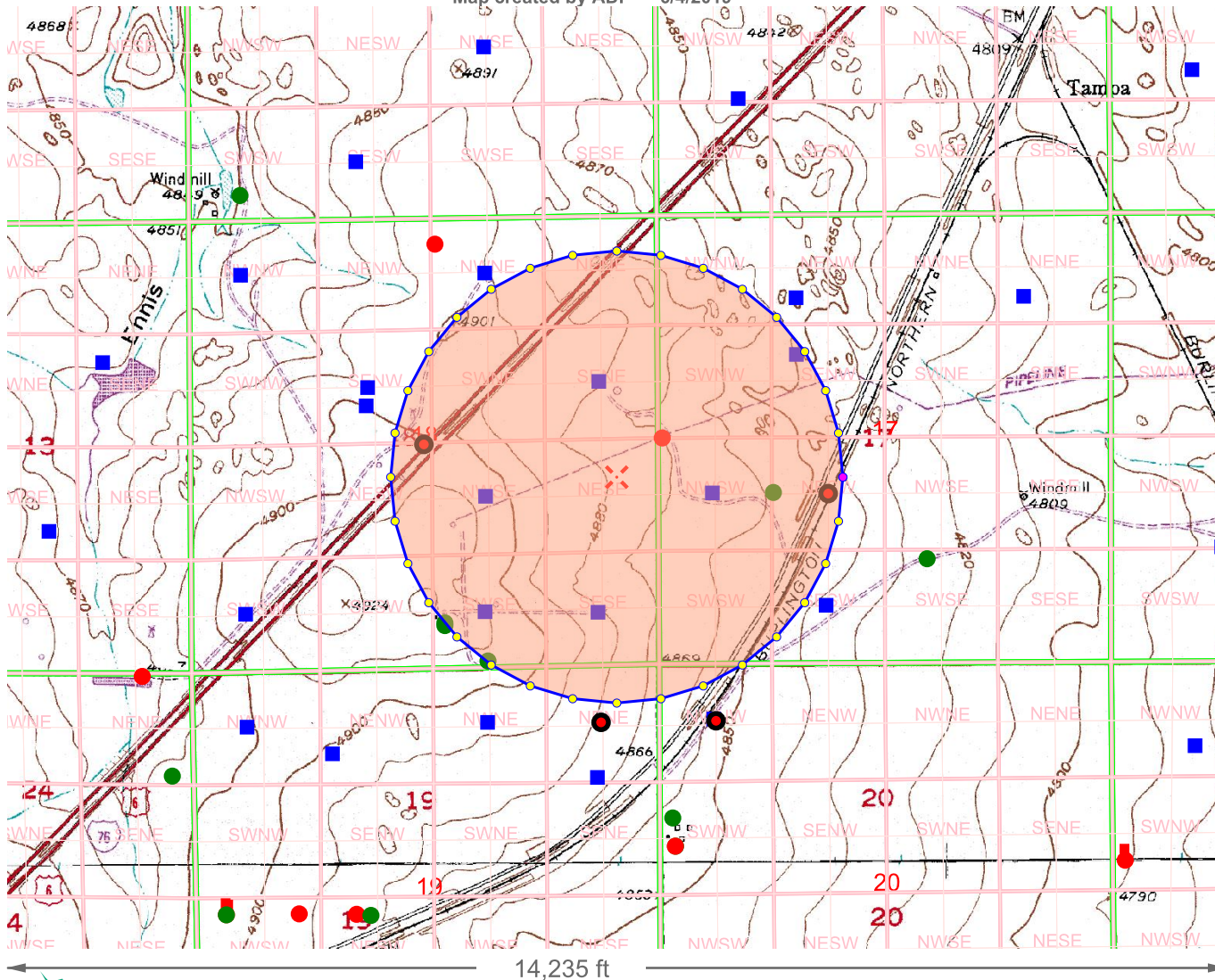
Table 2

Structure Type	WDID	Associated Permits	Associated Case Numbers	Structure Name	More Info
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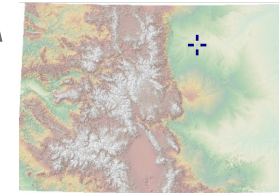
API_NUM	WELL_NAME	WELL_STATUS	PLSS_LOCATION	OPERATOR_NAME
05-123-07218	UPRR 34 PAN AM 1	DRY AND ABANDONED	NWSW 17 2N 63W 6	AMOCO PRODUCTION CO.
05-123-11119	CHAMPLIN 1-17	DRY AND ABANDONED	SEW 17 2N 63W 6	MONAHAN REX ESTATE
05-123-07865	ELMER KAUFMAN 3	PLUGGED AND ABANDONED	SENE 18 2N 63W 6	U S MINERALS EXPL
05-123-40000	ELMER KAUFMAN 1	PLUGGED AND ABANDONED	NWSE 18 2N 63W 6	SANDS-AMERICAN CORP
05-123-07611	ELMER KAUFMAN 2	PRODUCING	SWSE 18 2N 63W 6	FOUNDATION ENERGY MANAGEMENT LLC
05-123-07952	KAUFMAN 4	PRODUCING	SESE 18 2N 63W 6	FOUNDATION ENERGY MANAGEMENT LLC

AQUAMAP Colorado Division of Water Resources EWS 4B Half Mile Radius

Map created by ADF 6/4/2019



MAP NAVIGATION



Click to create PDF
 UTM X, Zone 13: 545948
 UTM Y, Zone 13: 4443601
 Long: -104° 27' 38.2"
 Lat: 40° 8' 29.4"
 UTM and Geographic(LL)
 coordinates in NAD 83

DATA DISPLAY

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

LOCATION

Section	Township	Range	Meridian
18 ▼	2 ▼	N ▼	63 ▼
PLSS Locator		Quick Zoom	
Spacing			

PRINTING

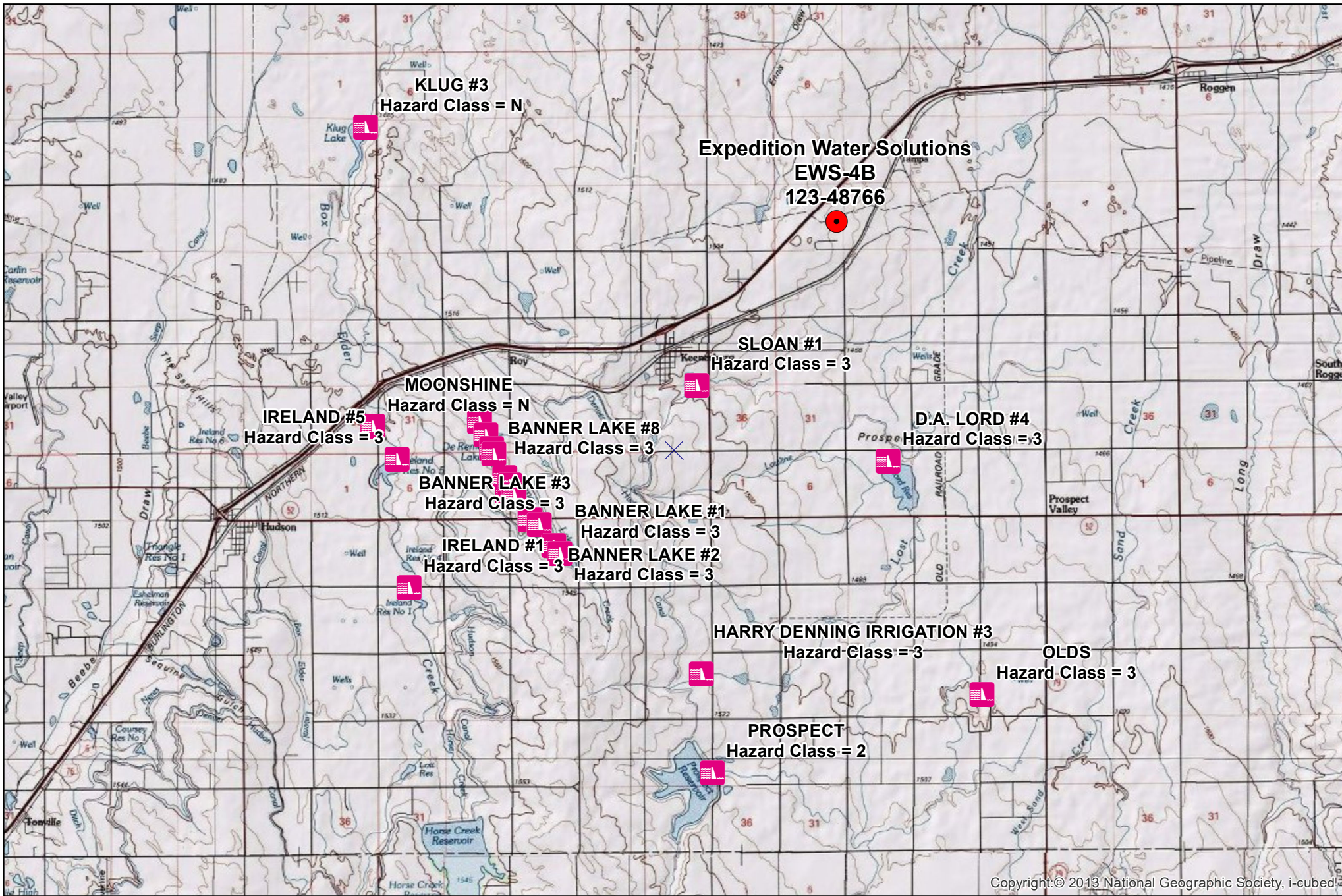
Output Scale	Page Size	User
24,000 ▼	8.5x11 ▼	ADF
Title <input type="text" value="EWS 4B Half Mile Radius"/>		

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



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Expedition Water Solutions EWS-4B Dams within 10 miles