Additional Information

Waterbridge Stateline Berdan Fed SWD#1

From: Oliver Seekins
To: Harris, Anthony, EMNRD; Tom Tomastik
Cc: Goetze, Phillip, EMNRD; Gebremichael, Million, EMNRD
Subject: [EXTERNAL] RE: Waterbridge Stateline - Berdan Fed SWD#1
Date: Tuesday, November 7, 2023 2:54:50 PM
Attachments: image002.png
image003.png
015-27459 resistivity log.tif
30-015-27459 GRND log.tif

Tony:

Attached are the correct logs (both resistivity and GRND logs) and API No (30-015-27459) which I used to identify the lower confining zones below the proposed injection zone in the Cisco Formation. Below are our responses to the provided questions:

1. **Hydrocarbon Production:** ALL Consulting (ALL) conducted a complete review of all surrounding wells within a two-mile radius of the proposed Berdan Fed SWD #1 location for potential hydrocarbon production within the Cisco Formation. There is no hydrocarbon production in the Cisco Formation in the area of the proposed Berdan Fed SWD #1 well and there are no wells in the ½ mile radius.
2. **Production Casing Cementing:** ALL's proposed cementing program for the 9-5/8" production casing is a two-stage cement job with the second stage from the DV tool at 5,400 feet and cementing at least 200 feet back up inside the 13-3/8" intermediate casing to create complete isolation on the Cisco Formation injection interval. Our concern with attempting to cement the 9-5/8" production casing to the surface is in order to do that, a light lead cement would need to be used to avoid any potential for loss of cement into exposed formations due to the weight of the Class C cement. Use of a light cement can in its own case present a problem if a lightweight cement is affected by any shallow gas or fluid invasion into the wellbore and lead to a poor cement job on the second stage. Remedial cementing on production casing requires squeeze jobs with perforations, which with a saltwater disposal well can lead to failure of mechanical integrity due to leaking squeeze perforations. Our understanding of the the Underground Injection Control Program, only requires Class II and Class VI injection wells to have production casing cemented to the surface. ALL believes cementing of the 9-5/8" production casing is not warranted in this case and could become problematic.
3. **Logs:** Complete logs for both resistivity and gamma ray/neutron-density are attached. ALL has discovered that on the log snips utilized for both the upper and lower confinement above and below the Cisco injection zone had the wrong API Number on the log snips. While the log snips were correct, the logs were for API No. 30-015-27459. Revised snips with the corrected APU numbers are attached and additional information has been added to demonstrate lower confinement of the Cisco injection zone. The additional information added to these log snips show high resistivity and low porosity for the lower confinement interval identified at the base of the Cisco Formation, which would prevent downward migration of injected fluids.

We hope that the above responses satisfy NMOCD's request and would be more then happy to

discuss any of the above points if you believe that would be beneficial.

Best Regards,

Oliver W. Seekins, PMP
Consultant / Project Manager
A.L.L. Consulting, LLC
1718 S. Cheyenne Ave.
Tulsa, Oklahoma 74119
office: 918-382-7581 Ext. 141
Cell: 918-805-5037

From: Harris, Anthony, EMNRD <Anthony.Harris@emnrd.nm.gov>
Sent: Monday, November 6, 2023 5:05 PM
To: Oliver Seekins <oseekins@all-llc.com>; Tom Tomastik <ttomastik@all-llc.com>
Cc: Goetze, Phillip, EMNRD <phillip.goetze@emnrd.nm.gov>; Gebremichael, Million, EMNRD <Million.Gebremichael@emnrd.nm.gov>
Subject: Waterbridge Stateline - Berdan Fed SWD#1

Good Afternoon Oliver

The subject well application is currently under review. Below are a list of items that have been identified during the review process.

1. Injection is proposed into the Cisco.
    a. Please provide a statement on the hydrocarbon potential (or lack thereof) for the Cisco formation in this area.
2. The 9-5/8" Production casing must be cemented to surface.
    a. Please provide an updated wellbore diagram with cement to surface, DV tool depth(s), cementing details etc.
3. Figure 7 in your application shows a log from offset well API# 30-015-10298
    a. Please provide a copy of that log including the log header information.

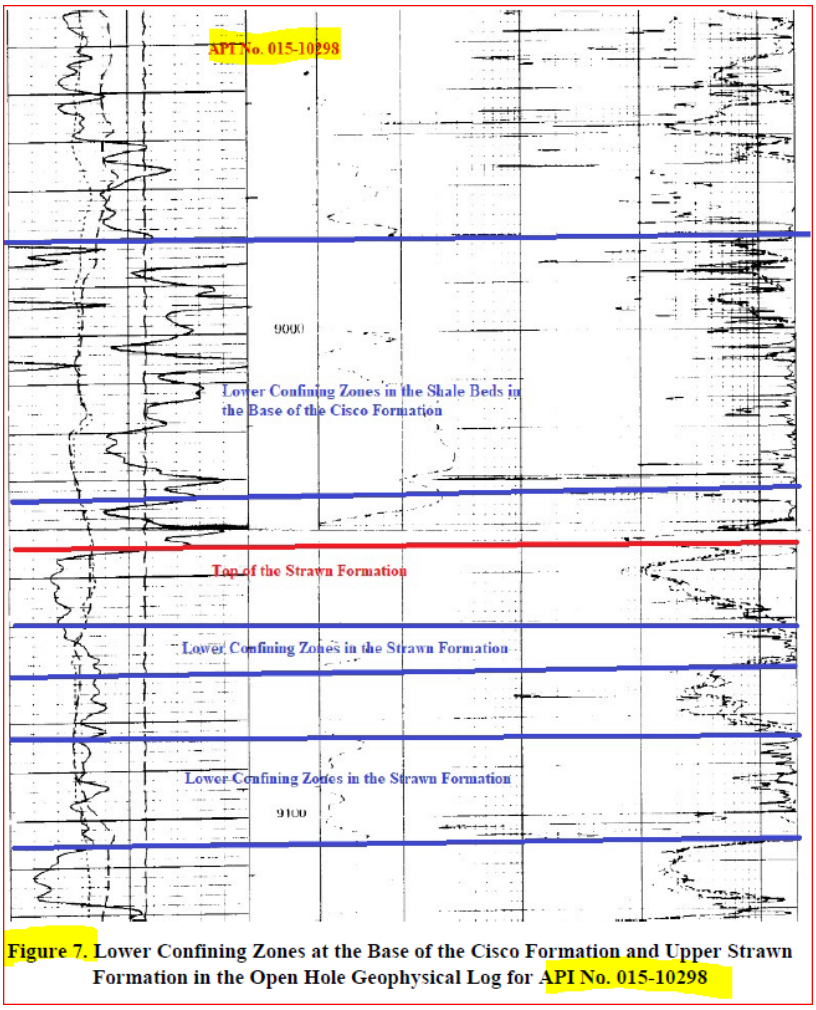
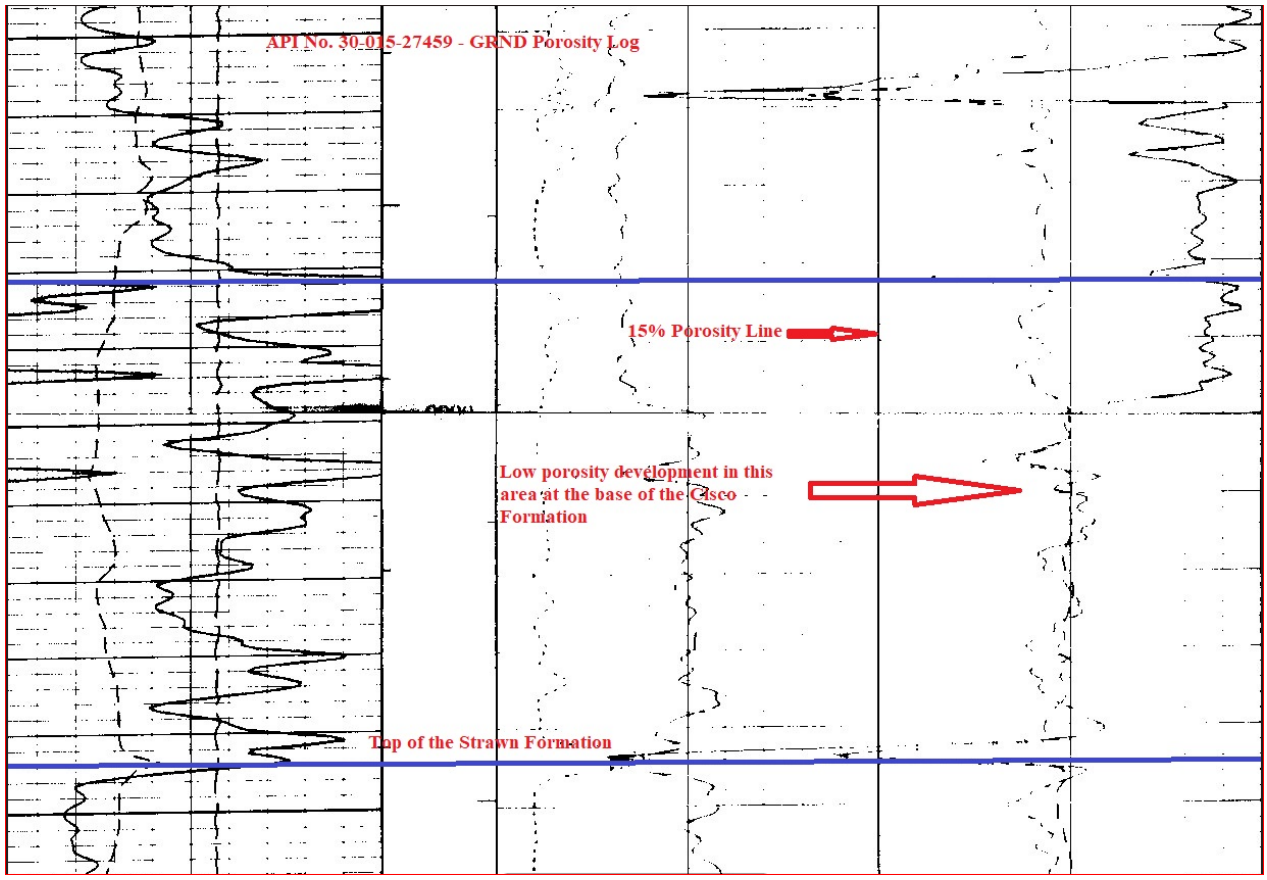
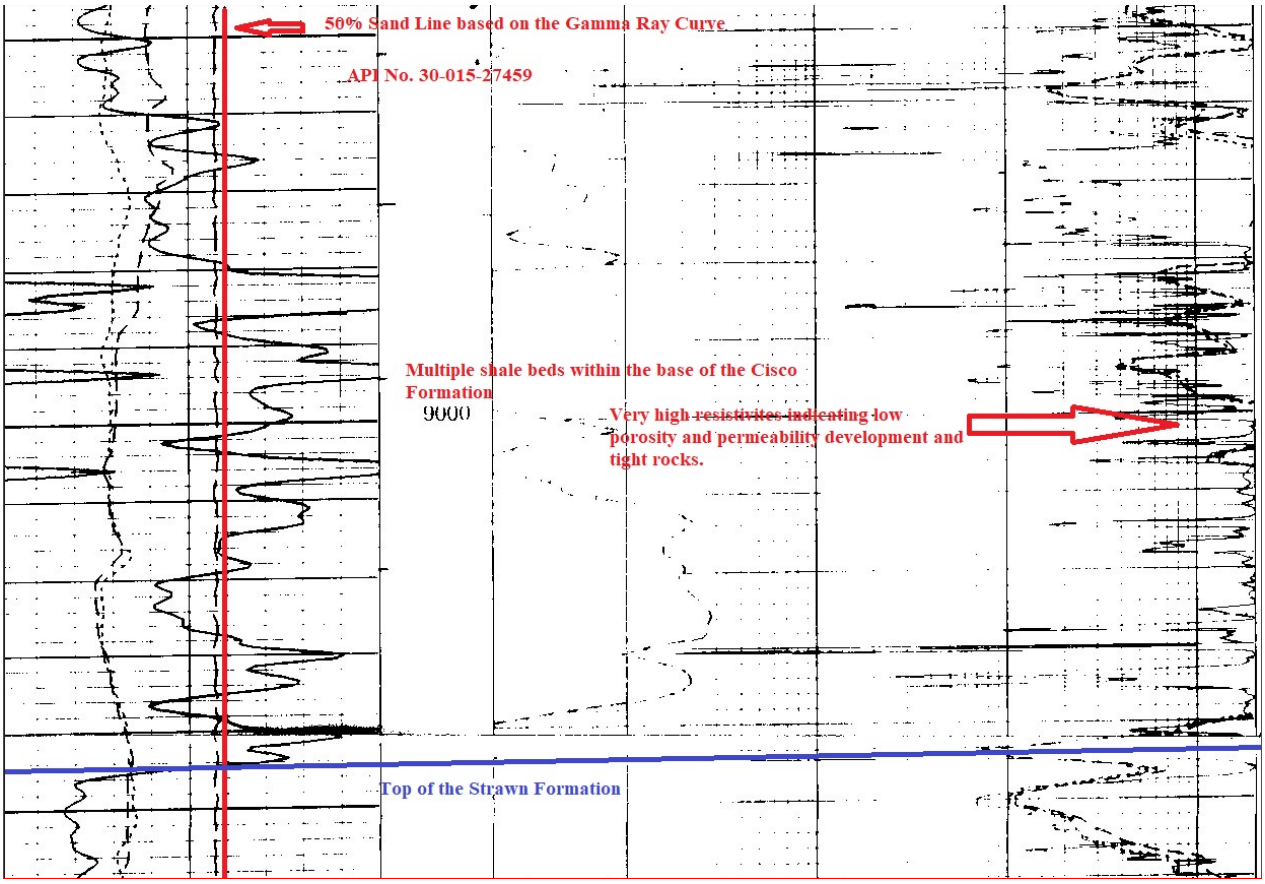


Figure 7. Lower Confining Zones at the Base of the Cisco Formation and Upper Strawn Formation in the Open Hole Geophysical Log for API No. 015-10298

Feel free to call me at 505 549 8131 if you have any questions or require clarification on the above request.

Regards
Tony Harris
Petroleum Specialist
Anthony.harris@emnrd.nm.gov
505 549 8131.


API No. 30-015-27459 - GRND Porosity Log
15% Porosity Line
Low porosity development in this area at the base of the Cisco Formation
Top of the Strawn Formation


50% Sand Line based on the Gamma Ray Curve
API No. 30-015-27459
Multiple shale beds within the base of the Cisco Formation
9000
Very high resistivites indicating low porosity and permeability development and tight rocks.
Top of the Strawn Formation

Additional Information

Berdan Fed SWD#1
(SWD-2570)

From: Oliver Seekins
To: Harris, Anthony, EMNRD; Tom Tomastik; Reed Davis
Cc: Goetze, Phillip, EMNRD; Gebremichael, Million, EMNRD
Subject: RE: [EXTERNAL] RE: Waterbridge Stateline - Berdan Fed SWD#1
Date: Friday, December 1, 2023 12:56:57 PM
Attachments: image002.png
image003.png
Waterbridge - Berdan FED SWD #1 revised.pdf
Berdan Fed SWD #1 - Supplemental Information - revised.pdf

Anthony,

Please see the revised WBD and the revised supplemental information as requested.

Please let us know if you have any additional questions or concerns.

Best Regards,

Oliver W. Seekins, PMP
Consultant / Project Manager
A.L.L. Consulting, LLC
1718 S. Cheyenne Ave.
Tulsa, Oklahoma 74119
office: 918-382-7581 Ext. 141
Cell: 918-805-5037

From: Harris, Anthony, EMNRD <Anthony.Harris@emnrd.nm.gov>
Sent: Monday, November 13, 2023 5:18 PM
To: Oliver Seekins <oseekins@all-llc.com>; Tom Tomastik <ttomastik@all-llc.com>
Cc: Goetze, Phillip, EMNRD <phillip.goetze@emnrd.nm.gov>; Gebremichael, Million, EMNRD <Million.Gebremichael@emnrd.nm.gov>
Subject: RE: [EXTERNAL] RE: Waterbridge Stateline - Berdan Fed SWD#1

Good Afternoon Oliver

Thank you for providing the additional information. With reference to the cementing requirements for the subject well, please note the following:

1. The Production casing must be cemented to surface.
    a. Please update the wellbore diagram to reflect this requirement together with supporting details/documentation (eg. # sacks, DV tool location etc).

If you have any questions, please reply-all.

Regards
Tony Harris
Petroleum Specialist
Anthony.harris@emnrd.nm.gov
505 549 8131.

From: Oliver Seekins <oseekins@all-llc.com>
Sent: Tuesday, November 7, 2023 2:55 PM
To: Harris, Anthony, EMNRD <Anthony.Harris@emnrd.nm.gov>; Tom Tomastik <ttomastik@all-llc.com>
Cc: Goetze, Phillip, EMNRD <phillip.goetze@emnrd.nm.gov>; Gebremichael, Million, EMNRD <Million.Gebremichael@emnrd.nm.gov>
Subject: [EXTERNAL] RE: Waterbridge Stateline - Berdan Fed SWD#1

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

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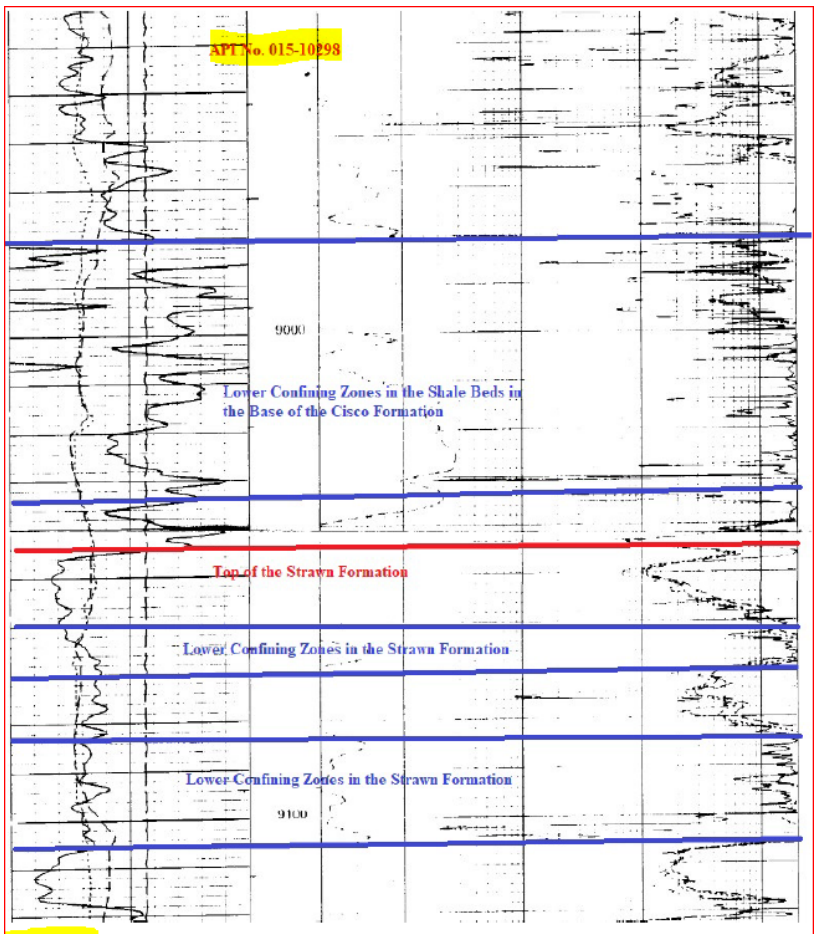

Figure 7. Lower Confining Zones at the Base of the Cisco Formation and Upper Strawn Formation in the Open Hole Geophysical Log for API No. 015-10298

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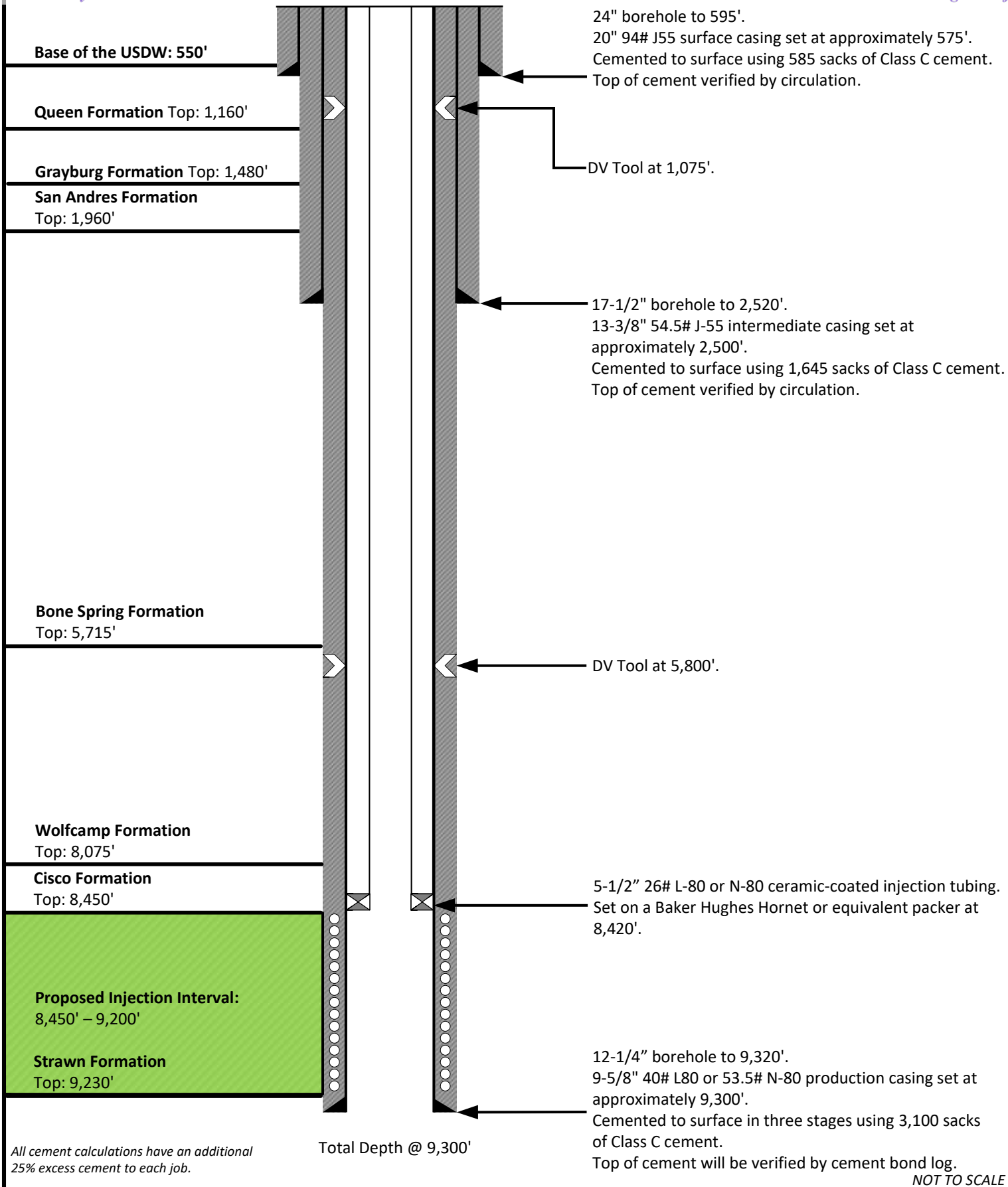

All cement calculations have an additional 25% excess cement to each job.

NOT TO SCALE

Prepared by:
ALL CONSULTING
Prepared for:
WATERBRIDGE

Drawn by: Reed Davis

Project Manager: Oliver Seekins

Date: 11/28/2023

Berdan FED SWD #1
WaterBridge Stateline LLC
Sec. 8 Town. 20S Rng. 27E
Lat: 32.591602° Long: -104.295454° (NAD 83)

Application for Authorization to Inject
Well Name: Berdan Fed SWD #1

III – Well Data (*The Wellbore Diagram is included as **Attachment 1***)

A.

(1) General Well Information:

Operator: WaterBridge Stateline LLC (OGRID No. 330129)
Lease Name & Well Number: Berdan Fed SWD #1
Location Footage Calls: 1,476 FNL & 292 FEL
Legal Location: Unit Letter H, S8 T20S R27E
Ground Elevation: 3,366'
Proposed Injection Interval: 8,450'- 9,200'
County: Eddy

(2) Casing Information:

Type	Hole Size	Casing Size	Casing Weight	Setting Depth	Sacks of Cement	Estimated TOC	Method Determined
Surface	24"	20"	94.0 lb/ft	575'	585	Surface	Circulation
Intermediate	17-1/2"	13-3/8"	54.5 lb/ft	2,500'	1,645	Surface	Circulation
Production Casing	12-1/4"	9-5/8"	40.0 lb/ft (L80) or 53.5 lb/ft (N-80)	9,300'	3,100	Surface	CBL
Tubing	N/A	5-1/2"	26.0 lb/ft	8,420'	N/A	N/A	N/A

DV Tool set at: 1,075' & 5,800'

(3) Tubing Information:

5-1/2" (26.0 lb/ft) ceramic-coated tubing with a setting depth of 8,420'

(4) Packer Information: Baker Hughes Hornet or equivalent packer set at 8,420'

B.

(1) Injection Formation Name: Cisco
Pool Name: SWD; Cisco
Pool Code: 96099
(2) Injection Interval: Perforated injection between 8,450'- 9,200'
(3) Drilling Purpose: New drill for saltwater disposal
(4) Other Perforated Intervals: No other perforated intervals exist.
(5) Overlying Oil and Gas Zones: Below are the approximate formation tops for known oil and gas producing zones in the area.

- Queen (1,160')
- Bone Spring (5,715')
- Wolfcamp (8,075')

Underlying Oil and Gas Zones: Below are the approximate formation tops for known oil and gas producing zones in the area.

- Strawn (9,230')

V – Well and Lease Maps

The following maps and documents are included in ***Attachment 2***:

- 2-mile Oil & Gas Well Map
- 1/2-Mile Well Detail List
- 2-Mile Lease Map
- 2-Mile Mineral Ownership Map
- 2-Mile Surface Ownership Map
- Potash Lease Map

VI – AOR Well List

There are no wells located within the 1/2-mile AOR, as shown by the 2-mile Oil & Gas Well Map included in ***Attachment 2.***

VII – Proposed Operation

(1) **Proposed Maximum Injection Rate:** 30,000 bpd
Proposed Average Injection Rate: 17,500 bpd

(2) A **closed-loop system** will be used.

(3) **Proposed Maximum Injection Pressure**: 1,690 psi (surface)
Proposed Average Injection Pressure: approximately 1,099 psi (surface)

(4) **Source Water Analysis:** It is expected that the injectate will consist of produced water from production wells completed in the Wolfcamp, Delaware and Bone Spring formations. Analysis of water from these formations is included as ***Attachment 3***.

(5) **Injection Formation Water Analysis:** The proposed SWD will be injecting water into the Cisco formation which is a non-productive zone known to be compatible with formation water from the Wolfcamp, Delaware and Bone Spring formations. Water analyses from the Cisco formation in the area are included as ***Attachment 4*.**

VIII – Geologic Description

The proposed injection interval includes the Cisco formation from 8,450'- 9,200' feet. This formation consists of interbedded carbonate rocks including dolomites and limestones. Several thick intervals of porous and permeable carbonate rock capable of taking water are present within the subject formation in the area.

The base of the USDW is the Yates formation at a depth of approximately 550 feet. Water well depths in the area range from approximately 130-300 feet below the ground surface.

Additional geologic information can be found in karst analysis included as ***Attachment 6.***

IX – Proposed Stimulation Program

A small cleanup acid job may be used to remove mud and drill cuttings from the formation. However, no other formation stimulation is currently planned.

X – Logging and Test Data

Logs will be submitted to the Division upon completion of the well.

XI – Fresh Groundwater Samples

Based on a review of data from the New Mexico Office of the State Engineer, one (1) groundwater well is located within 1 mile of the proposed SWD location. However, conversations with the water well owners and an in-person investigation have revealed that water well RA-08646 was permitted, but never drilled. As such, no water well samples were collected.

A water well map and details of the water well within 1 mile is included as ***Attachment 5***.

XII – No Hydrologic Connection Statement

No faulting is present in the area that would provide a hydrologic connection between the injection interval and overlying USDWs. Additionally, the casing program has been designed to ensure there will be no hydrologic connection between the injection interval and overlying USDWs.

A signed No Hydrologic Connection Statement is included as ***Attachment 7.***

XIII – Proof of Notice

A Public Notice was filed with the Carlsbad Current-Argus newspaper and an affidavit is included in ***Attachment 8***.

A copy of the application was mailed to the OCD district office, landowner, and all identified affected parties within 1/2-mile of the proposed SWD location. A list of the recipients, as well as delivery confirmations, are included in ***Attachment 8***.

Karst Analysis

In addition to the information formally requested as part of the C-108 application, ALL Consulting has included a Karst analysis as ***Attachment 6*** to address the identified concerns of permitting an SWD in a high-risk Karst area.

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 290358

CONDITIONS

Operator: WaterBridge Stateline LLC 5555 San Felipe Houston, TX 77056	OGRID: 330129
	Action Number: 290358
	Action Type: [IM-SD] Admin Order Support Doc (ENG) (IM-AAO)

CONDITIONS

Created By	Condition	Condition Date
anthony.harris	None	12/1/2023