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 Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

Form C-101
Revised July 18, 2013

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1. Operator Name and Address	2. OGRID Number
New Mexico Institute of Mining & Technology 801 Leroy Pl Socorro NM, 87801	15847
	3. API Number 30-045-38272

4. Property Code	5. Property Name	6. Well No.
332261	SJB Carbon Safe Strat Test SWD-2462 Permit #	1

7. Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
H	14	31N	12W		2236	North	1021	East	San Juan

8. Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County

9. Pool Information

Pool Name	Pool Code
SWD;Entrada	96436

Additional Well Information

11. Work Type	12. Well Type	13. Cable/Rotary	14. Lease Type	15. Ground Level Elevation
N	S	R	F	6,207'
16. Multiple	**17. Proposed Depth**	**18. Formation**	**19. Contractor**	**20. Spud Date**
N	8,800'	Entrada	Schlumberger	02/28/2022

Depth to Ground water >1000'	Distance from nearest fresh water well >1 mile	Distance to nearest surface water >1 mile

☒ **We will be using a closed-loop system in lieu of lined pits**

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Cond	30	20	94	100'	127	Surface
Surf	17-1/2	13- 3/8	54.5	1,500'	1216	Surface
Int	12-1/4	9-5/8	40.0	5,500'	1429	Surface
Prod	8-3/4	5-1/2	23.0	5,000'	2122	Surface

Casing/Cement Program: Additional Comments

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Double Ram	5000 psi	2500 psi	TBD

23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief. **I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☐, if applicable.** Signature:	OIL CONSERVATION DIVISION Approved By:
Printed name: William Ampomah	Title: Petroleum Specialist
Title: Asst. Professor, New Mexico Tech	Approved Date: 02/10/2022 Expiration Date: 02/10/2024
E-mail Address: William.ampomah@nmt.edu	
Date: 1/26/2022 Phone: 575-835-5018	Conditions of Approval Attached

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State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-045-38272	96436	SWD;Entrada

[4] Property Code	[5] Property Name	[6] Well Number
332261	SJB CARBON SAFE Strat Test	1

[7] OGRID No.	[8] Operator Name	[9] Elevation
15847	NEW MEXICO INSTITUTE OF MINING & TECHNOLOGY	6207'

[10] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	14	31-N	12-W		2236	NORTH	1021	EAST	SAN JUAN

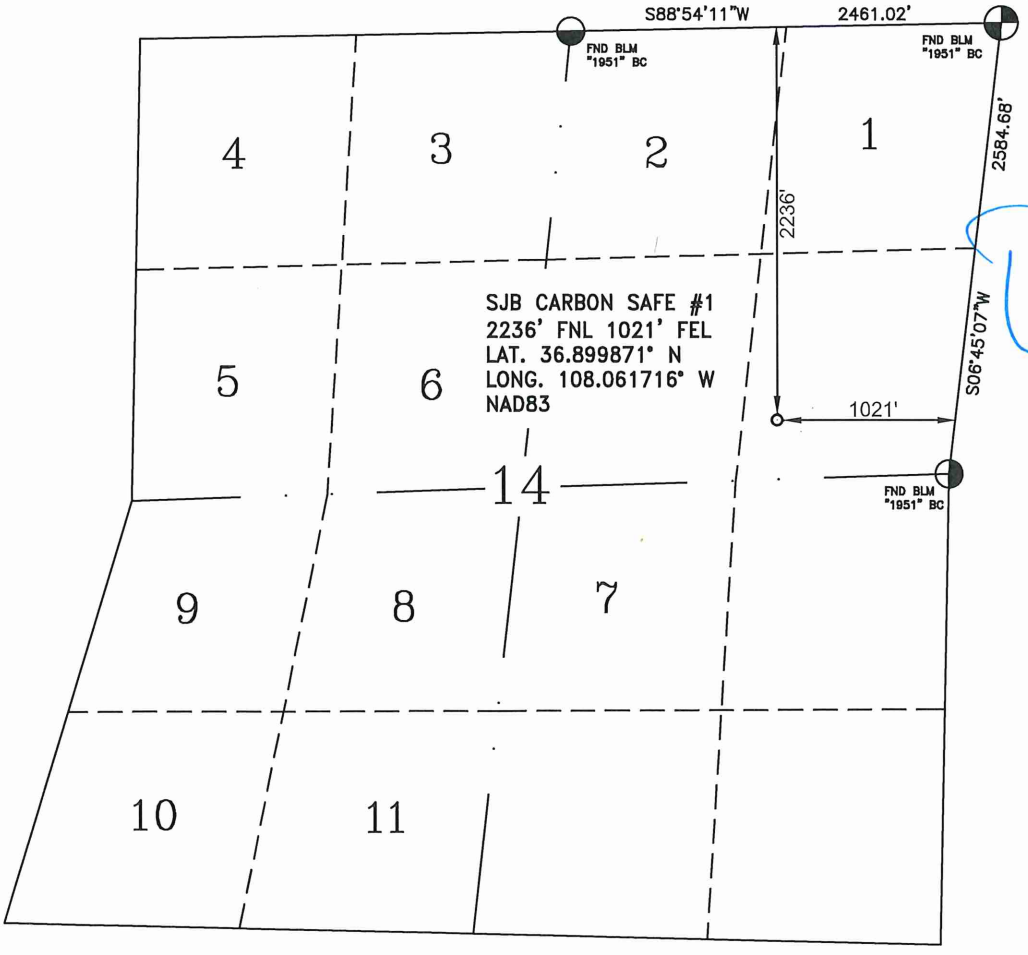
[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
			SWD-2462

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

16



[17] OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or a working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature 8/1/2022 Date

Vanessa Fields
Printed Name

Vanessa@usdshengr.net
E-mail Address

[18] SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

JULY 12, 2021
Date of Survey

Signature and Seal of Professional Surveyor:

GLEN W. RUSSELL
NEW MEXICO
15703
LICENSED PROFESSIONAL SURVEYOR

GLEN W. RUSSELL
Certificate Number 15703

Drilling Plan

Well Name: SJB CarbonSAFE #1

Well Location: Section 12, T 31 N, R 12 W, San Juan County, New Mexico.

-108.061174 and 36.899774.

San Juan County, New Mexico

1. Estimated Tops of Geological Markers (MD)

The estimated tops of important geological markers are as follows:

Formations/Groups	Measured Depth, ft
Ojo Alamo Ss.	1,330
Kirtland Sh.	1,920
Fruitland Fm.	2,059
Pictured Cliffs Ss.	2,769
Lewis Sh.	2,904
Mesaverde Grp.	4,334
Mancos Sh.	5,305
Greenhorn Ls.	7,073
Graneros Sh.	7,135
Dakota Ss.	7,185
Brushy Basin Mbr.	7,340
Salt Wash Mbr.	7,650
Bluff Fm.	7,920
Summerville Fm.	8,090
Todilto Fm.	8,173
Entrada Fm.	8,192
Carmel Fm.	8,306
Chinle Grp.	8,528

The referenced surface elevation is 6,207', KB 6,237'.

2. Estimated Depth of Potential Water, Oil, Gas, & Other Mineral Bearing Formations

Formation	Substance	Depth Unit, ft
Fruitland Sands/Coal	Gas/Water/Coal-bed Methane	2092
Pictured Cliffs	Gas	2737
Mesaverde Group (all 3 formations, Cliff House, Menefee and Pt. Lookout)	Gas/Water	4334
Mancos	Gas/Minor Oil	5277

Gallup Ss	Gas/Minor Oil/Water	6424
Dakota Ss	Gas/Minor Oil/Water	7233
Morrison Ss	Water	7420
Entrada Ss	Oil/Water	8200

All shows of fresh water and minerals will be reported and protected.

3. Pressure Control

a) Pressure control equipment and configuration will be designed to meet 5M standards.

b) Working pressure on rams and BOPE will be 5000 psi

c) Function test and visual inspection of BOP will be conducted daily and noted in the IADC Daily Drilling Report.

d) The Annular BOP will be pressure tested to a minimum of 50 percent of its rated working pressure.

e) Blind and Pipe Rams/BOP will be tested against a test plug to 100 percentage of rated working pressure.

f) Pressure tests are required before drilling out from under all casing strings set and cemented in place.

g) BOP controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned.

h) BOP testing procedures and testing frequency will conform to Onshore Order No. 2.

i) BOP remote controls shall be located on the rig floor at a location readily accessible to the driller. Master controls shall be on the ground at the accumulator and shall have the capability to function all preventers.

j) The kill line shall be 2-inch minimum and contain two kill line valves, one of which shall be a check valve.

k) The choke line shall be a 2-inch minimum and contain two choke line valves (2-inch minimum).

l) The choke line shall be 2-inch minimum and contain two adjustable chokes

m) Hand wheels shall be installed on all ram preventers.

n) Safety valves and wrenches (with subs for drill string connections) shall be available on the rig floor at all times.

o) Inside BOP or float sub shall also be available on the rig floor at all times.

4. CASING & CEMENTING PROGRAM

The proposed casing and cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use. The casing setting depth shall be calculated to position the casing seat opposite a competent formation which will contain the maximum pressure to which it will be exposed during normal drilling operations. All indications of useable water shall be reported.

a) The proposed casing design is as follows:

Casing /Tubing String	Casing /tubing Depth, TVD[1], ft	Casing /Tubing Depth, MD[2], ft	Borehole Diameter, in.	Casing /Tubing Outside Diameter, in	Coupling Outside Diameter, in.	Casing/Tubing Material (Weight /Grade /Connection)	String Weight in Air, lb
Conductor	0-100	0-100	30	20	20	94 lb/ft, J-55, Welded	9,400
Surface	0-1,500	0-1,500	17 1/2	13 3/8	14.375	54.5 lb/ft, J-55, BTC	81,750
Intermed.	0-5,500	0-5,500	12 1/4	9 5/8	10.625	40 lb/ft, L-80, BTC	220,000
Long String	0-5,000	0-5,000	8 3/4	5 1/2	6.05	23 lb/ft, L80, BTC	115,000
	5,000-8,800	5,000-8,800	8 3/4	5 1/2	6.05	23 lb/ft, Cr13-P110, Premium BTC	87,400

Casing /Tubing String	Casing /Tubing Material (Weight /Grade /Connection)	Casing /Tubing Diameters (Outside /Inside / Drift Diameter), in.	Yield, ksi	Tensile, ksi	Internal (Burst) Yield, psi	Collapse, psi	Body Yield, 1000 lbs	Joint Strength 1000 lbs
Conductor	94 lb/ft, J-55, Welded	20/19/-	55	75	1530	520	1480	1402
Surface	54.5 lb/ft, J-55, BTC	13.375 /12.615 /12.459	55	75	2730	1130	853	909
Intermed.	40 lb/ft, L-80, BTC	9.625 /8.835 /8.679	80	95	5750	3090	916	947
Long String	23 lb/ft, L80, BTC	5.5 /4.67 /4.545	80	95	8990	11160	530	550
	23 lb/ft, Cr13-P110, Premium BTC	5.5 /4.67/ 4.545	110	125	12360	14540	729	724

Casing design is subject to revision based on geologic conditions encountered.

All casing strings below the conductor shall be pressure tested to 0.22 psi per foot of casing string length or 1,500 psi, whichever is greater, but not to exceed 70 percent of the minimum internal yield. If pressure declines more than 10 percent in 30 minutes, corrective action shall be taken.

b) The proposed cementing program is as follows:

Casing	Depth	Cement Volume, sacks	Cement Type &Yield	Designed TOC	Centralizers
Conductor	100	127	Type I Neat 14.8 ppg	Surface	None
Surface	1500	1216	Type III Cement+ 1% CaCl + 0.25lblsk Cello Flake + 0.2% FL, 14.6ppg, 1.38cuft/sk	Surface	1 per joint on bottom 3 joints
Intermediate	5500	50% open hole excess Stage 1 Lead: 544 sks Tail: 226 sks Stage 2 Lead: 422 sks Tail: 237 sks	Lead (Stages 1 and 2): Type III + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1 ppg 2.13cuft/sk Tail (Stage 1): Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuft/sk	Surface	1 per joint for bottom 3 joints, 1 on every 3 joints for remaining joints
Production	8800	75% open hole excess Lead: 864 sks Tail: 1258 sks	Lead: Class G cmt + 0.04 gal/sk antifoam +0.30 % Dispersant + 0.50 % Retarder, Evercrete cement, 16.1ppg, 1.07 cuft/sk	Surface	3 per joint

Top plugs shall be used to reduce contamination of cement by displacement fluid. A bottom plug or other acceptable technique, such as a pre-flush fluid, inner string cement method, etc. shall be utilized to help isolate the cement from contamination by the mud fluid being displaced ahead of the cement slurry.

Actual volumes will be calculated and determined by conditions onsite. All cement slurries will meet or exceed minimum BLM and New Mexico Oil Conservation Division requirements. Slurries used will be the slurries listed above or equivalent slurries depending on service provider selected. Cement yields may change depending on slurries selected.

All waiting on cement times shall be a minimum of 8 hours or adequate to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

5. DRILLING FLUIDS PROGRAM

Hole Size, in	Drilling Fluid System	Measured Depth, ft	Fluid Density, ppg	Plastic Viscosity, cp	Yield Point, lb /100ft^2	API Fluid loss, cm^3	PH	Circulation Rate, GPM
17 1/2	Water-based Mud	0–1,500	8.3-9.2	9-14	1-10	1-10	9-10	500
12 1/4	Water-based Mud	1,500-5,500	8.4-8.6	9-14	1-10	1-10	9-10	500
8 3/4	Water-based Mud	5,000-8,800	8.5	9-14	1-10	1-10	9-10	500

**Mud program may change based on mud engineer's field recommendation.*

There will be sufficient mud on location to control a blowout should one occur. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals, including fresh water and oil-based operations. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed by the service from company. The location will be lined in accordance with the Surface Use Plan of Operations.

6. TESTING, CORING and LOGGING

a) Drill Stem Testing -None anticipated

b) Coring program

The coring will cover the contiguous intervals from 7,410' to 8,346' in order to cover the following coring intervals for research purposes.

Coring interval #1	Look if there is enough of a seal between the lower reservoir units (Salt Wash, Bluff, and Entrada) and the Dakota Ss. (a gas producer in the area).	7,410'-7,530'
Coring interval #2	Look at both the transition between these two members of the Morrison and the lower Brushy Basin's sealing characteristics.	7,621'-7,691'
Coring interval #3	Collect cores in Salt Wash and Bluff formation, cap rock, and underlying formation. Also Collect cores in Entrada formation, cap rock, and underlying formation.	7,866'-8,346'

c) Mud Logging -Mud loggers will be on location from kick off point to TD.

d) Logging -See Below

Well Logging	Logging Program	Depth Intervals
	Surface Casing	
Measurements While Drilling	Near Bit Gamma Ray (GR) and Annular Pressure while drilling (APWD)	1,500'-0'
Open Hole	Triple combo (Resistivity, Density, Neutron, Gamma Ray [GR], Caliper[CALI], and Spontaneous Potential [SP])	1,500'-0'
Cased Hole	Cement bond log [CBL/VDL/CCL], Radial (Azimuthal) cement evaluation, Flexural wave imaging, temperature	1,500'-0'
	Intermediate Casing	
Measurements While Drilling	Near Bit Gamma Ray (Gr) and Annular Pressure while drilling (APWD)	5,500'-1,500'
Open Hole	Triple combo (Resistivity, Density, Neutron, Gamma Ray, Caliper, SP), Dipole sonic, Formation Imager - FMI	5,500'-1,500'
Cased Hole	Cement bond log [CBL/VDL/CCL], Radial (Azimuthal) cement evaluation, Flexural wave imaging, temperature	5,500'-1,500'
	Production Casing	
Measurements While Drilling	Near Bit Gamma Ray (GR) and Annular Pressure while drilling (APWD)	8,800'-5,500'
Open Hole	Triple combo (Resistivity, Density, Neutron, Gamma Ray [GR], caliper, and spontaneous potential [SP]) Dipole Sonic, including long recording times to see reflections from fractures and faults, Formation Imager - FMI, Litho Scanner with Spectral Gamma Ray, Magnetic Resonance Scanner, Dielectric Scanner, Formation Fluid Samples of porous zones, Sidewall Coring	8,800'-5,500' 8,800'-5,500'
Cased Hole	Cement bond log [CBL/VDL/CCL], Radial (Azimuthal) cement evaluation, Flexural wave imaging, temperature, Cased Hole Nuclear Spectroscopy, Casing Inspection Log, Zero Offset Vertical Seismic Profile	8,800'-5,000'

7. ABNORMAL PRESSURES & HYDROGEN SULFIDE

The anticipated bottom hole pressure is +/-3,300 psi. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H_2S is encountered, the guidelines in Onshore Order No. 6 will be followed.

8. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on November 30, 2021. It is anticipated that completion operations will begin within 60 days after the well has been drilled depending on coring and logging schedules with various service companies.

It is anticipated that the drilling of this well will take approximately 31 days.

New Mexico Institute of Mining and Technology

CarbonSAFE Project

Strat Well Injection Design Report

1. Lithology - Pore and Fracture Pressure

The pore and fracture pressure of the interested area are provided by Tom Bratton and shown in Fig. 1.

Depth, ft	Formation
0.00	
1,173.00	Kirkland
1,200.00	Kirkland
2,203.00	Fluitland
2,835.00	Lewis Shale
4,235.00	Cliffhouse
4,940.00	Pt. Lookout
5,215.00	Mancos Shale
5,500.00	Mancos Shale
6,262.00	Sallup
6,614.00	Lower Mancos Shale
7,115.00	Dakota
7,330.00	Morrison
7,814.00	Bluff
8,264.00	Todilto
8,303.00	Entrada
8,800.00	Chinle
9,000.00	Dechelly

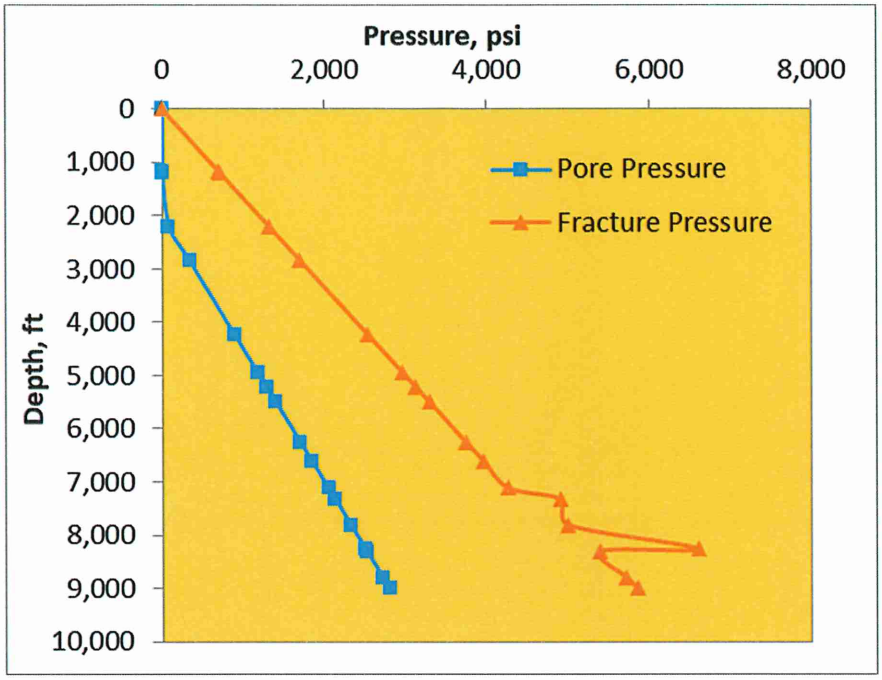


Figure 1: Pore and fracture pressure

2. Porosity and Permeability Data

The porosity and permeability data were given by Luke Martin for different formations. Due to the fact that the Bluff and Entrada formations are the two promising injection zones, this analysis will focus only on these two formations.

The porosity and permeability data for the Bluff and Entrada formation are plotted and shown in Fig. 2 and Fig. 3, respectively. Note that Fig. 2 and Fig. 3 show the original permeability and filtered permeability. We believed that the permeability values of the Bluff formation with the magnitude of more than 1000 mD are the outliers and hence we treated these values as the same values as the permeability of the formation right above it. Similarly, the permeability values of the Entrada formation with the magnitude of more than 100 mD are considered as outliers. We treated these values as the same values as the permeability of the formation right above it. The average permeability values of these two formations were then calculated. In addition, we considered the

maximum and minimum permeability values of these two formations for all of the simulations. The results are shown in Table 1.

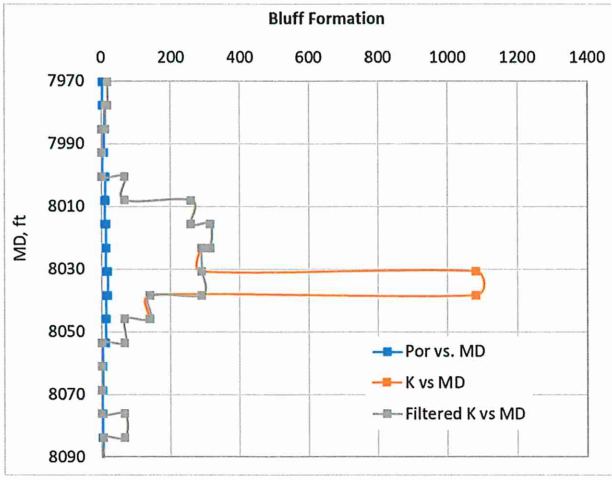


Figure 2: Porosity and permeability data of the Bluff formation

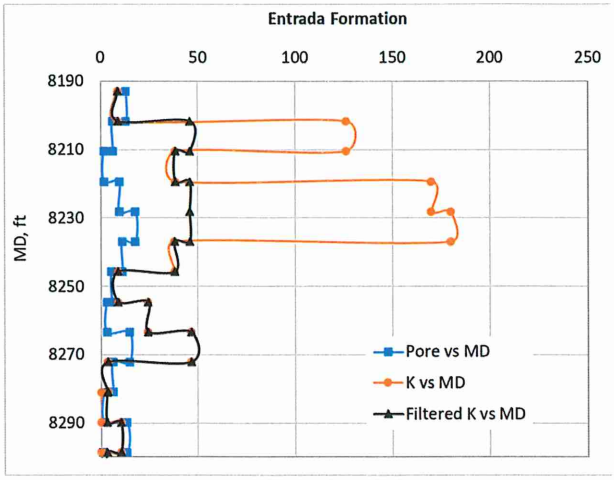


Figure 3: Porosity and permeability data of the Entrada formation

Table 1: Maximum, minimum, and average permeability values of the Bluff and Entrada

Formation type	Bottom MD, ft	Permeability, mD		
		Maximum	Average	Minimum
Bluff	8,094	288	95	0.39
Entrada	8,380	46	25	3

3. Injection Pressure Design

The surface injection pressure is calculated as follows

$$P_{inf} = BHP - P_h + \Delta P_f$$

Where P_{inj} is the surface injection pressure in psi; BHP is the bottomhole pressure in psi, and the ΔP_f is the frictional pressure losses in the production tubing in psi,

The BHP is calculated using the flowing equation in the reservoir with the following assumptions: 1-D radial flow, pseudo-steady state flow, and incompressible fluids.

The inputs for the simulations are presented in Table 2.

Table 2: Simulation input

Production Casing ID (5 ½ OD)	4.670	in
Production tubing ID (2 7/8 OD)	2.440	in
Reservoir area	125	acre
Reservoir radius	1316	ft
Bo	1.200	bbl/STB
Bluff formation Thickness of Bluff	1453.680	in
Bluff formation Permeability	0.393	mD
Skin factor	0.0	
Fluid viscosity	1.0	cp
Fluid density	8.5	ppg
Liquid injection rate	6000	BPD
Safety factor	500	psi

Using the maximum, average, and minimum permeability values for the Bluff and Entrada formations as shown in Table 1, the estimated BHP and the surface injection pressure for the Bluff and Entrada are shown in Table 3.

Table 3: BHP and injection pressure prediction

				Maximum Permeability			Average Permeability			Minimum Permeability		
	MD, ft	Pore, psi	Frac, psi	K, mD	BHP, psi	P_inj, psi	K, mD	BHP, psi	P_inj, psi	K, mD	BHP, psi	P_inj, psi
Bluff	8,094	2,325	5,000	289	2,560	51	95	3,035	526	0.39	174,472	171,963
Entrada	8,380	2,521	5,396	46	4,079	1,463	24	5,415	2,800	3.00	26,408	23,793

If the average permeability values (Bluff K = 95 mD and the Entrada K = 24 mD) are used, the estimated BHP are predicted as 3,035 psi and 5,415 psi for the Bluff and for the Entrada, respectively. Note that the BHP at the Entrada is 5,415 psi which is a little bit higher than the formation fracture pressure. Therefore, one can conclude that the liquid injection rate of 6,000 BPD is the upper limit. Above this rate, the formation will be fracture.

If the minimum permeability values are used, the BHP and the injection pressure are unrealistic. With the liquid rate of 6,000 BPD, the permeability of the Bluff and Entrada must be 26 mD and 30 mD or higher, respectively, to ensure the BHP less than the fracture pressure and to avoid the formation fracturing.

To be more practical, the minimum permeability simulations will not be discussed further in this report. The estimated BHP and injection pressure for the Bluff and Entrada for the two cases: maximum permeability and average permeability are shown in Fig. 4. One can easily recognize that the Bluff formation is much better quality for injection in comparison to the Entrada formation. At the injection rate of 6,000 BPD, the BHP and the injection pressure when Bluff (average K = 95 mD) is the injection formation are 3,035 psi and 525 psi, respectively. At the same rate, the

BHP and the injection pressure when Entrada (average K = 24 mD) is the injection formation are 5,415 psi and 2,800 psi, respectively.

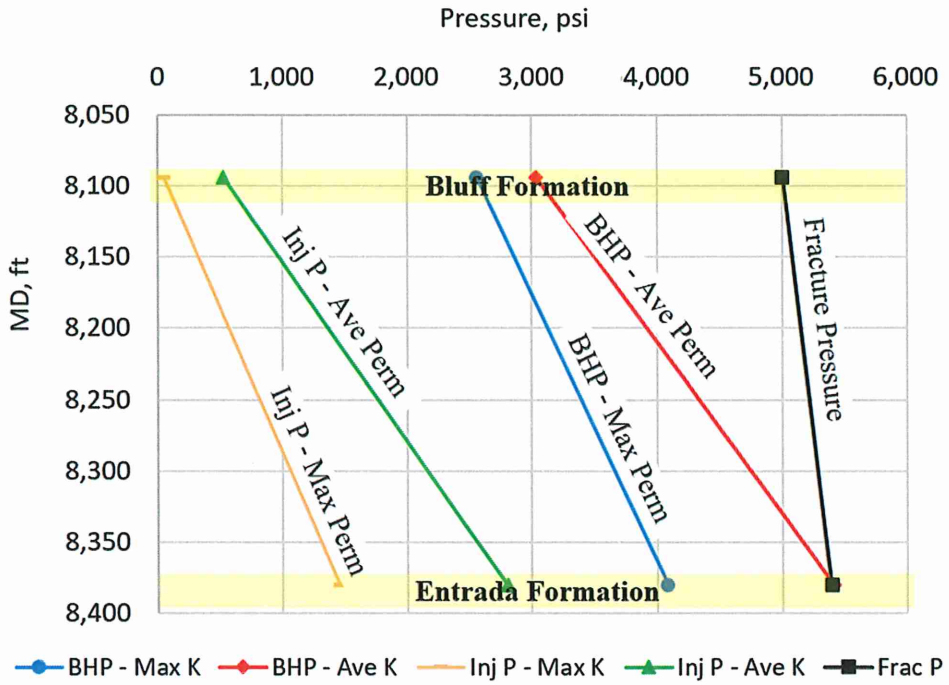
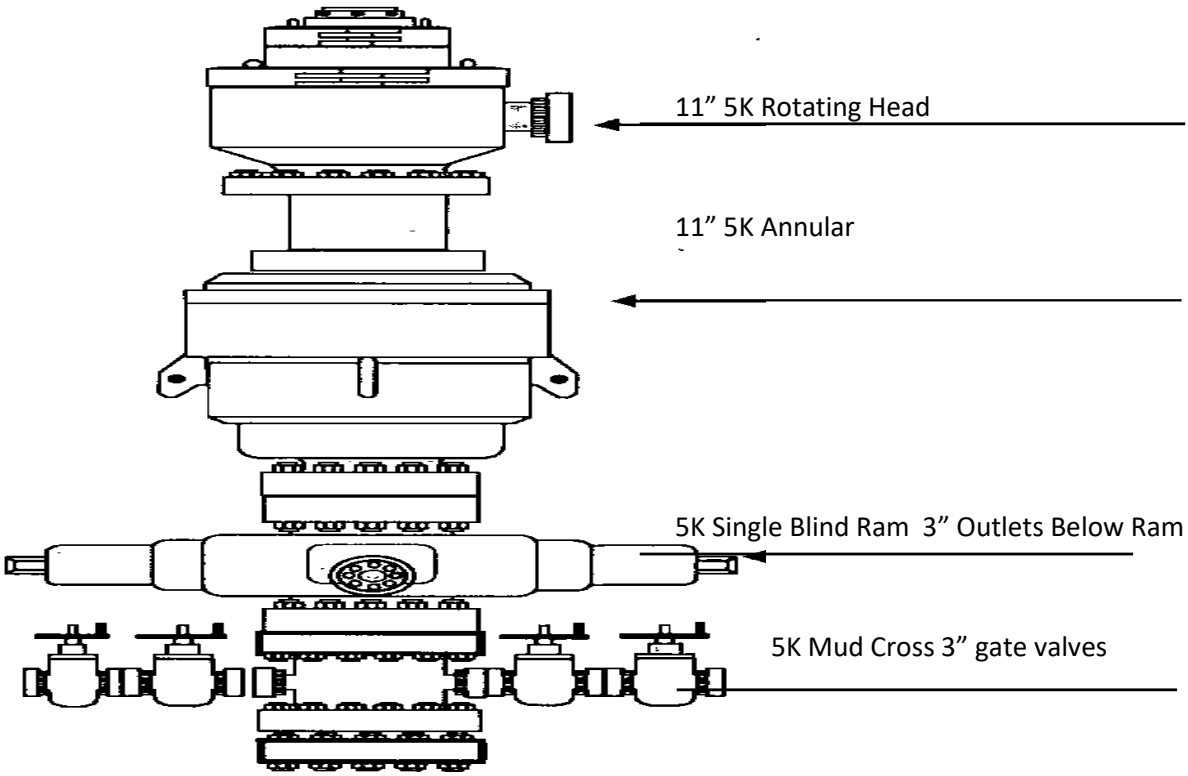
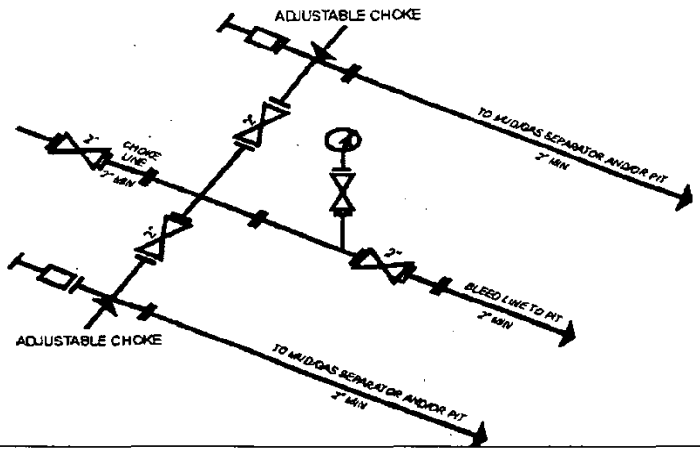


Figure 4: BHP and injection pressure for the maximum and average permeability cases

4. Summary

- Bluff is the much better candidate to be used as an injection formation compared to the Entrada.
- If the average permeability of the Bluff (K = 95 mD) is used, the maximum liquid rate can be injected is 17,500 BPD. This rate will create a BHP of 4,396 psi which is less than the formation fracture pressure and the surface injection pressure of about 5,000 psi which is the pressure rating for most of the surface equipment.
- If the average permeability of the Entrada (K = 24 mD) is used, the maximum liquid rate can be injected is about 6,000 BPD. This rate will create a BHP of about 5,300 psi which is very close to the formation fracture pressure.
- If the liquid injection rate is 6,000 psi, the minimum permeability values of the Bluff and the Entrada are 26 mD and 30 mD to avoid formation fracture.


11” 5K Rotating Head
11” 5K Annular
5K Single Blind Ram 3” Outlets Below Ram
5K Mud Cross 3” gate valves


ADJUSTABLE CHOKE
TO MUDGAS SEPARATOR AND/OR PIT
3" MIN
CHOKE LINE
3" MIN
BLEED LINE TO PIT
3" MIN
ADJUSTABLE CHOKE
TO MUDGAS SEPARATOR AND/OR PIT
3" MIN

P&A Procedure

San Juan Basin CarbonSAFE Facility

-108.061174 and 36.899774., Section 12, T31N, R12W

San Juan County, New Mexico

Plug & Abandonment Procedure:

Note: The lower section of the well (Plug #1) will be plugged using CO2 resistant cement from TD around 8800 ft to around 1000ft above the top of the Mancos Sh. formation (to approximately 4300 ft). Stabilizing wellbore fluid will be 13.2 ppg, sufficient to balance all exposed formation pressures. The yield of the cement will be 1.69 ft^3/sk or equivalent. The upper section of the well (Plug #2) will be plugged using class G cement from around 4300ft to the surface. Stabilizing wellbore fluid will be 12.5 ppg, sufficient to balance all exposed formation pressures. The cement will be ASTM Class G neat 1.72 ft^3/sk or equivalent.

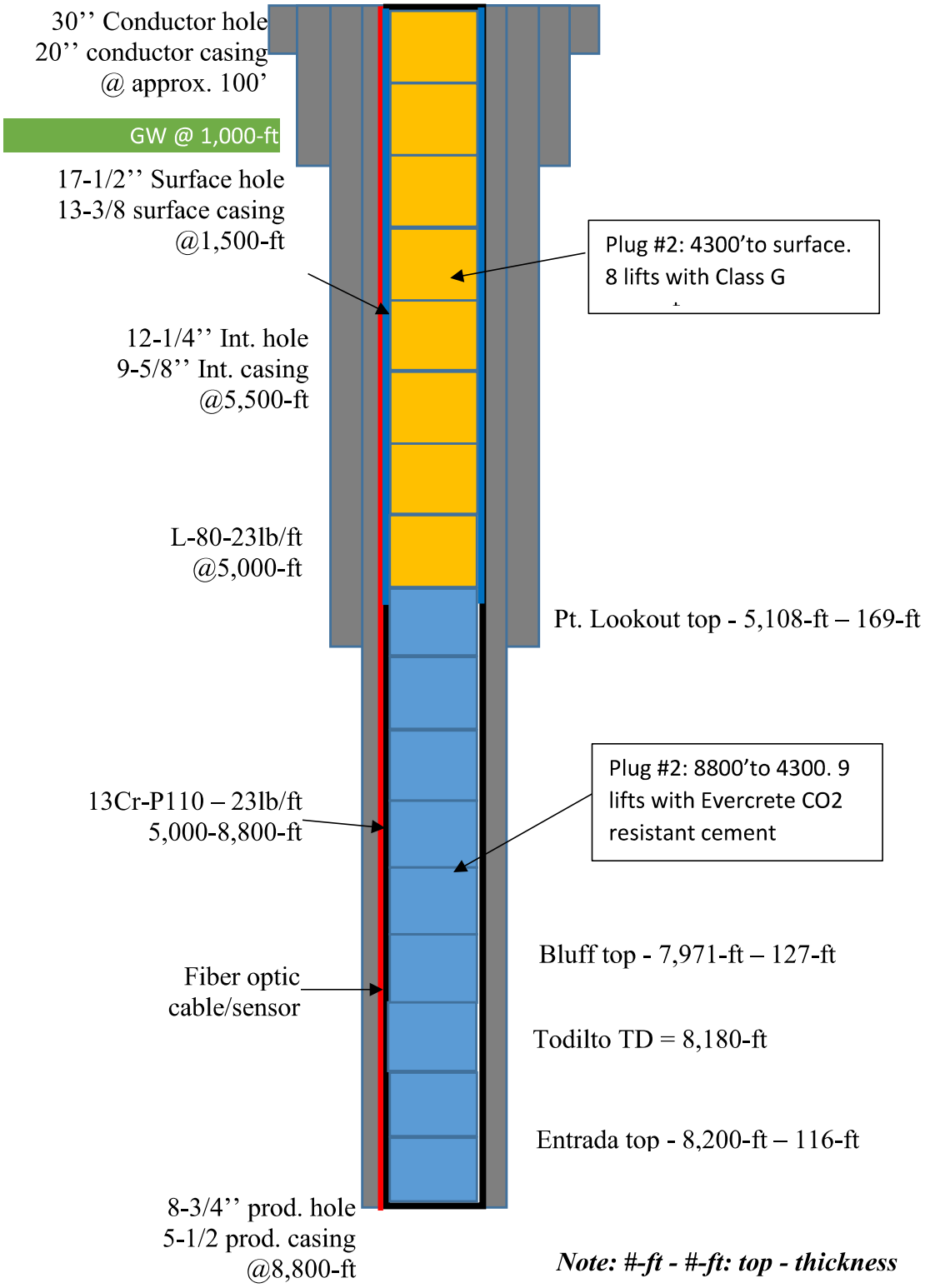
If casing pressure tests tagging plugs will not be required. Cement circulated on surface and production casing.

Prior to Mobilization

1. Notify BLM & NMOCD
2. Verify all cement volumes based on actual slurry to be pumped. Calculations based on 1.69 ft^3/sk for plug #1 and 1.72 ft^3/sk for plug #2.
3. Comply with all COA's from BLM and NMOCD

P&A Procedure

1. MIRU PU and cement equipment
2. ND WH, NU BOP, RU rig floor and 2 7/8" handling tools
3. POOH 2 7/8" production string set at ~8200'.
4. TIH with 5 ½" casing scraper to 8210'. TOOH LD 5 ½" scraper.
5. TIH with CICR and set @ 8100'. Roll hole with fresh water. PT tubing to 500 psi. PT casing to 2500 psi.
6. **Plug #1, 4300'- 8800' (Mancos Shale Top: 3012', Entrada Top 8192', Chinle Top 8528'):** Sting out of retainer. Mix & pump Evercrete CO2 resistant cement (or equivalent) of cement on top of retainer. It is anticipated that at least 9 lifts of 500 feet in length will be necessary (approximately 162 sacks Class g mixed at 13.2 ppg with yield 1.69 cu ft/sk). PU 200' above TOC and reverse circulate tubing clean. WOC if necessary.
7. **Plug #2, (4300' to Surface):** Mix and spot 500 ft balanced plug in 5 1/2 inch casing (approximately 157 sacks Class g mixed at 12.5 ppg with yield 1.72 cu ft/sk). Pull out of plug and reverse circulate tubing. Repeat this operation until a total of 8 lifts have been set.
8. ND BOP and cut off wellhead below surface casing flange, top off casing and annulus as necessary. Install P&A marker and cut off and/or remove anchors. RD, MOL - Restore location per BLM stipulations. Take pictures from all cardinal directions. Ensure to notify project management of all remaining equipment on location once plugging is complete.


30'' Conductor hole
20'' conductor casing
@ approx. 100'
GW @ 1,000-ft
17-1/2'' Surface hole
13-3/8 surface casing
@1,500-ft
Plug #2: 4300'to surface.
8 lifts with Class G
12-1/4'' Int. hole
9-5/8'' Int. casing
@5,500-ft
L-80-23lb/ft
@5,000-ft
Pt. Lookout top - 5,108-ft – 169-ft
Plug #2: 8800'to 4300. 9
lifts with Evercrete CO2
resistant cement
13Cr-P110 – 23lb/ft
5,000-8,800-ft
Bluff top - 7,971-ft – 127-ft
Fiber optic
cable/sensor
Todilto TD = 8,180-ft
Entrada top - 8,200-ft – 116-ft
8-3/4'' prod. hole
5-1/2 prod. casing
@8,800-ft
Note: #-ft - #-ft: top - thickness

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1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
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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
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State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

COMMENTS

Action 75551

COMMENTS

Operator: NEW MEXICO INSTITUTE OF MINING & TECHNOLOGY 801 Leroy Pl Socorro, NM 87801	OGRID: 15847
	Action Number: 75551
	Action Type: [C-101] Drilling Non-Federal/Indian (APD)

COMMENTS

Created By	Comment	Comment Date
kpickford	SWD-2462	2/10/2022

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CONDITIONS

Created By	Condition	Condition Date
kpickford	Notify OCD 24 hours prior to casing & cement	2/9/2022
kpickford	5 1/2" production casing must go to 8,800' deep.	2/9/2022
kpickford	Operator shall comply with UIC Permit SWD-2462 including the special conditions listed in Section II.	2/10/2022
kpickford	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string	2/10/2022
kpickford	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system	2/10/2022
kpickford	Although this APD includes a plugging plan, an NOI to P&A is required to be reviewed and approved at the time the operator is prepared to plug this well.	2/10/2022