Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV – (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

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

Form C-103
Revised July 18, 2013

WELL API NO. 30-015-42356

5. Indicate Type of Lease STATE [X] FEE [ ]

6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name: Cottonwood 2 State SWD

1. Type of Well: Oil Well [ ] Gas Well [ ] Other SWD

8. Well Number 1

2. Name of Operator: Solaris Water Midstream, LLC

9. OGRID Number: 371643

3. Address of Operator: 9651 Katy Freeway, Suite 400, Houston, TX 77024

10. Pool name or Wildcat: SWD; Devonian

4. Well Location
Unit Letter O : 400 feet from the South line and 1400 feet from the East line
Section 2 Township 26 S Range 26 E NMPM County Eddy

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)*
3,963.5' GR

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	[ ]	PLUG AND ABANDON	[ ]	REMEDIAL WORK	[X]	ALTERING CASING	[ ]
TEMPORARILY ABANDON	[ ]	CHANGE PLANS	[ ]	COMMENCE DRILLING OPNS.	[ ]	P AND A	[ ]
PULL OR ALTER CASING	[ ]	MULTIPLE COMPL	[ ]	CASING/CEMENT JOB	[ ]		
DOWNHOLE COMMINGLE	[ ]						
CLOSED-LOOP SYSTEM	[ ]						
OTHER:	[ ]			OTHER:			[ ]

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

Solaris Water Midstream has completed the workover on the above captioned well, finished with a successful bradenhead and MIT test on 09.24.2024. As per the originally approved workover NOI, a drilling rig with hydraulic BOPs was rigged up and the existing injection tubing was pulled out of the hole, including the retrievable AS1-X packer.

A more detailed summary is in the attached work plan.

Spud Date: 07/12/2014 Rig Release Date: 09/18/2014

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Lauren N. Bean TITLE Sr. Engineering Tech DATE 09/26/2024

Type or print name Lauren N. Bean E-mail address: lauren.bean@ariswater.com PHONE: 281-732-8785

For State Use Only

APPROVED BY: _____ TITLE _____ DATE _____
Conditions of Approval (if any):

compass Cementing

Date	9/1/2024		Bill To:	Solaris	
Ticket Number	11412060	Cementer:			
Location	Midland	Balente Gonzales			

Company	Solaris		**Well Name**	Cottonwood 2 State SWD 1	
County	Eddy	**State**	New Mexico	**Rig**	Workover
Job Type	Squeeze	**Casing Size**	7	**Casing Depth**	

Description	Quantity	Unit Cost	Units	Gross Amount	Net Amount
Pump Charge 0' to 1000'	1	$3,020.00	EA	$3,020.00	$1,359.00
Pump Charge - Additional Hours	0	$2,250.00	HR	$0.00	$0.00
HV Mileage	200	$13.75	MI	$2,750.00	$1,237.50
LV Mileage	200	$8.13	MI	$1,626.00	$731.70
Data Acquisition	1	$1,305.00	EA	$1,305.00	$587.25
Thickening Time Test, Field Blend	1	$2,485.00	EA	$2,485.00	$1,118.25
Diesel Fuel Surcharge	1	$1,090.00	EA	$1,090.00	$490.50
Squeeze Manifold	1	$1,325.00	EA	$1,325.00	$596.25
Tubing Swage	0	$415.00	EA	$0.00	$0.00
Subtotal for Pumping & Equipment Charges				$13,601.00	$6,120.45
Compass Poz-Mix	120	$33.95	SACKS	$4,074.00	$1,833.30
Class C Premium	180	$61.10	SACKS	$10,998.00	$4,949.10
Calcium Chloride	516	$2.68	LB	$1,382.88	$622.30
C-51 Suspension Agent	8	$48.55	LB	$388.40	$174.78
Magnesium Oxide	1,290	$5.02	LB	$6,475.80	$2,914.11
CFL-1	104	$72.81	LB	$7,572.24	$3,407.51

Solaris Water Midstream

Well/Pipeline Cotton Wood 2 ST SWD #1

AFE# Project # EXP 20240810O

GL Account# 1655 Date: 9-1-24

SOLARIS Rep: MOD

DFL-1	5	$159.42	GA	$797.10	$358.70
Sugar	300	6.45	LB	$1,935.00	$870.75
Materials Handling	333	4.35	CF	$1,448.55	$651.85
Drayage	60,000	0.10	SK x MI	$6,240.00	$2,808.00
Subtotal for Materials Charges				$41,311.97	$18,590.39
Gross Price Subtotal					$54,912.97
Discount				55.0%	($30,202.13)
Pre-tax Total					**$24,710.84**

Service Receipt: I certify that the materials and services listed were received and all services performed in a workmanlike manner.

Company Rep: _____

Printed: _____

COMPASS JOB LOG

Solaris	Cottonwood 2 State SWD 1	Squeeze	Ticket Number	11412060

Date	Time	PRESSURES PSI		FLUID PUMPED DATA				RETURNS	REMARKS
		DRILL PIPE/ CASING	ANNULUS	TOTAL STAGE VOLUME	VOLUME PUMPED	RATE (BBLS MIN.)	FLUID TYPE	WELL RETURNS (F, P, NR)	
09/01/24	4:00								Cement Crew Was Called Out
	5:30								Cement Crew Left Compass Yard
	8:30								Cement Crew Arrived On Location
	9:00								Hazard Assesment/Spot Trucks
	9:15								Pre-Rig Up Safety Meeting/Rig Up
	9:55								Rig Up Completed
									Job Information:
									Casing: 7" Weight: 29# Grade: P-110
									Previous Casing: 9.625" Weight: 43.5# Grade: P-110
									Water Test: Chlorides-500 Sulfates-200 PH-6 Iron- 5 Temp- 75
	10:10								Pre-Job Safety Meeting
	10:15	5		1	1	2	H2O	NR	Prime Lines With Fresh Water
	10:19	750		1	1	1	H2O	NR	Test Lines
	10:21	160		6.5	6.5	4	H2O	NR	Break Circulation And Pump 6 bbls Of Fresh Water
	10:25	100		15	15	4	Cement	F	Pumped 15 bbls Of Cement/Took 4 bbls To Get Cement To Surface
	10:32								Shutdown/Wash Up
	10:47	50		1	1	1	H2O		Displaced 1 bbl of Fresh Water Down 7" Casing
	10:48								Shutdown
	10:50	100							Closed In Well With 100 PSI
	11:00								Pre-Rig Down Safety Meeting
	11:50								Departure
									6 x 5-110 4 x 4- 40

CEMENTING SUMMARY

Company	Solaris	**Lease and Well Number**	Cottonwood 2 State SWD 1		
Type Job	Squeeze	**Bid Prepared By**	Joseph Keller	**Ticket Number**	11412060

JOB TYPE ☐ Intermediate ☐ Liner ☐ Production ☐ PTA ☑ Squeeze ☐ Surface

CASING DATA

Size	Depth	Grade	Weight	Bbl/Ft Factor	Cuft/Ft Factor	Maximum Pressure
7"		P-110	29#	0.0371	0.2086	
9.625"		P-110	43.5#	0.0745	0.4181	

DRILL PIPE / TUBING DATA

Size	Depth	Grade	Weight	Bbl/Ft Factor	Cuft/Ft Factor	Maximum Pressure

OPEN HOLE DATA

Size	Depth	Excess %	Bbl/Ft Factor	Cuft/Ft Factor

OPEN HOLE ANNULUS DATA

Size	Depth	Excess %	Bbl/Ft Factor	Cuft/Ft Factor	Maximum Pressure

PREVIOUS CASING ANNULUS DATA

Size	Depth	Grade	Weight	Bbl/Ft Factor	Cuft/Ft Factor	Maximum Pressure

MUD / SPACER / CEMENT DATA

MUD		SPACER		
Type	Density	Type	Density	Volume / BBLs
		Fresh Water	8.3	6.5
		Spacer 3		
		Spacer 3 additives		

JOB WATER REQUIREMENTS (BBLS)

Total Mix Water (Bbls)	9
Total Spacer Water (Bbls)	7
Total Disp Water (Bbls)	1
Total Wash Up Water (Bbls)	20
Total Additional Water (Bbls)	0
Safety Factor - 20%	7
Tank Bottoms	50
Total Water Required	**95**

CEMENT SLURRIES

Type	Sacks	Density	Yield cuft/sk	Gal/Sk	Excess %	Thickening Time
Primary Cement	300	14.50	1.32	6.10	0.0%	

*60%Class C Premium * 40%Compass Poz-Mix * 2%Calcium Chloride * 0.03%C-51 Suspension Agent * 5%Magnesium Oxide * 0.4%CFL-1 **

CASING / FLOATING EQUIPMENT

Type	Depth	Manufacturer	Type	Quantity	Manufacturer
Float Shoe			Centeralizers		
Float Collar			Top Plug		
Stage Tool(s)			Bottom Plug		
External Casing Packer			Foam Wiper Ball		
Liner Hanger					

DISPLACEMENT FLUID AND VOLUME

Disp. Fluid Type	Fresh Water	Volume (Bbls.)	1	Density (PPG)	8.33	
Disp. Fluid Type		Volume (Bbls.)		Density (PPG)		
Disp. Fluid Type		Volume (Bbls.)		Density (PPG)		

EQUIPMENT

Pump Truck Unit #	2186	Bulk 660 Unit #	2052	Bulk 1600 Unit #	Other	1192
Pump Truck Unit #		Bulk 660 Unit #		Bulk 1600 Unit #	Other	1190
Batch Mixer Unit #		Bulk 660 Unit #		Bulk 1600 Unit #	Other	
Pressurizer Unit #		Bulk 660 Unit #		Bulk 1600 Unit #	Other	

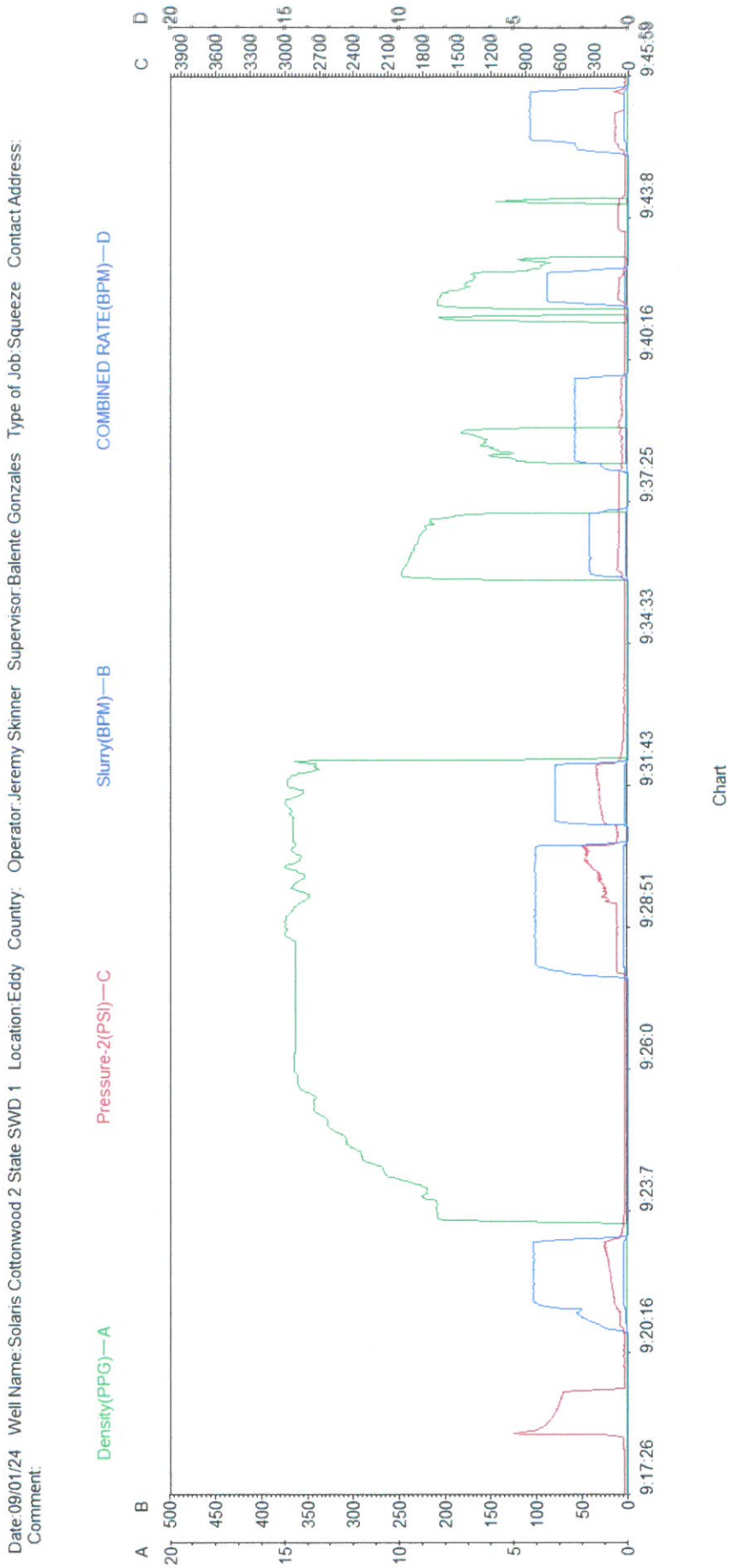
Employees

Employee #1	Jeremy Skinner	Employee #4	Balente Gonzales	Employee #7	
Employee #2	Armando Barraza	Employee #5		Employee #8	
Employee #3	Michael Fraley	Employee #6		Employee #9	

Date and Time Requested on Location:	9:00	09/01/24	**Date and Time Arrived on Location:**	8:30	09/01/24

COMPANY REPRESENTATIVE	NUMBER	**CEMENTER:**	Balente Gonzales

Date:09/01/24 Well Name:Solaris Cottonwood 2 State SWD 1 Location:Eddy Country: Operator:Jeremy Skinner Supervisor:Balente Gonzales Type of Job:Squeeze Contact Address:
Comment:



Chart

Field Test - Water Analysis Report

COMPANY:	Solaris	**Date Recorded**	9/1/2024
SUBMITTED BY:	Balente Gonzales	**SO#**	11412060
LEASE and WELL#:	Cottonwood 2 State SWD 1	**Job Type**	Squeeze
Test Kit Number:		**Camp Location**	Midland

CEMENT MIX WATER REQUIREMENTS

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	6	----	6.0 - 8.0	Chemicals in the water can cause severe acceleration or retardation
Chlorides	500	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	200	ppm	2000 ppm	Will greatly reduce Cement Compressive Strength
Iron	5	ppm	300 mg/L	Can reduce Cement Compressive Strength
Temperature	75	oF	40-100 °F	High temps will accelerate; Low temps may risk freezing in cold weather

compass Cementing

Date	9/4/2024		Bill To:	Solaris	
		Cementer:		Ticket Number	11412080
Location	Midland	ART MEDINA			

Company	Solaris		Well Name	Cottonwood 2 State SWD 1	
County	Eddy	State	New Mexico	Rig	Workover
Job Type	Squeeze	Casing Size	0	Casing Depth	50

W/S	Item Code	Description	Quantity	Unit Cost	Unit	Gross Amount	Net Amount
	10001-10	Pump Charge 0' to 1000'	1	$3,020.00	EA	$3,020.00	$ 1,359.00
	10024-10	Pump Charge - Additional Hours	0	$2,250.00	HR	$0.00	$ -
	30002-10	HV Mileage	200	$13.75	MI	$2,750.00	$ 1,237.50
	30001-10	LV Mileage	200	$8.13	MI	$1,626.00	$ 731.70
	10045-10	Data Acquisition	1	$1,305.00	EA	$1,305.00	$ 587.25
	10052-10	Thickening Time Test, Field Blend	1	$2,485.00	EA	$2,485.00	$ 1,118.25
	10031-10	Diesel Fuel Surcharge	1	$1,090.00	EA	$1,090.00	$ 490.50
	10090-10	Squeeze Manifold	1	$1,325.00	EA	$1,325.00	$ 596.25
	10061-10	Tubing Swage	0	$415.00	EA	$0.00	$ -
		Subtotal for Pumping & Equipment Charges				$13,601.00	$ 6,120.45
	20003-10	Compass Poz-Mix	128	$33.95	SACKS	$4,345.60	$ 1,955.52
	20010-10	Class C Premium	192	$61.10	SACKS	$11,731.20	$ 5,279.04
	21001-10	Calcium Chloride	551	$2.68	LB	$1,476.68	$ 664.51
	29013-10	C-51 Suspension Agent	9	$48.55	LB	$436.95	$ 196.63
	29036-10	Magnesium Oxide	1,376	$5.02	LB	$6,907.52	$ 3,108.38
	29059-10	CFL-1	111	$72.81	LB	$8,081.91	$ 3,636.86
	30003-10	Materials Handling	356	$4.35	CF	$1,548.60	$ 696.87
	30004-10	Drayage	160,000	$0.10	SK x MI	$16,640.00	$ 7,488.00
		Subtotal for Materials Charges				$51,168.46	$ 23,025.81
		Gross Price Subtotal					$ 64,769.46
		Discount				55.0%	$ (35,623.20)
		Credit for Unused 240 Sacks of Cement from Squeeze #1					$ (11,127.67)
		Pre-tax Total					$ 18,018.59

Solaris Water Midstream

Well/Pipeline Cotton Wood 2 ST SWD #1

AFE# Project # EXP20240800

GL Account# 1655 Date: 9-4-24

SOLARIS Rep: Michael Ortiz

Service Receipt: I certify that the materials and services listed were received and all services performed in a workmanlike manner.

Company Rep: _____

Printed: _____

COMPASS JOB LOG

Solaris | Cottonwood 2 State SWD 1 | Squeeze | Ticket Number 11412080

Date	Time	PRESSURES PSI		FLUID PUMPED DATA				RETURNS	REMARKS
		DRILL PIPE/ CASING	ANNULUS	TOTAL STAGE VOLUME	VOLUME PUMPED	RATE (BBLS MIN.)	FLUID TYPE	WELL RETURNS (F, P, NR)	
09/04/24	3:00								CREW CALLED OUT
	6:45								PRE CONVOY SAFEY MEETING
	7:00								CREW LOADED AND LEAVING YARD
	10:30								CREW ARRIVED ON LOCATION
	10:35								PRE RIG UP SAFETY MEETING WITH ALL CWS EMPLOYEES
	10:45								RIG UP ALL CWS EQUIPMENT
	11:30								GROUND RIG UP COMPLETE
									WELL INFORMATION:
									WELL FLUID- 8.33 ppg
									PREVIOUS CASING- 50' 13 3/8 J-55 54.5#
									CASING - 7" 29
									DISPLACEMENT- .06 BBLS
									PERFS AT 50'
									SAFETY MEETING WITH ALL CWS , SOLARIS MIDSTREAM EMPLOYEES
									RIG UP REMAINDER OF CWS EQUIPMENT
	8:45								PRESSURE TEST PUMPS AND LINES TO 1600 PSI
	8:53								RELEASE PRESSURE
	9:02	190		5	5	2	WATER	F	ESTABLISHED CIRCULATION/ BATCHED UP CEMENT
	9:04								SHUT DOWN
	9:09	190		5	5	2	PRIMARY	F	PUMPED 7 BBLS OF GOOD CEMENT TO FILL CASING AND BACKSIDE
	9:12								SHUTDOWN/ AND SHUT IN CASING
	9:13								OPENED THE BACKSIDE
	9:15	990		1.6	1.2	0.5	PRIMARY	NR	PUMPED 1.1 BBLS DOWN THE BRADENHEAD
	9:17								SHUT DOWN TO HESITATE
	9:23	1040			0.1	0.5	PRIMARY	NR	PUMPED 0.1 BBL DOWN THE BRADENHEAD
	9:24								SHUTDOWN TO HESITATE
	9:25	980			0.1	0.5	PRIMARY	NR	PUMPED 0.1 BBLS DOWN THE BRADENHEAD
	9:26								SHUTDOWN TO HESITATE
	9:50	1020			0.1	0.5	PRIMARY	NR	PUMPED 0.1 BBLS DOWN THE BRADENHEAD
	9:52								SHUTDOWN TO HESITATE
	10:29	1030			0.1	0.5	PRIMARY	NR	PUMPED 0.1 BBLS DOWN THE BRADENHEAD
	10:30								SHUTDOWN TO HESITATE
	10:36								WASHED PUMPS AND LINES TO PIT
	10:43	970		0.05		0.5	WATER	NR	PUMP DISPLACEMENT .05 BBLS DOWN THE BRADENHEAD
	10:44	1020			0.1	0.5	WATER	NR	PUMPED 0.1 BBLS DOWN THE BRADEN HEAD
	10:48	1500			0		WATER	NR	PUMPED 0 BBLS DOWN
	10:49	1500							SHUT IN WELL

CEMENTING SUMMARY

Company	Solaris	Lease and Well Number	Cottonwood 2 State SWD 1		
Type Job	Squeeze	Bid Prepared By	Billy Gideon	Ticket Number	11412080

JOB TYPE ☐ Intermediate ☐ Liner ☐ Production ☐ PTA ☑ Squeeze ☐ Surface

CASING DATA

Size	Depth	Grade	Weight	Bbl/Ft Factor	Cuft/Ft Factor	Maximum Pressure
7	50		29			

DRILL PIPE / TUBING DATA

Size	Depth	Grade	Weight	Bbl/Ft Factor	Cuft/Ft Factor	Maximum Pressure

OPEN HOLE DATA

Size	Depth	Excess %	Bbl/Ft Factor	Cuft/Ft Factor

OPEN HOLE ANNULUS DATA

Size	Depth	Excess %	Bbl/Ft Factor	Cuft/Ft Factor	Maximum Pressure

PREVIOUS CASING ANNULUS DATA

Size	Depth	Grade	Weight	Bbl/Ft Factor	Cuft/Ft Factor	Maximum Pressure
13 3/8	50	J-55	54.5			

MUD / SPACER / CEMENT DATA

MUD Type	MUD Density	SPACER Type	SPACER Density	SPACER Volume / BBLs
WATER	8.33			
		Spacer 3		
		Spacer 3 additives		

JOB WATER REQUIREMENTS (BBLS)

Total Mix Water (Bbls)	47
Total Spacer Water (Bbls)	0
Total Disp Water (Bbls)	1
Total Wash Up Water (Bbls)	20
Total Additional Water (Bbls)	0
Safety Factor - 20%	14
Tank Bottoms	50
Total Water Required	**132**

CEMENT SLURRIES

Type	Sacks	Density	Yield cuft/sk	Gal/Sk	Excess %	Thickening Time
Squeeze Cement	320	14.50	1.32	6.10	10.0%	

*60%Class C Premium * 40%Compass Poz-Mix * 2%Calcium Chloride * 0.03%C-51 Suspension Agent * 5%Magnesium Oxide * 0.4%CFL-1 **

CASING / FLOATING EQUIPMENT

Type	Depth	Manufacturer	Type	Quantity	Manufacturer
Float Shoe			Centeralizers		
Float Collar			Top Plug		
Stage Tool(s)			Bottom Plug		
External Casing Packer			Foam Wiper Ball		
Liner Hanger					

DISPLACEMENT FLUID AND VOLUME

Disp. Fluid Type	Fresh Water	Volume (Bbls.)	0.6	Density (PPG)	8.33
Disp. Fluid Type		Volume (Bbls.)		Density (PPG)	
Disp. Fluid Type		Volume (Bbls.)		Density (PPG)	

EQUIPMENT

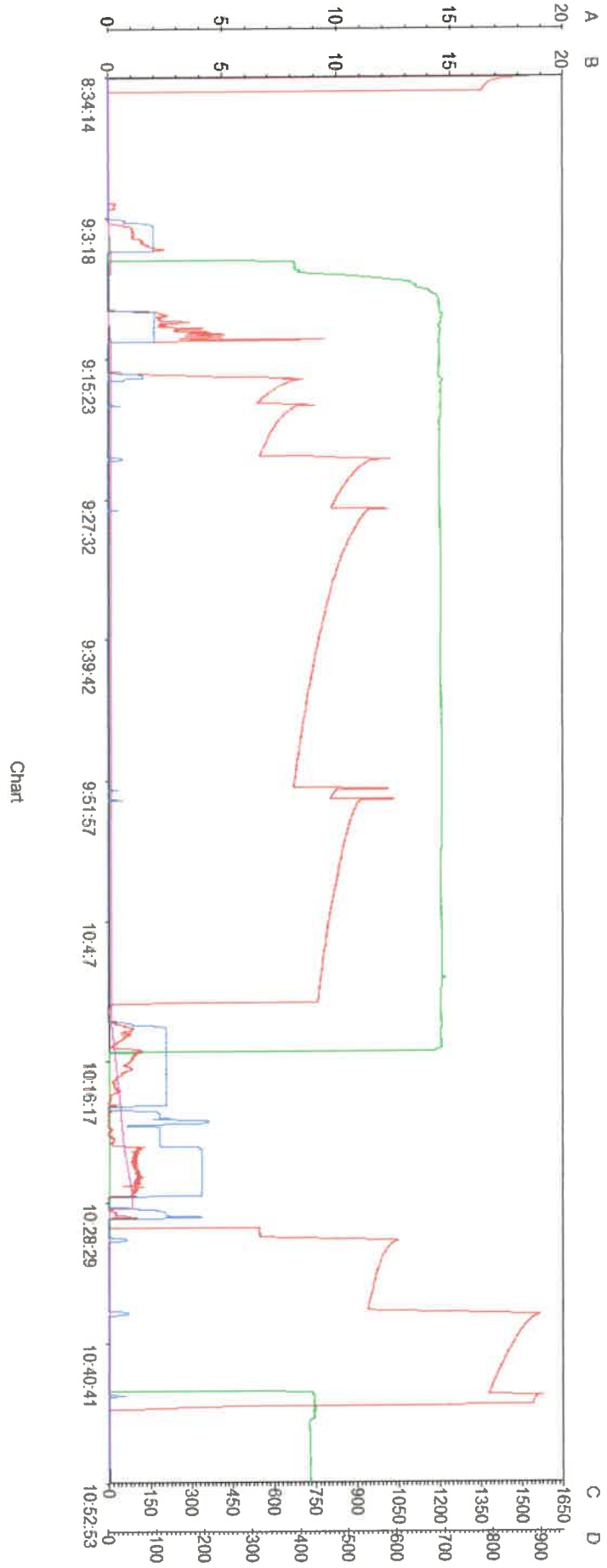
Pump Truck Unit #	2208	Bulk 660 Unit #	2052	Bulk 1600 Unit #	Other
Pump Truck Unit #		Bulk 660 Unit #		Bulk 1600 Unit #	Other
Batch Mixer Unit #		Bulk 660 Unit #		Bulk 1600 Unit #	Other
Pressurizer Unit #		Bulk 660 Unit #		Bulk 1600 Unit #	Other

Employees

Employee #1	ART MEDINA	Employee #4	MIKE FRALEY	Employee #7	
Employee #2	ERIC CHAVEZ	Employee #5		Employee #8	
Employee #3	CHRIS SOTO	Employee #6		Employee #9	

Date and Time Requested on Location:	8:00	09/04/24	**Date and Time Arrived on Location:**	7:00	09/04/24
COMPANY REPRESENTATIVE: MICHAEL			**CEMENTER:**	ART MEDINA	

Date:09/04/2024 Well Name:COTTONOWOOD 2 STATE SWD 1 Location:EDDY COUNTY, NM Country:USA Operator:ERIC CHAVEZ Supervisor:ART MEDINA Type of Job:SQUEEZE Contact Address: Comment:



Chart

compass Cementing

Field Test - Water Analysis Report

COMPANY: Solaris **Date Recorded** 9/4/2024

SUBMITTED BY: ART MEDINA **SO#** 11412080

LEASE and WELL#: Cottonwood 2 State SWD 1 **Job Type** Squeeze

Camp Location Midland

CEMENT MIX WATER REQUIREMENTS

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	7	----	6.0 - 8.0	Chemicals in the water can cause severe acceleration or retardation
Chlorides	500	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	800	ppm	2000 ppm	Will greatly reduce Cement Compressive Strength
Iron	0	ppm	300 mg/L	Can reduce Cement Compressive Strength
Temperature	69	oF	40-100 °F	High temps will accelerate; Low temps may risk freezing in cold weather

ENVENTURE

Post-Job Report

5.5 x 7 in. 29.0 lb/ft ESeal Liner- upper liner

Solaris Water LLC

Cottonwood 2 ST SWD Lower liner
Permian Basin
Eddy County, NM

September 6, 2024 – September 13, 2024

Prepared by	:	**Richard Breaux**
Mobile	:	**713-294-0091**
Office	:	**281-552-2200**
Fax	:	**281-552-2201**
E-mail	:	**richard.breaux@enventuregt.com**

Version: 1.0

Table of Contents

Purpose

To safely and successfully install a 5-1/2 in. x 7 in. 29 lb./ft. ESeal Liner. The liner will be used to cover up and isolate squeezed perforations in 7 in. 29 ppf casing at 2,250 ft MD. The ESeal Liner e set from ~2,185 ft MD (top of liner post expansion) to ~2,310 ft MD (bottom of liner post expansion). The exact setting depth will be determined on location after tallies have been completed and will be communicated and approved by the Solaris Water Engineer and Enventure's operations in office.

Scope

This process applies to all operations personnel of Enventure Global Technology, Inc. (EGT) and its global locations.

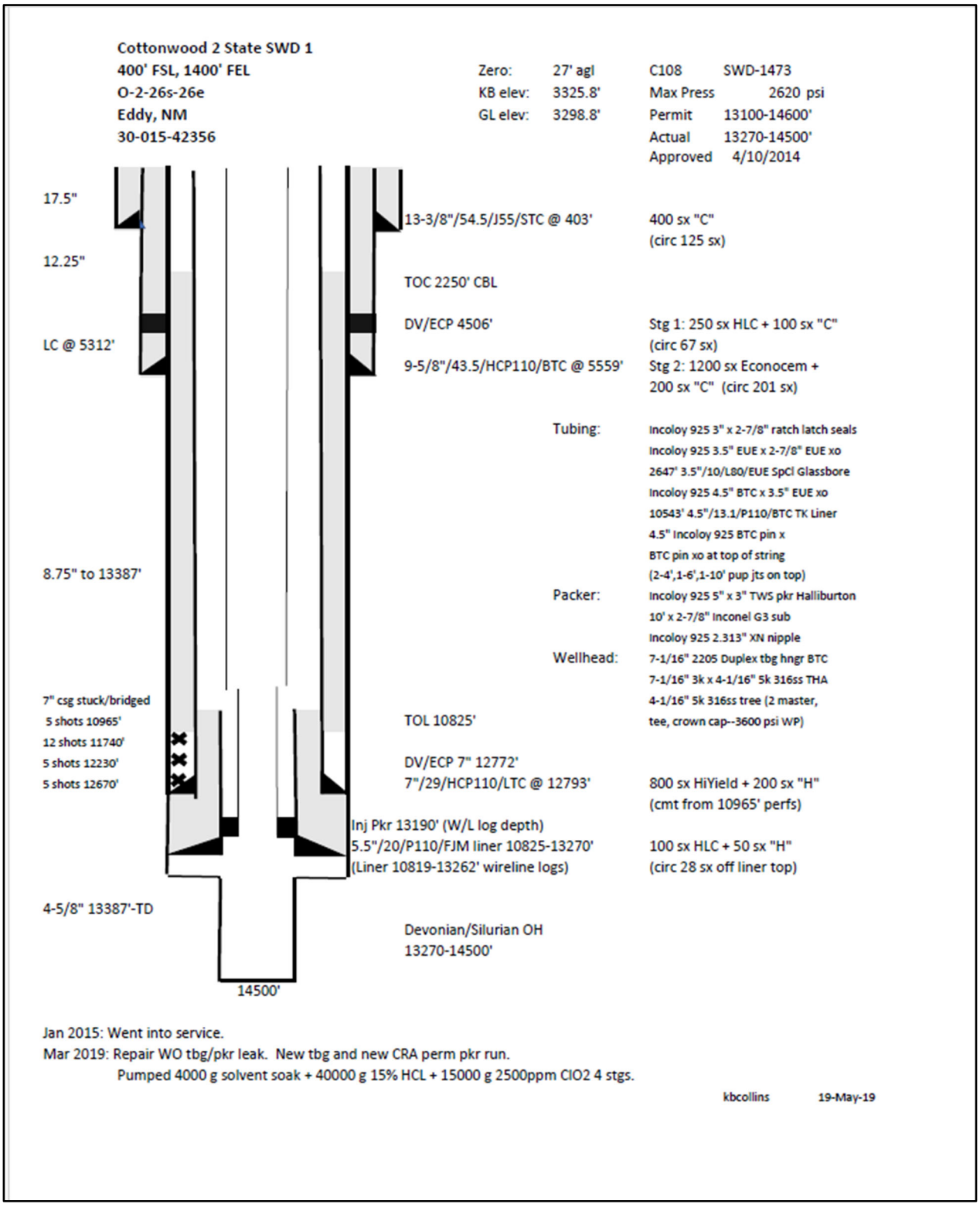
Responsibility

- **Operations Management -** Responsible for reviewing and ensuring training and implementation of this process for relevant operation installations
- **Operations / Project Managers -** Responsible for adjusting the generic installation procedures as applicable for relevant jobs, communicating the procedure internally and externally, and following the requirements during operations
- **Sales Manager –** Responsible for maintaining client relationships and dispersing customer information and requirements to relevant EGT stakeholders.
- **Engineering –** Provides technical support, such as but not limited to evaluation of customer technical information and development of EGT System Design Specifications.

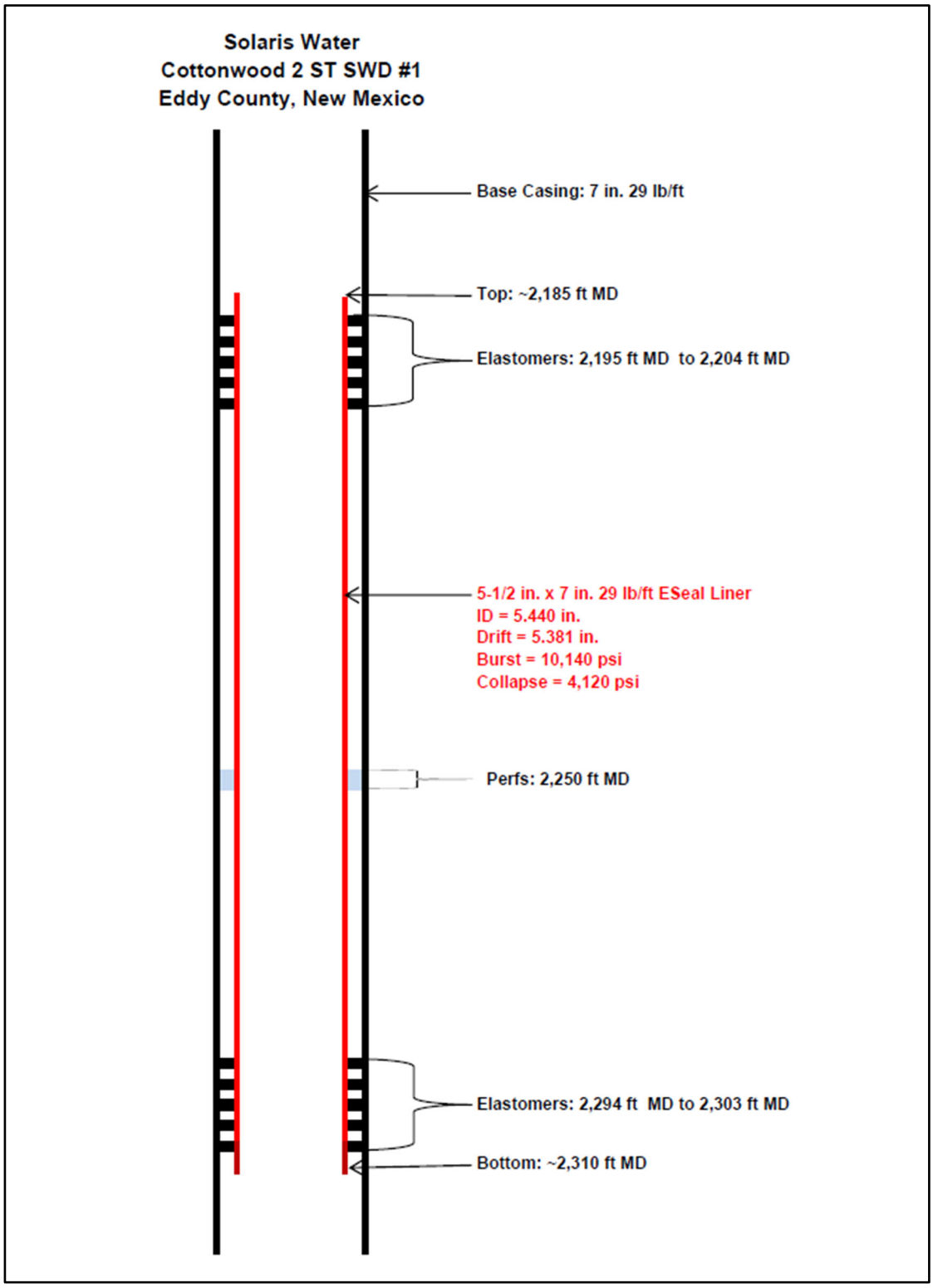
References

- API Specification Q2
- ISO 9001

Customer's WBS:



Enventure's WBS:



Specification Sheets

ENVENTURE SET® Solid Expandable System ESEAL™ LINER

5.500 in. OD 18.24 lb/ft x 7.000 in. OD 29.00 lb/ft ESeal Liner
Solaris Water
Cottonwood 2 St SWD 1
Preliminary

External Base Casing	
Nominal OD	7.000 in.
Weight	29.00 lb/ft
Nominal ID	6.184 in.
API Drift	6.059 in.
Connection Type	LTC
Connection ID	6.184 in.
Other ID Restriction	6.184 in.

Launcher	
Launcher OD - Pre Exp	5.969 in.

Connection Sleeves	
Set in Base Casing - Pre Exp OD	5.651 in.
Set in Base Casing - Expanded OD	6.151 in.

XPC Pre-Expansion Connection Specifications	
Tension Load Yield Rating	241,800 lb
Compressive Load Rating	241,800 lb
Minimum Parting Load	287,200 lb
Dogleg Severity Rating While Running	19.9 deg/100 ft

XPC Post-Expansion Connection Specifications	
Tension Load Yield Rating	202,500 lb
Compression Load Rating	166,700 lb
Minimum Parting Load	250,600 lb
Dogleg Severity Rating During Expansion	16.0 deg/100 ft

Well Bore Conditions (1)	
SET String Length	125ft
Wellbore Maximum Dogleg Severity	0.0 deg/100 ft
Deviation	0°
Mud Weight	8.5 lb/gal
Bottomhole Temperature (BHT)	150 F

SET Liner Pre-Expansion (2)	
SET Liner Grade	EX-80
Connection Type	GIIC
Nominal Yield Strength	80,000 psi
Minimum Ultimate Strength	95,000 psi
Nominal OD	5.500 in.
Nominal ID	4.840 in.
API Drift	4.715 in.
Nominal Wall Thickness	0.330 in.
Weight	18.24 lb/ft

SET Liner Post-Expansion (2,3)	
Nominal OD	6.071 in.
Nominal ID	5.440 in.
Drift	5.381 in.
Nominal Wall Thickness	0.316 in.
Nominal Weight	19.42 lb/ft
Internal Yield	7,490 psi
Burst (4)	10,140 psi
Collapse Rating (5)	4,120 psi
Expansion Ratio	12.4%
Pipe Body Yield Strength	402,600 lb

Anchor Hanger	
Set in Base Casing - Elastomer Thickness	0.120 in.
Pre-Exp Seal OD	5.740 in.
Clad in Base Casing (nominal)	48.7%

Limits while RIH	
Max. Running OD	5.969 in.
Max. Pump Rate (unlimited time)	2.5 BPM

(1) Changes in wellbore conditions require design review.
(2) All the published liner ratings and strengths are based on room temperature (75F), and not adjusted for BHT.
(3) Liner ratings are based on standlone liner without any support from base or external parent casing
(4) Hill's Fully-Plastic Burst Limit - Hill, R,. "The Mathematical Theory of Plasticity", Oxford University Press, 1950.
(5) Design collapse strength is calculated for 99.5% reliability (0.5% target reliability level) using post-expansion SET® collapse test data and ISO 10400 collapse calculation method G.4.1. All testing procedures followed API 5C3 / ISO 10400 guidelines.

SET Design Sheet; Rev P.1 Engr: Javier Via Reque Date Created: 18-Jul-2024

Loadout List:

Solaris Water
Cottonwood 2 ST SWD #1
5-1/2 in. x 7 in. 29 lb/ft ESeal Liner
Version 1

Enventure: 832-259-2130

Item	Qty	Part/Serial #	Size	Description	Supplier
1	10 joints		5-1/2 in.	Casing: 18.24 lb/ft, EX-80, XPC GIIC connection, SET	Enventure
2	1		5.969 in. OD	Launcher w/lower hanger joint with 0.120 in. Thick Viton Enastomers (5.440 in. OD cone) - ball seat, open ended	Enventure
3	3		5-1/2 in.	Anchor hanger joint 0.120 in. Viton elastomers	Enventure
4	1		5-1/2 in. x 12 ft	Pup joint: 18.24 lb/ft, EX-80, XPC GIIC connection, SET	Enventure
5	2		5-1/2 in.	Tapered guide (primary): 18.24 lb/ft, EX-80, XPC GIIC connection, SET	Enventure
6	15		5-1/2 in.	Connection sleeves: for 5-1/2 in. casing, 0.030 in. wall thickness	Enventure
7	1		2-7/8 in. in.	Safety sub: 2-7/8 in. PH6 (B) x Acme (P) w/protective cap	Enventure
8	1		5-1/2 in.	Debris catcher: 2-7/8 in. PH6 (B x P)	Enventure
9	1		5 ft x 3 ft x 2.5 ft	Gang box with miscellaneous tools & supplies	Enventure
10	2 each		13/16 & 15/16 in.	Brass and aluminum balls	Enventure
11	3		Tubes	Flex Lube (SET thread compound)	Enventure
12	1		5-1/2 in.	Casing drift for 5-1/2 in., 18.24 lb/ft, EX-80, XPC connection, SET	Enventure
13	3		12 oz can	Pitless spray	Enventure
14	3		12 oz can	Spray cleaner	Enventure
15	1		1.90 in.	Drillpipe drift (pump-through)	Enventure
16	20		5-1/2 in.	Seal rings for connectors	Enventure
17	2		5-1/2 in.	Lift nubbins: 5-1/2 in. XPC GIIC connection, left hand, box	Enventure
18	1		5-1/2 in.	Circulation crossover: 2-7/8 in. PH6 (B x P) x 5-1/2 in. XPC (B)	Enventure
19	2		3 in.	Foam balls	Enventure
20	3		NA	Application brushes	Enventure
21	1		NA	Spin-on table to run innerstring	Enventure
22	2		6.050 in. OD	Watermelon mills	Enventure
23	1		6.050 in. OD	Tapered Mill	Enventure
24	1		7 in. 29 ppf Casing	String Magnet	Enventure
25	1		5.380 in. OD	Bladed Mill	Enventure
26	1		5.530 in. OD	Watermelon Mill with smooth edges	Enventure

Rig

1	In Hole	Workstring	3-1/2 in.	Tubing with 3-1/2 in. PH6 connections	Rig
2	1		2 in.	Drift for drifting drillpipe (hollow)	Rig
3	2		XO	Crossovers - 3-1/2 in.PH6 (B) x 2-7/8 in. PH6 (P) - 1 in. minimum ID	Rig
4	1		3-1/2 in.	12 ft Pup Joint with 3-1/2 in. PH6 connection	Rig
5	1		3-1/2 in.	6 ft Pup Joint with 3-1/2 in. PH6 connection	Rig
7	2		3-1/2 in.	Molded Pump-in subs - 3-1/2 in. PH6 (Pin) x 2 in. 1502 Weco Union	Rig
8	2		3-1/2 in.	TIW with 3-1/2 in. PH6 (B x P) connections	Rig
15	1		NA	Mud Bucket	Rig
16	1		NA	Vacum Truck	Rig
17	1		NA	Casing Crew	Rig
18	1		NA	Forklift/laydown machine/hydraulic catwalk for handling equipment	Rig
19	1		NA	Pump Truck, chiksans, accessories	Rig

Rig

1	In Hole	Workstring	3-1/2 in.	Tubing with 3-1/2 in. PH6 connections	Rig
2	1		2 in.	Drift for drifting drillpipe (hollow)	Rig
3	2		XO	Crossovers - 3-1/2 in.PH6 (B) x 2-7/8 in. PH6 (P) - 1 in. minimum ID	Rig
4	1		3-1/2 in.	12 ft Pup Joint with 3-1/2 in. PH6 connection	Rig
5	1		3-1/2 in.	6 ft Pup Joint with 3-1/2 in. PH6 connection	Rig
7	2		3-1/2 in.	Molded Pump-in subs - 3-1/2 in. PH6 (Pin) x 2 in. 1502 Weco Union	Rig
8	2		3-1/2 in.	TIW with 3-1/2 in. PH6 (B x P) connections	Rig
15	1		NA	Mud Bucket	Rig
16	1		NA	Vacum Truck	Rig
17	1		NA	Casing Crew	Rig
18	1		NA	Forklift/laydown machine/hydraulic catwalk for handling equipment	Rig
19	1		NA	Pump Truck, chiksans, accessories	Rig

PUMPING SERVICE FOR EXPANDING SET SYSTEM			
1	1	Pump truckwith pressure lines (working pressure 8,000 psi)	Pumping
2	NA	Chiksans and accessories (two lead swivel chiksans)	Pumping
3	2	Lo-torque valves - 1502 WECO	Pumping
4	1	Portable gauges for pressure and rate that can be located near the drillers console.	Pumping
5	3	Radios with head sets for communication between Enventure and pumping company during expansion.	Pumping

Wellbore Preparations:

An Enventure PM (Project Manager), Operations Manager, Sales Manager, third party vendors involved, operator, and Company Man will perform ESOP (Expand SET on Paper) in Solaris Water's office or teleconference call prior to installation.

NOTE

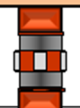
Any deviation from agreed upon installation procedure must be approved and documented by Enventure operations and the operator's office. Enventure Lead Project Manager will shut down operations any time a request to change is made by EGT, CO man, third-party, or Solaris Water's office. The request must be discussed, documented, and an educated final decision will be made by operator.

1. Make sure there are no leaks below the planned setting depth of post-expanded liner shoe (most important) and top. No other liner can be run through the expanded liner and be expanded below it.
2. Run and share caliper log results with Enventure to make sure hanger joints are placed in appropriate ID in the 7 in. 29 ppf casing.
3. Clean out wellbore as per fishing company procedures and BHAs to achieve:
   - wellbore free of debris
   - wellbore free of metal debris
   - free passage of dummy BHA (below) to setting depth without rotation (sliding only).
4. RIH with a casing scraper BHA **(Rig provided),** work scraper from 2,100 ft MD to 2,400 ft MD.

NOTE

Depending on wellbore conditions (amount of sand, metal debris on magnet, etc.), more than one run may be required.

5. Run in hole with dummy BHA **(Enventure provided)** as the following:

Operator:			Solaris Water	Operation:	5-1/2 in. x 7 in. 29 lb/ft ESeal Liner	
Rig:				Casing Size:	7 in.	
Well Name:			Cottonwood 2 ST SWD #1	Weight:	26 lb/ft	
AFE:				Drift:	6.059 in.	
BHA	ITEM	SIZE	DESCRIPTION	CONN.	OD"	LENGTH (feet)
	3	xx	String Magnet	xxx	for 7 in. 29 lb/ft	xxx
	2	6.050"	Watermelon Mill	xxx	6.050"	xxx
	1	6.050"	Tapered Mill or Bladed mill	xxx	6.050"	xxx

NOTE

Crossovers will need to be added where applicable.

6. Run this BHA down to 2,320 ft MD.

NOTE

If the above BHA cannot make it to setting depth, ream down to setting depth, POOH to above tight spot, then repeat run from kickoff point to setting depth till free passage without rotation (sliding/slacking off only) is observed.

7. Circulate well clean, pump sweeps.
8. POOH with the above BHA and gauge mills. Inspect magnets for metal debris.
9. Go to **Installation Procedure** section.

Pre-Installation Activities:

1. A pump truck/unit (8,000 psi work pressure) and accessories (chiksans, etc.) will be needed to expand liner. Co Man to source. Make sure pump rate, pressure, and volume is measurable and recordable during the job. Radio communication is essential between the pump truck and the rig floor. Pump truck to supply radios.
2. Upon arrival, all parties / service hands (Enventure, Casing Crew, and pump Operator) will inspect and verify that all their equipment is in excellent working order and that nothing is missing or damaged.
3. Report any problems or concerns ASAP to Enventure's Project Manager. It is imperative the job is done safe and correctly the first time.

NOTE

No operation will be rushed due to time constraints; there are none when it comes to safety and success.

4. The expandable liner will be received on location and will be unloaded using Enventure handling procedures to prevent any damage.
5. The threads will be visually inspected on location by Enventure Project Managers. The XPC seal rings in the box end threads will be installed at Enventure's shop in

Houston. Enventure's Project Managers will help offload pipe and witness the final drift run.

NOTE
No rig equipment is to be placed on the SET liner after it is laid out.

6. All workstring components needed must be drifted with their standard drift for the 3-1/2 in. PH6 tubing (inner string). All of the tubing and BHA components must be clean, drifted and free of scale internally.
7. Prior to making up the expandable liner, make up the Enventure circulation crossover assembly with a TIW valve on top and have it ready. This crossover (6 ft. long) has a 3-1/2 in. PH6 (Box x Pin) x 5-1/2 in. XPC (Box). This crossover will make up both the expandable casing and inner-string tubing. Details regarding this crossover will be discussed at pre-job meetings and on the rig floor.

NOTE
The rig will supply the TIW valve for 3-1/2 in. PH6 to be made up to top of EGT circulation crossover assembly.

Installation Procedure:

Conduct safety meeting and discuss JSA prior to rigging up casing tools and at any tour change or change of personnel. Record all attendees on a sign-in sheet. STOP work authority procedures must be applied by Enventure Project Managers and anyone else involved with operations anytime an unsafe act or operation is observed. Enventure's Operations and Operator's office must be notified and involved immediately and come up with a solution prior to resuming operations.

1. Rig up 5-1/2 in. liner running equipment, lay-down machine, and torque turn equipment. Liner will be run using 5-1/2 in. center latch or side-door elevators and hand slips. A safety clamp with low penetration dies will be used as per casing crew recommendation. A power tong with low penetration dies and integral backup will be used to make-up the XPC connections. The makeup torque will be from 3,200 ft-lb minimum to 6,400 ft-lb maximum. The yield torque is 7,900 ft-lb. Enventure Project Manager will have final call on a properly made-up connection. Baker-Lock will be used as thread compound and be provided by Enventure.
2. All joints will be run with Enventure lift nubbins bumped-up tight. The nubbin will support the entire weight of the string.
3. When making up the liner joints, make sure that the elevators are slacked-off of the lift nubbin to ensure that the nubbin is not backed out. One man will be assigned to watch these nubbins as the liner joints are being made up.

NOTE
Make sure the P-110 XPC lift nubbins are always tight and remain free from dirt. Do not grab the inside of these nubbins with dirty gloves; the XPC GllC -E threads may become galled. Keep rig floor clear of loose objects and follow good "housekeeping" practices running SET.

4. Pick up launcher and lower anchor hanger joint assembly and install in the well head. Carefully guide the launcher and lower anchor hanger through the well head.

NOTE
The bottom anchor hanger and launcher will be assembled at the Enventure's shop prior to delivery to the location. Total length of this assembly will be approximately ~24 ft. Assembly will include

	launcher with expansion cone, mandrel and safety sub installed. The launcher will be run with a ball seat and will be self-filling. The top connection of the anchor hanger will be an XPC LH pin. The launcher and the anchor hanger will be thread-locked with Flex-LubeX and torqued to 5,500 ft-lb at Enventure's shop.

5. Pick up and run range III joints and middle hanger joint of 5-1/2 in. liner and the upper hanger joint as per tally.

	NOTE
	Safety clamp will be used on casing as per casing companies' recommendation.

6. Land upper hanger joint low in the slips.
7. Install Enventure XPC slip-on table over the upper anchor hanger joint.
8. Rig down casing tools. Rig up 3-1/2 in. PH6 inner-sting elevators.
9. Rig up tubing tongs, bowl and 3-1/2 in. tubing slips on slip on table.
10. Pick up and run following inner-string BHA that has been drifted.
    - Upper safety sub – 3-1/2 in. PH6 (Box) x ACME (Pin) – Enventure provided
    - Debris catcher – 3-1/2 in. PH6 (Box x Pin) – Enventure provided
    - Crossover – 3-1/2 in. PH6 (B) x 2-7/8 in. PH6 (P) – Rig Provided
    - ~90 ft of 3-1/2 in. tubing – 3-1/2 in. PH6 (Box x Pin) – Rig provided

	NOTE
	• Look in tubing pin end on all stands to be sure there is no debris from wooden mats that can cause aluminum ball not to seat. Dope only pins. • Strip on the taper guide prior to making up the last stand of 3-1/2 in. PH6 tubing • 3-1/2 in. PH6 pup joints (6 ft, 12 ft) may be needed for space out.

11. Tag the top of the expansion cone assembly with the inner string. Make sure block/bails rotate freely ahead of time.
12. Make up inner string to cone assembly using power tongs with ~10 turns to right. Apply ~2,500 ft-lb torque.

	NOTE
	If block/bails do not rotate freely, a rental swivel will be needed. Verify with Tool pusher.

13. Once inner string is made up, fill up the annulus between the ID of liner and the OD of the 3-1/2 in. PH6 tubing with clean fluid.
14. Carefully pick up on the workstring and pull liner from slips.
15. Record weight indicator reading.
16. Remove the Enventure false table and strip on the Enventure tapered guide. Thread-lock (FlexLubeX) the tapered guide using Flex-Lube on the top of the upper anchor hanger joint.

	NOTE
	Liner may be circulated to clear sand, fill if any. Do not exceed 3,400 psi and 3 bpm.

17. RIH with liner on 3-1/2 in. PH6 tubing to 2,310 ft MD.
18. Verify tallies with Co Man and Toolpusher**. If there is an error, shut down and have a meeting with both offices (Operator and Enventure).**
19. Pick up and set the shoe at 2,306 ft MD (to allow for scoping).
20. Check to see that the mud bucket is rigged up and functional. During the expansion process the tubing will be full of fluid. A vacuum truck may be needed as per Solaris Water's requirements.
21. Conduct safety meeting and review procedure for expansion. Ensure that all necessary personnel are in communications with each other. Two-way radios will be used. Pump truck to supply.

NOTE
3-1/2 in. PH6 tubing will be spaced out where the 3-1/2 in. PH6 box connection is near rig floor.

22. Rig up pump truck, chiksans, chiksan swivel, Enventure's high pressure hose, chiksan swivel, low-torque valve, and 3-1/2 in. PH6 integral pump-in sub.
23. Pressure test lines to 6,000 psi for 5 minutes.
24. Circulate one tubing volume at 2 bpm - do not exceed 2 bpm and 2,400 psi.
25. Remove pump-in sub and drop 13/16 in. brass ball inside tubing.
26. Pump the ball down at 3 bpm. Land ball at the bottom of liner with 2,400 psi, hold for 2 minutes.

NOTE

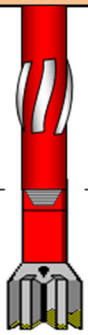
27. Start pumping at 1.5 bpm; expansion will begin at 4,500 psi. When expansion begins, the cone will move up showing a slight drop on the weight indicator. The driller will start picking up on the workstring as per Enventure Project Manager's advice, maintaining the workstring weight. **Do not use overpull during expansion at any time.**
28. Continue expansion until the first elastomers are anchored into the 7 in. casing. At that point the liner will be anchored in the base casing.

NOTE
First pull/expansion must be 30 ft. minimum. Enventure Project Manager will direct expansion operations as needed for a smooth expansion.

29. Expand the first single until the tool joint is at an appropriate height above the rig floor to break out connection.
30. Stop pumping and release pressure slowly. Expansion will be done pulling singles.
31. Record weight of the inner string while off expansion face. Slack off to set slips and break out connection. Break out and lay down joint.

NOTE
If fluid level in well is low, fluid may drain out of tubing should the cone be slacked off the cone face during expansion. This is not detrimental but slows down the expansion process. This can be mitigated by holding the cone on the cone face.

32. Start pumping at 1.5 bpm and pressure up and continue expansion of liner as directed by Enventure Project Manager until the expansion cone exits the top of the liner.
33. After the liner has been completely expanded, the well can be circulated as per Operator's requirement.
34. Pull out of the hole and lay down the expansion assembly.
35. Pressure-test the expanded liner to 2,500 psi.
36. Run in hole with 5.380 in. mill-out BHA **(Enventure provided).**
37. Mill out shoe of expanded liner on bottom but not the composite bridge plug yet.
38. Pressure test wellbore as per requirements.
39. Mill out composite bridge plug.
40. Circulate hole clean, POOH and lay down millout BHA.

Operator:			Solaris Water	Operation:	5-1/2 in. x 7 in. 29 lb/ft ESeal Liner	
Rig:				Casing Size:	5-1/2 in. Expanded	
Well Name:			Cottonwood 2 ST SWD #1	Weight:	19.42 lb/ft	
AFE:				Drift:	5.381 in.	
BHA	ITEM	SIZE	DESCRIPTION	CONN.	OD"	LENGTH (feet)
	3	5.380"	Watermelon Mill (SmoothOD)	xx	5.380"	xx
	1	5.380"	Junk (Bladed) Mill	xx	5.380"	xx

1.

Detail Schematic
Solaris Water Midstream

ENVENTURE
SET. The Standard.™

7.000 in. OD

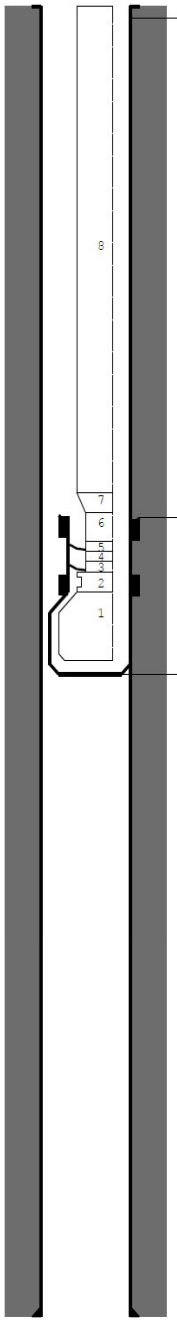
Weight (lb/ft):	ID (in.):	Drift (in.):
29.00 7" Casing	6.184	6.059
Top (ft): 0.00	Set (ft): 5000.00	
	Length (ft): 5000.00	

5.500 in. OD 6 jts 18.24 lb EX-80 Exp. Pipe

Description	Length (ft):	Top (ft):
132703-A TG	3.23	2,142.10
132680 - 20 Hanger	19.69	2,145.33
3 Jts	106.47	2,165.02
123041	35.22	2,271.49
Launcher	3.20	2,306.71
Shoe	0.09	2,309.91
Set At	0.00	2,310.00

Work String 1

	Length (ft):	Top (ft):	Jt#
3-1/2 PH6 Workstring 3.500 in. OD 69 jts/ 2150.54 ft	2,150.54	-16.02	8
Crossover 4.313 in. OD / 1.0 ft	1.00	2,134.52	7
2-7/8 PH6 Innerstring 2.875 in. OD / 31.11 ft	31.11	2,135.52	6
Upper Debris Catcher 4.700 in. OD / 3.95 ft	3.95	2,166.63	5
2-7/8 PH6 Innerstring 2.875 in. OD 4 jts/ 126.98 ft	126.98	2,170.58	4
Lower Debris Catcher 4.700 in. OD / 3.95 ft	3.95	2,297.56	3
3.5 in. OD Latch S/N 13039 / 24787	1.05	2,301.51	2
Exp. Cone 5.440 in. / 6.42 ft	6.42	2,302.56	1



5.500 in. OD 6 jts 18.24 lb EX-80 Exp. Pipe

	OD	ID
Before Expansion	5.500	4.840
Top		2,142.10
Bottom of Hanger		2,165.02
Bottom of Hanger		2,306.71
Bottom		2,310.00
	OD	ID
After Expansion	6.071	5.440
Top		2,148.04
Bottom of Hanger		2,170.14
Bottom of Hanger		2,306.76
Bottom		2,310.00

String	Capacity (bbl):	Displace (bbl):
7 29 lb 7" Casing	185.75	
Pre 5.500	3.82	1.11
Post 5.500	4.66	
3.5in	15.81	9.80
2.875in	0.87	0.58

String	In String	Ann. Vol. (bbl):
5.5 Pre	7 29 lb 7" Casing	1.30
5.5 Post	7 29 lb 7" Casing	0.22
2.875in	5.5 Pre	2.46
2.875in	5.5 Post	3.33
2.875in	7 29 lb 7" Casing	0.19
3.5in	7 29 lb 7" Casing	53.92

Sep 17,2024 10:53 AM *Page 1 of 1*

Expanded Pipe Tally

5.500 in. OD 6 jts 18.24 lb EX-80 Exp. Pipe

Operator	Solaris Water Midstream	**County**	Eddy
Field	Permian	**Location**	Land
Well	Cottonwood 2 ST SWD #1	**State**	New Mexico
Project No	P3356	**Project**	5-1/2 x 7 in Liner

Length measurements in Feet

			Exp Face Set At:	**2,308.08**	**Liner Set At:**	**2,309.91**
			Pre-Expansion		**Post Expansion**	
Component	**Description**	**CS Thickness**	**Length**	**Top**	**Length**	**Top**
Shoe	35144-1		0.09	2,309.91		
Launcher	35144		3.20	2,306.71	3.15	2,306.76
1	123041		35.22	2,271.49	33.96	2,272.80
2	132806		33.72	2,237.77	32.51	2,240.29
3	123318		35.44	2,202.33	34.17	2,206.12
4	140587		37.31	2,165.02	35.97	2,170.15
5	132680 - 20 Hanger		19.69	2,145.33	18.99	2,151.16
6	132703-A TG		3.23	2,142.10	3.11	2,148.05

Elastomer Details

5.500 in. OD 6 jts 18.24 lb EX-80 Exp. Pipe

Operator	Solaris Water Midstream	**County**	Eddy
Field	Permian	**Location**	Land
Well	Cottonwood 2 ST SWD #1	**State**	New Mexico
Project No	P3356	**Project**	5-1/2 x 7 in Liner

Joint # 1 **Serial #** 123041 **Comment**

Thickness 0 **Type**

Pre-Expansion			Post-Expansion		
Bottom	**Length**	**Top**	**Bottom**	**Length**	**Top**
2304.67	1.00	2303.67	2304.79	0.96	2303.83
2302.67	1.00	2301.67	2302.86	0.96	2301.90
2300.67	1.00	2299.67	2300.94	0.96	2299.97
2298.67	1.00	2297.67	2299.01	0.96	2298.04
2296.67	1.00	2295.67	2297.08	0.96	2296.11

Joint # 5 **Serial #** 132680 - 20 Hanger **Comment**

Thickness 0 **Type**

Pre-Expansion			Post-Expansion		
Bottom	**Length**	**Top**	**Bottom**	**Length**	**Top**
2161.95	1.00	2160.95	2167.18	0.96	2166.22
2159.95	1.00	2158.95	2165.25	0.96	2164.29
2157.95	1.00	2156.95	2163.32	0.96	2162.36
2155.95	1.00	2154.95	2161.40	0.96	2160.43
2153.95	1.00	2152.95	2159.47	0.96	2158.50

Personnel

Operator: Richard Breaux
Field: Permian Field
Well: Cottonwood 2 ST SWD
Project No: 3356

County: Eddy County
Location: Carlsbad
State: New Mexico
Project: 5-1/2 in. x 7 in. 29 lb/ft ESeal liner

Name:	Phone	On Location	Off Location
Company	Email		
Richard Breaux	Richard.breaux@enventuregt.com	9/6/2024	9/13/2024
Raymond Johnson	Raymond Johnson@enventuregt.com	9/6/2024	9/15/2024

Customer	Solaris Water Midstream LLC
Field	Carlsbad Field
Well	Cottonwood #2 ST SWD
Basin	Delaware Basin
Service GMT	3814
Stock / Equipment GMT, if different	N/A
Project Number	P3356
Work Order Number, if applicable	24-08-006
Country	USA
County/City/State or Province	Eddy County/Carlsbad/New Mexico
Operating Environment	Land
Water Depth (if applicable)	N/A
System	ESeal Liner
Size	5-1/2" x 7" x 0.330
XPC Connection	GIIC
Base Casing Weight (lb./ft)	29 ppf
Pre-Expanded Length	167.90 ft
# & Pre-Expanded Length of Anchor Hangers	(1) 19.69 ft.; (1) 35.22 ft.
Spacer Pipe Length (ESeal Flex only)	N/A
Category	Planned-Contingency
Application	CS: Casing Repair
Swellables	N/A
Sidetrack/Window Exit	No
Cone Exit Date/Time	9/9/2024 at 11:00 AM
Launcher OD/Type (Compact, Pressed)	5.969 inch, compact
Cone OD/Type (SR Cone, 10 deg)	5.440 inch 10 deg
Liner Hangers (#, size, type)	(2) 0.125 viton
Connections: # & size of sleeves	(5) .030 inch
Centralizers	No
Initiation Pressure/Overpull	4,500 psi with no overpull
Initiation Pressure on Launcher Calculations	3,580 psi
Avg. Expansion Pressure/Overpull	4,000 psi with 30K overpull
Slip-sticking observed? (Yes or No)	Yes
Top of Liner	2,148 ft
Shoe Depth	2,310 ft
Cement	No
Mud Type	Brine
Mud Weight	8.3 ppg
Dogleg Severity (Deg/100ft.)	0 deg/100 ft
Hole Angle	Straight
Pilot Hole or/and Open Hole Size	N/A
Bottom Hole Static Temp	100 F
Float Position	Open
Dart or ball displaced and landed	Ball
Foam Ball Used?	No
Liner Top Test	TBD
Total Revolutions (ESET only)	N/A
Post Job Report (PJR) Provided to Customer	
Service Design & Development Met Requirements	Yes
SET Overall Tier Rating (Design and Execution Validation)	1
Installation Team	Richard Breaux and Raymond Johnson
DOCO Tier Rating	1
Clean Out BHA String Components	
Clean Out Start Depth	
Clean Out End Depth	
Taper Mill ESN	
String #1 Mill ESN	
Magnet ESN	
Scraper ESN	Rental by customer
Cleanout Completion Date & Time (POOH Time)	9/7/2023
Mill Out BHA String Components	Mill, watermelon mill
Mill Out Start Depth	2,308 ft
Mill Out End Depth	2,310 ft.
Bladed Mill ESN	
String #2 Mill ESN	
Drillout Completion Date & Time (POOH Time)	9-13-2024 @ 1600 hours
Average RPM	60 rpm
Hours to Mill Out Shoe	4 hours
Average Weight On Bit	2,000 lbs
Average Torque	1200 ft. lbs
Pump Rate	0.5 bbls/min
Equipment Returning	Equipment will return after drill out
Additional Comments or Issues	

SOLARIS
WATER MIDSTREAM

September 24, 2024

Re: Post Workover NOI
Cottonwood 2 St SWD 1
30-015-42356
Property Code - 40518
Eddy Co., NM

To Whom It May Concern:

Solaris Water Midstream has completed the workover on the above captioned well, finished with a successful bradenhead and MIT test on 09.24.2024. As per the originally approved workover NOI, a drilling rig with hydraulic BOPs was rigged up and the existing injection tubing was pulled out of the hole, including the retrievable AS1-X packer.

A CBL log was ran across the entire wellbore showing TOC near surface with spotty cement from ~6,050' to surface. The 7" was perforated in three locations at 2,275', 2,225', and 2,190' attempting to circulate to surface up the 7" x 9-5/8" annulus after each location was perforated. No success on any of the three attempts. Next it was attempted to run a local expander tool from Renegade wireline (https://renegadewls.com/local-expander/) as a micro annulus was suspected. The 7" casing was expanded in multiple spots as per attached from 3,591.5' to 2,627' and 1,964' to 837'. No success, pressure still building in 7" x 9-5/8" annulus at surface. Perforations were then shot at 50' and 70' and were able to circulate up 7" x 9-5/8" annulus to surface. Cement was pumped down annulus receiving 9 bbls of cement to surface. No pressure seen at surface on 7" x 9-5/8" annulus for remainder of job. It was then discovered that the original perforations at 70' shot through the 9-5/8" casing. Cement was pumped down the 9-5/8" x 13-3/8" annulus with 2 bbls of clean cement seen to surface. The well was shut in at the end of this cement job and an attempt was made to squeeze cement further into the annulus but it was pressure locked. After a 36 hr cure time, both annuli were showing zero psi.

Subsequently, two expandable patches were ran to cover both sets of perforations in the 7" casing. The deeper patch was ran from 2,310' to 2,148' and the upper patch was ran from 115' to 19.2'. Both patches were tested successfully, then drilled out.

Cont.

3300 N. A St., Building 6, Unit 120, Midland, TX 79705
432.203.9020

A new tubing string was ran along with a new retrievable packer set with COE at 13,175'. The new injection tubing string is 4-1/2", 11.6#, P-110, BTC, GRE from surface to 10,617' by 3-1/2", 9.30#, HCP-110, EZGO FJ3-SWD, IPC from 10,617' to 13,175'. A new MIT and bradenhead test was called out and successfully performed after the workover to ensure wellbore integrity. A final installation wellbore diagram is attached for reference.

Thank you.

Sincerely,

Christopher Giese
Drilling Engineer
chris.giese@ariswater.com

ENVENTURE

Post-Job Report

5.5 x 7 in. 29.0 lb/ft ESeal Liner- upper liner

Solaris Water LLC

Cottonwood 2 ST SWD
Permian Basin
Eddy County, NM

September 6, 2024 – September 13, 2024

Prepared by	:	**Richard Breaux**
Mobile	:	**713-294-0091**
Office	:	**281-552-2200**
Fax	:	**281-552-2201**
E-mail	:	**richard.breaux@enventuregt.com**

Version: 1.0

Table of Contents

Purpose:
To safely and successfully install a ~40 ft x 5-1/2 in. x 7 in. 29 lb/ft ESeal HP liner to cover up and isolate a leak in 7 in. 29 lb/ft casing at 50 ft & 70 ft. MD. ESeal HP Patch will be set from 10 ft MD (top of liner after expansion) to 115 ft MD (bottom of patch after expansion). After initiation, the liner will be expanded with casing jacks.

Scope
This process applies to all operations personnel of Enventure Global Technology, Inc. (EGT) and its global locations.

Responsibility
- **Operations Management -** Responsible for reviewing and ensuring training and implementation of this process for relevant operation installations
- **Operations / Project Managers -** Responsible for adjusting the generic installation procedures as applicable for relevant jobs, communicating the procedure internally and externally, and following the requirements during operations
- **Sales Manager –** Responsible for maintaining client relationships and dispersing customer information and requirements to relevant EGT stakeholders.
- **Engineering –** Provides technical support, such as but not limited to evaluation of customer technical information and development of EGT System Design Specifications.

References
- API Specification Q2
- ISO 9001

Specification Sheet:

ENVENTURE SET® Solid Expandable System

ESEAL™ LINER

5.500 in. OD 18.24 lb/ft x 7.000 in. OD 29.00 lb/ft ESeal Liner

Solaris Water

Cottonwood 2 St SWD 1

GMT ID: 3814

External Base Casing	
Nominal OD	7.000 in.
Weight	29.00 lb/ft
Nominal ID	6.184 in.
API Drift	6.059 in.
Connection Type	LTC
Connection ID	6.184 in.
Other ID Restriction	6.184 in.

Launcher	
Launcher OD - Pre Exp	5.969 in.

Connection Sleeves	
Set in Base Casing - Pre Exp OD	5.651 in.
Set in Base Casing - Expanded OD	6.151 in.

XPC Pre-Expansion Connection Specifications	
Tension Load Yield Rating	241,800 lb
Compressive Load Rating	241,800 lb
Minimum Parting Load	287,200 lb
Dogleg Severity Rating While Running	19.9 deg/100 ft

XPC Post-Expansion Connection Specifications	
Tension Load Yield Rating	202,500 lb
Compression Load Rating	166,700 lb
Minimum Parting Load	250,600 lb
Dogleg Severity Rating During Expansion	16.0 deg/100 ft

Well Bore Conditions (1)	
SET String Length	125 ft
Wellbore Maximum Dogleg Severity	0.0 deg/100 ft
Deviation	0°
Mud Weight	8.5 lb/gal
Bottomhole Temperature (BHT)	150 F

SET Liner Pre-Expansion (2)	
SET Liner Grade	EX-80
Connection Type	GIIC
Nominal Yield Strength	80,000 psi
Minimum Ultimate Strength	95,000 psi
Nominal OD	5.500 in.
Nominal ID	4.840 in.
API Drift	4.715 in.
Nominal Wall Thickness	0.330 in.
Weight	18.24 lb/ft

SET Liner Post-Expansion (2,3)	
Nominal OD	6.071 in.
Nominal ID	5.440 in.
Drift	5.381 in.
Nominal Wall Thickness	0.316 in.
Nominal Weight	19.42 lb/ft
Internal Yield	7,490 psi
Burst (4)	10,140 psi
Collapse Rating (5)	4,120 psi
Expansion Ratio	12.4%
Pipe Body Yield Strength	402,600 lb

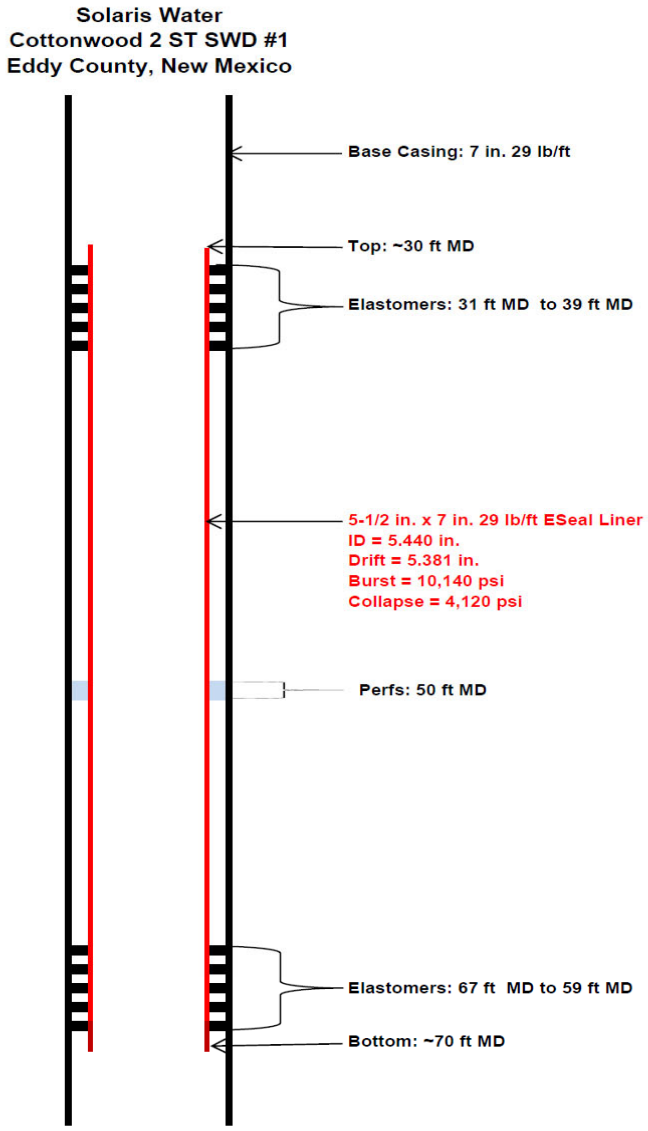
Anchor Hanger	
Set in Base Casing - Elastomer Thickness	0.125 in.
Pre-Exp Seal OD	5.750 in.
Clad in Base Casing (nominal)	50.6%

Limits while RIH	
Max. Running OD	5.969 in.
Max. Pump Rate (unlimited time)	2.5 BPM

(1) Changes in wellbore conditions require design review.
(2) All the published liner ratings and strengths are based on room temperature (75F), and not adjusted for BHT.
(3) Liner ratings are based on standlone liner without any support from base or external parent casing
(4) Hill's Fully-Plastic Burst Limit - Hill, R,. "The Mathematical Theory of Plasticity", Oxford University Press, 1950.
(5) Design collapse strength is calculated for 99.5% reliability (0.5% target reliability level) using post-expansion SET® collapse test data and ISO 10400 collapse calculation method G.4.1. All testing procedures followed API 5C3 / ISO 10400 guidelines.

SET Design Sheet; Rev P.1 Engr: Javier Via Reque Date Created: 19-Jul-2024

WBS with ESeal Patch Installed:



Pre-Installation Activities:

An Enventure PM (Project Manager), operations manager, sales manager, third party vendors involved, operator, and company man to perform an ESOP (Expand SET on Paper) in Solaris office or teleconference call prior to installation.

	NOTE
	Any deviation from agreed upon installation procedure must be approved and documented by Enventure operations and operator's office. Enventure lead Project Manager will shut down operations any time a request to change is made by EGT, CO Man, third-party, or client's office. The request must be discussed, documented, and an educated final decision will be made by Client.

The following items have been discussed and agreed upon in order to maximize the chances for safe and successful installation:

1. Determine exact depth of the area to be covered by the ESeal HP Patch. There is only ~20 ft of sealing coverage per side.
2. Enventure PM to measure the blank pipe distance between the elastomers. Half of that distance will be the allowable error/discrepancy with tallies/coil tubing allowed. If the error or discrepancy in tallies or coil when tagging composite bridge plug, or logs, is greater than half of the distance of the blank pipe between the elastomers, the Patch will be POOH.
3. Make sure there are no leaks in the base casing below and at least 10 ft above the ESeal HP Patch setting depth (bottom and top of expanded ESeal HP Patch). No other system can be run through and expanded below an installed one. Also, in order to install another ESeal HP Patch above a previously installed one, a minimum of 10 ft good pipe is required.
4. If the leak path has been squeezed with cement, a scraper run must be performed to scrape off any cement sheath in the base casing where the elastomers are to be set.
5. Verify the ID of base casing at the area where ESeal HP Patch will be set (caliper logs). Elastomer thickness is designed to be clad in the nominal ID of the new casing – any greater ID caused by milling, corrosion, wear, could cause elastomer not to clad.

	NOTE
	Pump sweeps if milling took place.

6. The base casing must be inspected for adequate clearance and all the dimensions must be verified. The OD of the seals is 5.750 in. The OD of the launcher is 5.969 in. **Maximum OD of the system running in hole will be 5.969 in.**
7. The expandable patch will be received on location and will be unloaded using the specified Enventure handling procedures to prevent any damage.

NOTE
Enventure project manager will be on location to witness unloading.

8. All workstring components that might be needed must be drifted with their standard drift. If possible, they should be made up and racked back in stands. All of the tubing and BHA components must be clean, drifted and free of scale internally and if possible pressure tested prior to the expansion.
9. All the workstring components must be designed for the required specifications regarding pressure and tensile strength. Two joints of 2-7/8 in. PH6 connection tubing will be used for the inner-string and 2-7/8 in. PH6 connection tubing for the work string (rig work string). A 2-7/8 in. (B) will be sticking out of the patch. The ESeal HP Patch is open and a ball is required to be seated before beginning expansion. **There is no active float in this system. The shoe of the system is designed to have minimal debris fall off during drill out of set shoe.**
10. The hole should be well circulated, if possible. The fluid should be properly conditioned for running the patch. Clean fluid should be used for the expansion process.

NOTE
This system can be expanded with a variety of fluids (i.e. brine, production water, and/or mud) but the fluids must be relatively clean and have minimal solids.

11. Circulate hole clean. If possible, drop a pump-through drift in the workstring if the conditions allow and pull out of the hole to run the patch. All tubing and BHA components must be clean, drifted and free of scale internally.
12. All union connections in pumping lines from pump truck to the tubing tool joints must be 1502 WECO integral, not threaded. The requirement on pressure rating for all surface equipment (pumping lines and connections) will be 10,000 psi working pressure. The lines have to be pressure tested to at least 1,000 psi greater than the anticipated highest expansion pressure. Data acquisition is required to record pressure. A certified Coil-Flex high pressure hose with a working pressure of 13,500 psi is recommended for expansion operations and can be sourced and provided by Enventure.

Installation Procedure:

NOTE
Conduct a safety meeting prior to rigging up and at any or change of personnel. Record all attendees on sign-in sheet. STOP Work Authority procedures must be applied any time an unsafe act/operation/confusion is observed. Enventure operations and client office must be involved immediately.

1. Pick up the ESeal HP Patch with 0.125 in. thick Viton elastomers and carefully guide ESeal HP Patch the BOP stack. Any well control situation needs to

consider that there is no float in the system and would require a TIW valve or some other system to mitigate the risk, should it develop.

	NOTE
	• The ESeal HP Patch will be assembled in the shop prior to delivery to location. Total length of this assembly will be approximately 40 ft. Assembly will include launcher with expansion cone, mandrel with safety sub made up and one joint of 2-7/8 in. PH6 connection tubing sticking up out of the Patch.

2. Run patch in the hole at on rig tubing to 70 ft MD.
3. **Verify tallies with pipe mark, get approvals from Company Man.**
4. Pick up and space out the shoe at 70 ft MD. Enventure PM will be present on rig floor to watch weight indicator.
5. Record pickup and slack-off weights at setting depth. (Fluid may “come over the top” as the string is lowered into the wellbore due to auto-fill position at the shoe of the system).

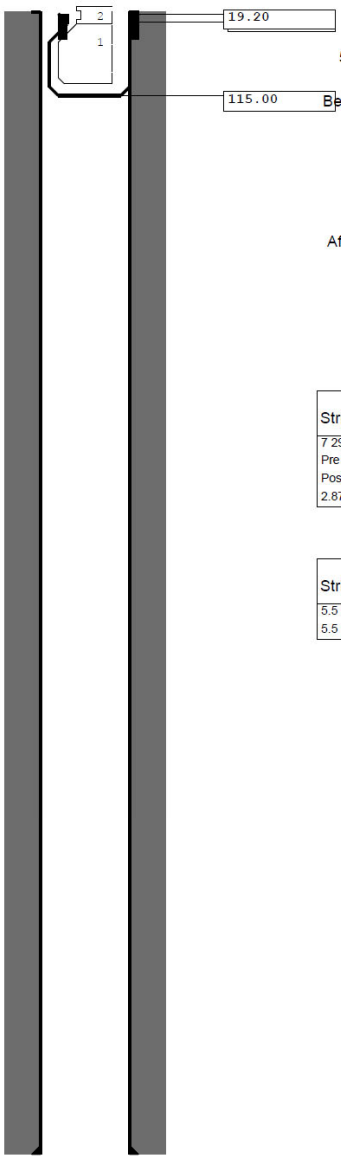
	NOTE
	If the tallies depth does not match the wireline depth of composite bridge plug, shut down operations, call Enventure’s operations manager and operator’s engineer in office to discuss options. If the error or discrepancy of tallies depth when tagging composite bridge plug is greater than half of the distance of the blank pipe between the elastomers, the Patch will be POOH. If there are errors or discrepancy is smaller, options will be discussed with Enventure and operator’s office and decisions will be made accordingly.

6. Rig up pump truck, chiksans, lead chiksan swivel, Enventure hi-pressure hose, lead chiksan swivel, Lo-Torque valve, 2-7/8 in. PH6 molded pump-in sub.
7. Open the low torque valve and circulate for at least one tubing volume to clean the hole. Circulation rate should not exceed 1.5 bbl/min and 3,200 psi circulation pressure.
8. Break out the 2-7/8 in. PH6 pump-in sub.
9. Drop 13/16 in. aluminum ball in the workstring. **Prior to dropping ball, well must be static**.
10. Make up the 2-7/8 in. pump-in sub on tubing box looking up at rig floor.
11. Close low-torque valve.
12. Pressure test pump and line to 8,000 psi for 5 minutes.
13. Open low-torque valve.
14. Conduct a safety meeting and review procedure for expansion. Ensure that all necessary personnel are in communications with each other. A pressure monitor must to be placed close to the drillers’ position on the rig to be viewed by the Enventure PM and a record (chart) of the pressures and times will be requested by Enventure after the expansion.
15. Start pumping ball down at 0.5 bbl/min.
16. Land ball with 3,200 psi.
17. Stop pumps, monitor pressure for one minute.
18. Start pumping at 1 bbl/min and pressure up to initiate expansion (rupture discs of 4,000 psi will rupture first, but will not be noted at surface); expansion should begin at approximately 7,000 psi depending on the hydro-static pressure of the well bore.

19. Continue pumping at 0.5 bbl/min and pressure up tubing string. As the expansion begins, the patch will scope off of the cone 0.5 ft until the first elastomer is expanded into the 7 in. casing. At that point the system will be anchored.
20. Stop pumping, bleed off pressure.
21. Rig up casing jacks to complete expansion.
22. Pull out of the hole and lay down the expansion assembly.
23. Close the annulus and pressure test the expanded patch to 3,000 psi.
24. Make up the 5.381 in. mill-out assembly and run in the hole. The drift ID of the expanded patch is 5.440 in.
25. Mill out the shoe of ESeal HP Patch (~12 in. long). The 4 or 5-bladed mills have been most successful in milling out ESeal HP Patch shoe in the past.
26. The entire ESeal HP Patch can be pressure tested as per customer specifications at this time if a bridge plug is set below, or casing below has pressure integrity.
27. Mill out composite bridge plug.
28. Circulate hole clean, POOH with millout BHA.

Detail Schematic
Solaris Water Midstream

ENVENTURE
SET. The Standard.™



7.000 in. OD

Weight (lb/ft):	ID (in.):	Drift (in.):
29.00 P-110	6.184	6.059
Top (ft): 0.00		Set (ft): 10000.00
		Length (ft): 10000.00

5.500 in. OD 4 jts 18.30 lb EX-80 Exp. Pipe

Description	Length (ft):	Top (ft):
125703-A	3.22	15.71
123419	35.44	18.93
1 Jts	37.61	54.37
132979	19.69	91.98
Launcher	3.24	111.67
Shoe	0.09	114.91
Set At	0.00	115.00

Work String Run 1

	Length (ft):	Top (ft):	Jt#
Tubing 2.875 in. OD 3 jts/ 94.82 ft	94.82	3.82	5
Debris Catcher 4.700 in. OD / 3.95 ft	3.95	98.64	4
Debris Catcher 4.700 in. OD / 3.95 ft	3.95	102.59	3
3.430 in. OD Latch S/N 13045 / 13045	1.05	106.54	2
Exp. Cone 5.440 in. / 6.42 ft	6.42	107.59	1

5.500 in. OD 4 jts 18.30 lb EX-80 Exp. Pipe

	OD	ID
Before Expansion	5.500	4.840
Top		15.71
Bottom of Hanger		54.37
Bottom of Hanger		111.67
Bottom		115.00
	OD	ID
After Expansion	6.071	5.440
Top		19.20
Bottom of Hanger		56.47
Bottom of Hanger		111.72
Bottom		115.00

String	Capacity (bbl):	Displace (bbl):
7 29 lb P-110	371.50	
Pre 5.500	2.26	0.66
Post 5.500	2.75	
2.875in	0.55	0.39

String	In String	Ann. Vol. (bbl):
5.5 Pre	7 29 lb P-110	0.77
5.5 Post	7 29 lb P-110	0.13

Sep 12,2024 8:56 AM *Page 1 of 1*

Expanded Pipe Tally

5.500 in. OD 4 jts 18.30 lb EX-80 Exp. Pipe

Operator	Solaris Water Midstream	**County**	Eddy
Field	Permian	**Location**	Land
Well	Cottonwood 2 ST SWD #1	**State**	New Mexico
Project No	P3356-1	**Project**	5.5 x 7 in. Surface liner

Length measurements in Feet

Exp Face Set At: 113.11 **Liner Set At: 114.91**

			Pre-Expansion		Post Expansion	
Component	**Description**	**CS Thickness**	**Length**	**Top**	**Length**	**Top**
Shoe	Ht# 201116525		0.09	114.91		
Launcher	36186		3.24	111.67	3.19	111.72
1	132979		19.69	91.98	18.99	92.73
2	132828		37.61	54.37	36.26	56.47
3	123419		35.44	18.93	34.17	22.30
4	125703-A		3.22	15.71	3.10	19.20

Elastomer Details

5.500 in. OD 4 jts 18.30 lb EX-80 Exp. Pipe

Operator	Solaris Water Midstream	**County**	Eddy
Field	Permian	**Location**	Land
Well	Cottonwood 2 ST SWD #1	**State**	New Mexico
Project No	P3356-1	**Project**	5.5 x 7 in. Surface liner

Joint # 1 **Serial #** 132979 **Comment**

Thickness 0.125 **Type** Viton

Pre-Expansion			Post-Expansion		
Bottom	**Length**	**Top**	**Bottom**	**Length**	**Top**
108.67	1.00	107.67	108.83	0.96	107.86
106.67	1.00	105.67	106.90	0.96	105.94
104.67	1.00	103.67	104.97	0.96	104.01
102.67	1.00	101.67	103.04	0.96	102.08
100.67	1.00	99.67	101.12	0.96	100.15

Joint # 3 **Serial #** 123419 **Comment**

Thickness 0.125 **Type**

Pre-Expansion			Post-Expansion		
Bottom	**Length**	**Top**	**Bottom**	**Length**	**Top**
34.52	1.00	33.52	37.33	0.96	36.37
32.52	1.00	31.52	35.41	0.96	34.44
30.52	1.00	29.52	33.48	0.96	32.51
27.52	1.00	26.52	30.58	0.96	29.62
25.52	1.00	24.52	28.66	0.96	27.69

Personnel

Operator: Richard Breaux
Field: Permian Field
Well: Cottonwood 2 ST SWD
Project No: 3356

County: Eddy County
Location: Carlsbad
State: New Mexico
Project: 5-1/2 in. x 7 in. 29 lb/ft ESeal liner

Name:	Phone	On Location	Off Location
Company	Email		
Richard Breaux	Richard.breaux@enventuregt.com	9/6/2024	9/13/2024
Raymond Johnson	Raymond Johnson@enventuregt.com	9/6/2024	9/15/2024

Customer	Solaris Water Midstream LLC
Field	Carlsbad Field
Well	Cottonwood #2 ST SWD
Basin	Delaware Basin
Service GMT	3814
Stock / Equipment GMT, if different	N/A
Project Number	P3356
Work Order Number, if applicable	24-08-006
Country	USA
County/City/State or Province	Eddy County/Carlsbad/New Mexico
Operating Environment	Land
Water Depth (if applicable)	N/A
System	ESeal Liner
Size	5-1/2" x 7" x 0.330
XPC Connection	GIIC
Base Casing Weight (lb./ft)	29 ppf
Pre-Expanded Length	99.29 ft
# & Pre-Expanded Length of Anchor Hangers	(1) 19.69 ft.; (1) 35.44 ft.
Spacer Pipe Length (ESeal Flex only)	N/A
Category	Planned-Contingency
Application	CS: Casing Repair
Swellables	N/A
Sidetrack/Window Exit	No
Cone Exit Date/Time	9/12/2024 at 12:00 PM
Launcher OD/Type (Compact, Pressed)	5.969 inch, compact
Cone OD/Type (SR Cone, 10 deg)	5.440 inch 10 deg
Liner Hangers (#, size, type)	(2) 0.125 viton
Connections: # & size of sleeves	(1) .030 inch
Centralizers	No
Initiation Pressure/Overpull	7,000 psi with no overpull
Initiation Pressure on Launcher Calculations	3,580 psi
Avg. Expansion Pressure/Overpull	5,000 psi with 30K overpull
Slip-sticking observed? (Yes or No)	Yes
Top of Liner	19 ft
Shoe Depth	115 ft
Cement	No
Mud Type	Brine
Mud Weight	8.3 ppg
Dogleg Severity (Deg/100ft.)	0 deg/100 ft
Hole Angle	Straight
Pilot Hole or/and Open Hole Size	N/A
Bottom Hole Static Temp	100 F
Float Position	Open
Dart or ball displaced and landed	Ball
Foam Ball Used?	No
Liner Top Test	TBD
Total Revolutions (ESET only)	N/A
Post Job Report (PJR) Provided to Customer	
Service Design & Development Met Requirements	Yes
SET Overall Tier Rating (Design and Execution Validation)	1
Installation Team	Richard Breaux and Raymond Johnson
DOCO Tier Rating	1
Clean Out BHA String Components	
Clean Out Start Depth	
Clean Out End Depth	
Taper Mill ESN	
String #1 Mill ESN	
Magnet ESN	
Scraper ESN	Rental by customer
Cleanout Completion Date & Time (POOH Time)	9/7/2023
Mill Out BHA String Components	Mill, watermelon mill
Mill Out Start Depth	113 ft
Mill Out End Depth	115 ft.
Bladed Mill ESN	
String #2 Mill ESN	
Drillout Completion Date & Time (POOH Time)	9-14-2024 @ 1600 hours
Average RPM	60 rpm
Hours to Mill Out Shoe	4 hours
Average Weight On Bit	2,000 lbs
Average Torque	1200 ft. lbs
Pump Rate	0.5 bbls/min
Equipment Returning	Equipment will return after drill out
Additional Comments or Issues	

Expansion Intervals

Run 1	Sequence 1	Expansion 1	3591.5	Bottom
Run 1	Sequence 1	Expansion 2	3588.5	Top
Run 1	Sequence 1	Expansion 3	**3590**	Middle
Run 1	Sequence 2	Expansion 1	2981.5	Bottom
Run 1	Sequence 2	Expansion 2	2978.5	Top
Run 1	Sequence 2	Expansion 3	**2980**	Middle
Run 1	Sequence 3	Expansion 1	2887.5	Bottom
Run 1	Sequence 3	Expansion 2	2884.5	Top
Run 1	Sequence 3	Expansion 3	**2886**	Middle
Run 1	Sequence 4	Expansion 1	2851.5	Bottom
Run 1	Sequence 4	Expansion 2	2848.5	Top
Run 1	Sequence 4	Expansion 3	**2850**	Middle
Run 1	Sequence 5	Expansion 1	2761.5	Bottom
Run 1	Sequence 5	Expansion 2	2758.5	Top
Run 1	Sequence 5	Expansion 3	**2760**	Middle
		Potential		
Run 1	Sequence 6	Expansion 1	2628.5	Bottom
Run 1	Sequence 6	Expansion 2	2625.5	Top
Run 1	Sequence 6	Expansion 3	**2627**	Middle

Local Expander Annular Squeeze Tool

Annular Isolation Service

Company: Solaris Midstream
Well: Cottonwood 2 State Swd 1
Field:
County: Eddy
State: New Mexico

Company:	Solaris Midstream		
Well:	Cottonwood 2 State Swd 1		
Field:			
County / Parish:	Eddy	State:	New Mexico
Location:		API:	30-015-42356
Date of Service:			
Number of Runs:			
Number of Sequences:			
Expansions Correlated to:	Renegade R CBL 8/27/2024		

Casing Detail	OD/In	Wt/Ft	Grade	Special
	7	29	P-100	

LET Specialist:
Witnessed By:
Hoist Provided By:

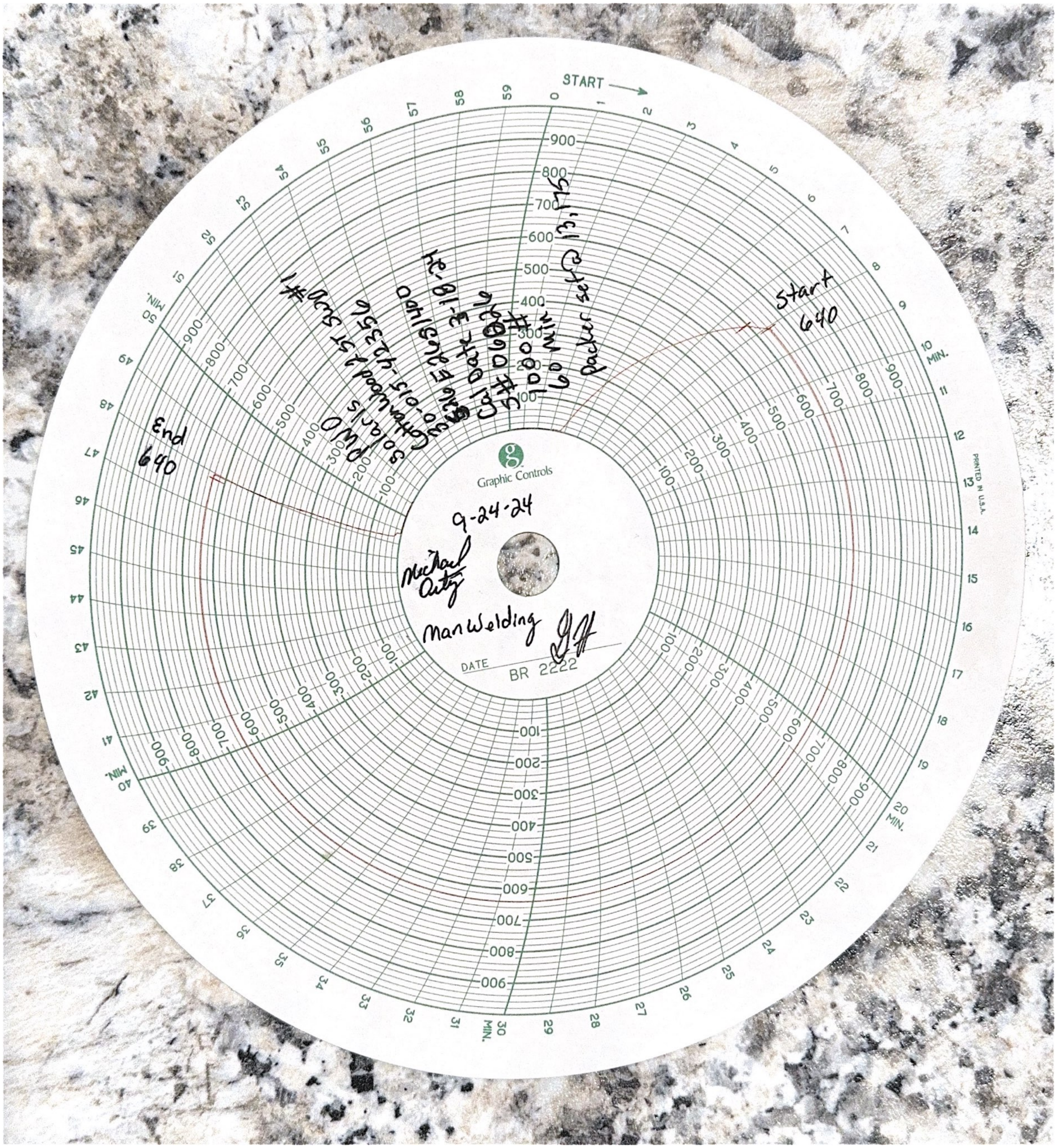
All intervals recommended are opinions based on inferences from electrical or other measurements and RWLS, LLC DBA Renegade Services cannot and do not guarantee the accuracy or correctness of those interpretations, RWLS, LLC DBA Renegade Services will not, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation or recommended operation made by any of our officers, agents, or employees.

Expansion Intervals

Run 1	Sequence 1	Expansion 1	838.5	Bottom
Run 1	Sequence 1	Expansion 2	835.5	Top
Run 1	Sequence 1	Expansion 3	**837**	Middle
Run 1	Sequence 2	Expansion 1	933.5	Bottom
Run 1	Sequence 2	Expansion 2	930.5	Top
Run 1	Sequence 2	Expansion 3	**932**	Middle
Run 1	Sequence 3	Expansion 1	1061.5	Bottom
Run 1	Sequence 3	Expansion 2	1058.5	Top
Run 1	Sequence 3	Expansion 3	**1060**	Middle
Run 1	Sequence 4	Expansion 1	1341.5	Bottom
Run 1	Sequence 4	Expansion 2	1338.5	Top
Run 1	Sequence 4	Expansion 3	**1340**	Middle
Run 1	Sequence 5	Expansion 1	1601.5	Bottom
Run 1	Sequence 5	Expansion 2	1598.5	Top
Run 1	Sequence 5	Expansion 3	**1600**	Middle
Run 1	Sequence 6	Expansion 1	1805.5	Bottom
Run 1	Sequence 6	Expansion 2	1802.5	Top
Run 1	Sequence 6	Expansion 3	**1804**	Middle

Potential

Run 1	Sequence 7	Expansion 1	1965.5	Bottom
Run 1	Sequence 7	Expansion 2	1962.5	Top
Run 1	Sequence 7	Expansion 3	**1964**	Middle


START
Graphic Controls
Start
640
End
640
9-24-24
Man Welding
DATE
BR 2222

CHARTS ltd.

CALIBRATION CERTIFICATE

Cert Date;	3/18/2024
Due Date:	3/18/2025

Customer:	MAN WELDING
Model:	RECORDER 8"
serial:	06026

This is to certify that this instrument has been inspected and tested against ADDITEL Digital Gauge ADT680-GP30K, SN: 218183B0028 Calibrated (03/30/2023) Due Date (03/30/2025) Reference Standard used in this calibration are traceable to the SI Units through NIST. This calibration is compliant to ISO/IEC 17025:2017 and ANSI/NCSL Z540-

This instrument is cerified to be accurate within +/- 1% of Full Scale

Input Type/ Range: 1000# **Color:RED**
Pen Number: 2

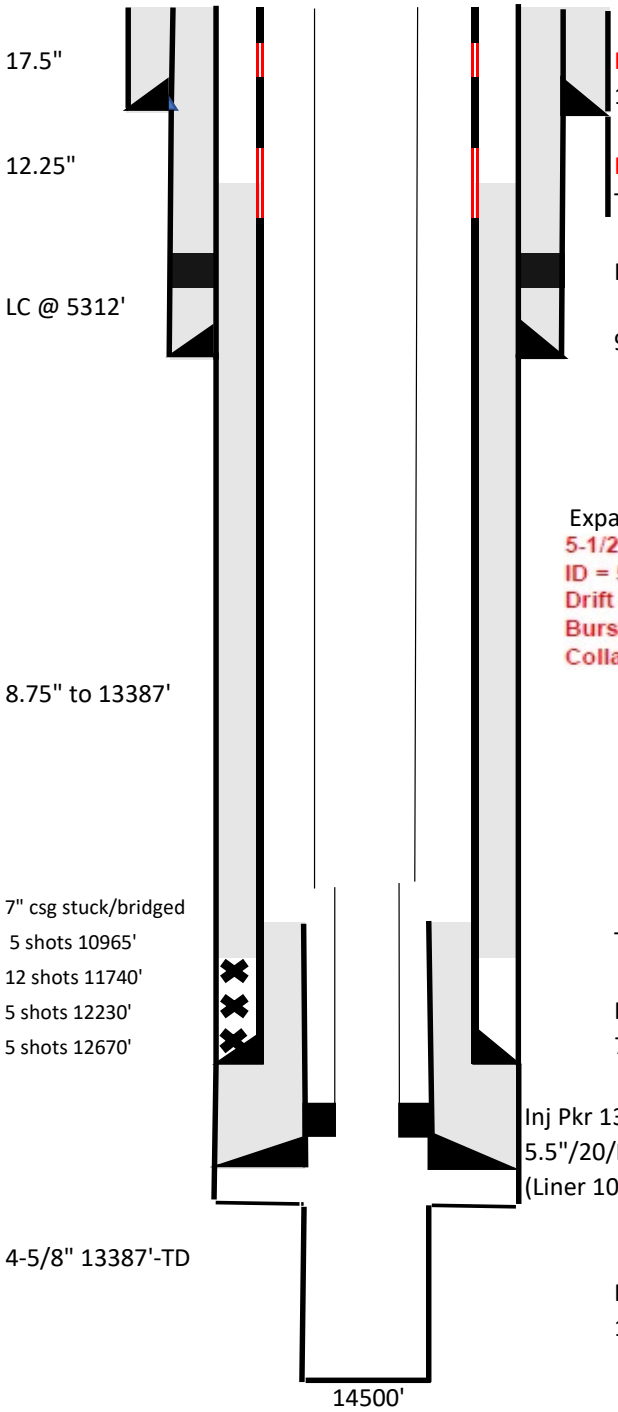
		Descending	
Applied:	Reading:	Applied:	Reading:
0	0	999	1000
199	200	798	800
499	500	498	500
798	800	199	200
999	1000	0	0

2031 TRADE DR.
MIDLAND, TX 79706
(432) 697-7801 (432) 520-3564

Technician: Susanna Yhapes

400' FSL, 1400' FEL
O-2-26s-26e
Eddy, NM
30-015-42356

Zero:	27' agl	C108	SWD-1473
KB elev:	3325.8'	Max Press	2620 psi
GL elev:	3298.8'	Permit	13100-14600'
		Actual	13270-14500'
		Approved	4/10/2014



Eventure Exp Liner 19.2' - 115'; Perf @ 50', 70'
13-3/8"/54.5/J55/STC @ 403' — 400 sx "C" (circ 125 sx)
Eventure Exp Liner 2,310' - 2,148'; Perf @ 2,275', 2,225', 2,190'
TOC 2250' CBL

DV/ECP 4506' — Stg 1: 250 sx HLC + 100 sx "C" (circ 67 sx)
9-5/8"/43.5/HCP110/BTC @ 5559' — Stg 2: 1200 sx Econocem + 200 sx "C" (circ 201 sx)

Tubing:
Stainless 2-7/8" On/Off Tool
Stainless 3.5" EZGO FJ3 x 2-7/8" EUE xo
2558' 3.5"/10/L80/EZGO FJ3 SWD
316SS 4.5" BTC x 3.5" EZGO FJ3 SWD xo
10617' 4.5"/13.1/P110/BTC TK Liner
4.5" 316SS BTC pin x
BTC pin xo at top of string
(10', 4' pup jts on top)

Expandable Liners:
5-1/2 in. x 7 in. 29 lb/ft ESeal Liner
ID = 5.440 in.
Drift = 5.381 in.
Burst = 10,140 psi
Collapse = 4,120 psi

Packer:
Nickel Plated 5-1/2" x 3" AS1-X pkr Tryton
17-4 SS Flow Wet Internals
Stainles 2.313" XN nipple

Wellhead:
7-1/16" 2205 Duplex tbg hngr ACME lift
7-1/16" 3k x 4-1/16" 5k 316ss THA
4-1/16" 5k 316ss tree (2 master, tee, crown cap--3600 psi WP)

TOL 10825'

DV/ECP 7" 12772'
7"/29/HCP110/LTC @ 12793' — 800 sx HiYield + 200 sx "H" (cmt from 10965' perfs)

Inj Pkr 13,185'
5.5"/20/P110/FJM liner 10825-13270' — 100 sx HLC + 50 sx "H" (circ 28 sx off liner top)
(Liner 10819-13262' wireline logs)

Devonian/Silurian OH
13270-14500'

Jan 2015: Went into service.
Mar 2019: Repair WO tbg/pkr leak. New tbg and new CRA perm pkr run.
Pumped 4000 g solvent soak + 40000 g 15% HCL + 15000 g 2500ppm ClO2 4 stgs.
Aug 2022: Repair WO tbg leak. Repaired tubing and new AS1-X pkr ran. cgiese 25-Sep-24
Sept 2024: Repair WO tbg leak, csg leak, squeeze annulus new AS1-X pkr ran.

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

Operator: SOLARIS WATER MIDSTREAM, LLC 9651 Katy Fwy Houston, TX 77024	OGRID: 371643
	Action Number: 387162
	Action Type: [C-103] Sub. Workover (C-103R)

CONDITIONS

Created By	Condition	Condition Date
mgebremichael	None	10/23/2024