

IPL-583

DATE <u>10.20.10</u>	SUSPENSE	ENGINEER <u>TW</u>	LOGGED IN <u>10.20.10</u>	TYPE <u>IPI</u>	APP NO. <u>1029351448</u>
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ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION

- Engineering Bureau -

1220 South St. Francis Drive, Santa Fe, NM 87505



Resaca

Cooperated Unit #134

ADMINISTRATIVE APPLICATION CHECKLIST

30-025-09644

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

lea

[1] TYPE OF APPLICATION - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☐ SWD ☒ IPI ☐ EOR ☐ PPR

[D] Other: Specify _____

[2] NOTIFICATION REQUIRED TO: - Check Those Which Apply, or **Does Not Apply**

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☐ Offset Operators, Leaseholders or Surface Owner

[C] ☐ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

R-4019

[3] SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.

[4] CERTIFICATION: I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

KEITH B. MASTERS, P.E.
Print or Type Name

(Keith B. Masters, P.E.)
Signature

Consultant
Title

10/16/10
Date

k-b-masters@mastersconsultingllc.com
e-mail Address

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7500 Rialto Blvd.; Ste. 180

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Keith B. Masters, P.E.
President

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RECEIVED
Phone: (512) 906-2016
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October 16, 2010

2010 OCT 18 P 1:44

Mr. Terry G. Warnell
New Mexico Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

Re: Injection Pressure Increase
Resaca Operating Company
Cooper Jal Unit
Lea County, NM

CTU # 134
30-025-09644
3031-3570

Dear Terry:

Resaca Operating Company ("Resaca") hereby requests an increase in the authorized surface injection pressure for one well within the Cooper Jal Unit ("the Unit"), Lea County, New Mexico.

By Order No. R-4018, dated August 25, 1970, the NMOCD approved the Cooper Jal Unit Agreement. A waterflood project in the Langlie-Mattix Pool underlying the Unit was approved by NMOCD Order R-4019. A waterflood project in the Jalmat Pool underlying the Unit was approved by NMOCD Order R-4020. Water injection was authorized by these orders and by Administrative Orders WFX-648, WFX-657, and WFX-671.

Twenty-eight injection wells and sixty-eight producing wells are currently active. By Administrative Order IPI-380, dated October 12, 2010, eight injection wells were granted increased injection pressure authority. Most of the producing wells have been granted authority for down-hole commingling of the Langlie-Mattix and the Jalmat Pools, and under current operations the Unit is effectively operated as a single waterflood project.

Plans are being formulated to perform tertiary recovery operations within the Unit, which will involve injection of CO₂. Consistent therewith, it is necessary to increase reservoir pressure to achieve miscibility. This application will facilitate an increased injection rate which is necessary to prepare the reservoir for tertiary recovery operations.

A step rate test has been run in the Cooper Jal Unit #134. The enclosed table entitled "Current & Proposed Maximum Surface Injection Pressures" summarizes results of this step rate test, and lists the proposed maximum surface injection pressure. Back-up data in the form of a

Mr. Terry G. Warnell

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well-bore diagram (provided by Resaca) and the empirical data recorded during the step-rate test (provided by Gray) are attached for your reference.

Thank you for your assistance with regard to this application. Resaca respectfully requests that it be expedited to the extent possible. Please direct any inquiries regarding this matter to the undersigned.

Sincerely,

A handwritten signature in black ink, appearing to read "Keith B. Masters".

Keith B. Masters, P.E.
for Resaca Operating Company

cc: Resaca Operating Company

CURRENT & PROPOSED MAXIMUM SURFACE INJECTION PRESSURES
RESACA OPERATING COMPANY
COOPER JAL UNIT

Well No.	API No.	NMOCD Order No. Authorizing Injection	Current Maximum Surface Injection Pressure (psig)	Depth of Top Perforation (ft)	Surface Parting Pressure * (psig)	Surface Parting Pressure ** (psig/ft)	Proposed Maximum Surface Injection Pressure (psig)
134	30-025-09644	WFX-657	606	3,031	881	0.291	830

* - This value was determined by extrapolation based on the observed Bottomhole Parting Pressure, and will therefore differ from the pressure shown on the Contractor's plot of surface pressure data.

** - Surface Parting Pressure / Depth of Top Perforation

WELLBORE SCHEMATIC AND HISTORY

CURRENT COMPLETION SCHEMATIC

Surface Csg.

Hole Size: 11 in
Csg. Size: 8 5/8 in
Set @: 280 ft
Sxs Cmt: 150
Circ: Yes
TOC @: surf
TOC by: circ

Production Csg.

Hole Size: 7 7/8 in
Csg. Size: 5 1/2 in
Set @: 3462 ft
Sxs Cmt: 300
Circ: No
TOC @: 1880 f / surf.
TOC by: calc.

TOC @ 1880'
By Calc.

pkf @ 2959'

Jalmat

3031'
3034'
3037'
3040'
3042'
3053'
3057'

3223'
3225'
3227'

3291'
3293'
3295'

Langlie Mattix

OH Interval
3462 - 3570'

Fill at 3508'

PBTD: 3570 ft
TD: 3570 ft

OH ID: 4 3/4 in

Cooper Jal Unit

WELL NO. 134 WIW

LEASE NAME

STATUS:

Active

Water Injector

API#

30-025-09844

LOCATION:

330 FSL & 1650 FWL, Sec 24, T - 24S, R - 38E, Lee County, New Mexico

SPUD DATE:

TD

3570

KB

3,321'

DF

INT. COMP. DATE:

07/18/54

PBTD

3570

GL

3,310'

GEOLOGICAL DATA

ELECTRIC LOGS:

GR-N from surface - 3570' (7-17-54 Schlumberger)
Injection Profile (1-25-97 Houston, Inc.)
GR-N (2-7-79 Dresser Atlas)

CORES, DST'S or MUD LOGS:

HYDROCARBON BEARING ZONE DEPTH TOPS:

CASING PROFILE

SURF. 8 5/8" - 280', J-55 set @ 280' Cmt'd w/150 sxs - circ cmt to surf.

PROD. 5 1/2" - 140' (Surface - 2975') & 170' (2250 - 3462'), J-55 set @ 3462' Cmt'd w/300 sxs - TOC @ 1880' from surf by calc.

LINER None

CURRENT PERFORATION DATA

CSG. PERFS:

3031', 34', 37', 40', 42', 53', 57', 3223', 25', 27', 91',
93', & 3295' w/1 spf (30 holes total - .32" dia.)

OPEN HOLE:

3462 - 3570'

TUBING DETAIL

8/9/1994

ROD DETAIL

Length (ft)

Detail

11.00 KB
2945.00 98 jts - 2 3/8" 4.7#, CL, J-55, 8rd EUE tbg.
3.00 1- 5 1/2" x 2 3/8" Baker Model AD-1 packer
2959.00 btm

WELL HISTORY SUMMARY

18-Jul-54 Initial completion interval: 3462 - 3570' (Lower 7-Rivers OH). Frac'd w/5,000 gals lse oil & 7,500 #s sand.

IP= 237 bopd, 0 bwppd, & 320 Mcfppd (flowing)

07-Nov-75 C/O to 3570'. Acidz'd w/ 1,500 gals.

15-Mar-79 Tagged btm - No fill. Logged well. Perf'd (Jalmat) 3031', 34', 37', 40', 42', 53', 57', 3223', 25', 27', 91', 93', & 3295'

w/1 spf (30 holes total -.32" dia.) Acidz perfs (3031 - 3295) w/3,000 gals; Frac w/49,000 gals X-L gel, 36,000#s 20/40 sand & 13,500 gals 10/20 sand in 3 equal stages using rock salt for diversion. Max sand concentration was 2 ppg. C/O to 3570'.

11-Oct-82 C/O OH from 3469 - 3570' (101' of fill). Frac OH w/13,000 gals X-L gel, 6,000 gals CO₂, 23,500#s 20/40 sand, 13,500#s 10/20 sand with max sand concentration of 3 ppg and max rate of 9.5 bpm. C/O OH to 3570'.

20-May-87 Tag fill @ 3521' (49' of fill). Did not C/O.

21-Jan-89 C/O fill from 3521 - 3570' (49' of fill). After WO: 19.9 bopd, 90 bwppd, & 17.9 Mcfppd

15-Apr-94 Converted well to DHC (Jalmat & Langlie Mattix) injector: C/O scale & formation from 3524 - 70'. Jet wash 3570 -

3462'. Acidz OH w/4,200 gals 20% NEFE HCL mixed with 165 gals micellar solvent diverting with 1700#s rock salt in 4 stages.

Tried to isolate perfs 3031 - 3295 w/ RBP @ 3306' & pkf @ 3303'. No test on tools. POOH w/tools and acidz'd perfs 3031 - 3295 and OH (3462 - 3570') together using 4,200 gals 20% NEFE HCL mixed with 165 gals micellar solvent diverting with 2100#s rock salt in 4 stages. AIR=3.1 bpm, ISIP=500 psi, P15min=vacuum. RIH w/pkr on 2 3/8" CL tbg. Could not set pkf @ 2990'.

Set pkf @ 2959'. Test OK. Initiated injection @ 712 bwppd @ 425 psi.

14-Feb-02 Tag TD using SL unit (1 1/4" x 5' sinker bar). Tag fill @ 3508' (62' of fill)

PREPARED BY:

Larry S. Adams

D. Camzales

UPDATED:

20-May-04



STEP RATE TESTS

monty.holmes@graywireline.com

RATE BPD	Date	Time	BH Press	SURF Press	Comments
0	9/27/2010	11:07 AM	2177	670	OIL AT SURF
100	9/27/2010	11:45 AM	2247.5	810	
200	9/27/2010	12:15 PM	2289.7	850	
300	9/27/2010	12:45 PM	2326.6	890	
400	9/27/2010	1:15 PM	2356.8	930	
500	9/27/2010	1:45 PM	2384.9	970	
Company: RESACA OPERATING				Recorded By:	MONTY HOLMES
Well: COOPER JAL UNIT #134				Witnessed By:	RICHIE JOURNEYAY
Field: COOPER JAL				Truck Number:	85
County: LEA				District:	ODESSA
State: NEW MEXICO				Tool Number:	SPARTEK SRO
Fluid Type: WATER				Test Type:	STEP RATE TEST
Shut-in Time: SEVERAL DAYS				NOTES: FRAC POINT AT -2305-BH PSI, 2318 -870-SF PSI 881	
Tool Depth 3400'					
Tubing Size: 2 3/8" IPC TBG					
Tail Pipe Depth: 2959'					
Perfs: 3030'-3295' OPEN HOLE: 3462'-3570					
Plug Back Depth FILL @ 3558'					



GWSi

880
50
830

RATE VS PRESSURE

