

Para et al Liard I-46 60 10 123 15

WID 1871

Report on Well Abandonment Operations

20170307 – 20170310

## Executive Summary

The Para et al Fort Liard I-46 well, was initially completed as a Mattson and subsequently a Chinkeh sweet gas well, but after testing, was deemed uneconomic and was never put on production. It was decided to abandon the I-46 well, along with another well that had never been placed on production (A-01) and three other former producing wells (F-36, O-35 and N-01). The required land use permit and water license were obtained, and requests for Approval to Alter the Condition of a Well we made to abandon all five wells.

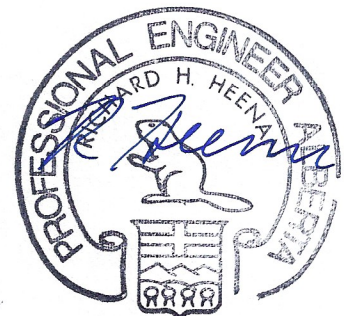
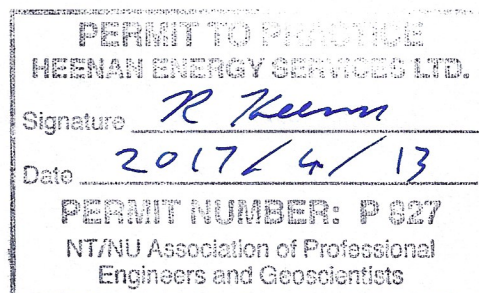
The Chinkeh and Mattson zones had been abandoned in 2009 by setting bridge plugs and capping them with cement. The well was circulated to inhibited water, as required at the time and a bridge plug set at 50 meters in anticipation of a future surface abandonment. As of February 1, 2017, these methods we not considered acceptable and the approved ACW required that the top bridge plug be drilled out and the well circulated to fresh water.

A check of the surface casing vent on 20170201 indicated "no bubbles" in 10 minutes (consistent with previous shut-in well inspections).

The Savanna service rig was moved in and BOPs installed and tested without incident. The bridge plug was milled up and pushed to bottom at 1204mKB. The well was circulated to fresh water. The casing, bridge plug at 1210mKB, and the cement cap were pressure tested to 7 MPa.

A final 10 minute bubble test on the surface casing vent on 20170310 showed "no bubbles". Surface and production casing were cut 1.1 meter below ground level and steel caps stitch welded (non-sealing) on the casing stubs. The hole around the casing was back filled to grade with the original excavated material. A well sign was installed 1 meter north of the casing stub.

A Change of Well Status Form was submitted 20170311.



The following are attached to this report

Wellbore Diagrams

As abandoned

Prior to operations

Daily Completion Reports – 20170307 - 20170310

Change of Well Status Form

# PARAMOUNT ET AL FT. LIARD I-46

60deg 10' N, 123deg 15' W

As Abandoned

KB 542.5m

GL 537.5

Non-sealing steel plate  
1m north of well  
1.5m high - set in cement

WellSign

Cut 1m below ground

50m

505m

Bridge plug drilled out  
& pushed to PBTD

Cement plug

1204m

1204-1210mKB  
1210mKB

Chinkeh Perforations

1217-1222mKB

Baker CMS liner hanger  
P-test to 14MPa X 15 min  
20090208

1504mKB

1545mKB

6m cement plug  
Weatherford perm'nt Bridge Plug

1598-1604mKB  
1604mKB

Mattson Perforations

1618-1619m

Spent TCP guns

8m cement plug  
Baker 'S' premanent BP

1625-1633m  
1633m

Mattson Perforations

1635-1645m

Spent TCP guns

2044m  
2055m

244.5 mm, 53.57 kg/m  
J-55 LT&C  
30T O:1:0 - Cement to surf.  
Cement to surface

177.8 mm, 38.69 kg/m  
J-55 LT&C  
13t 1:1:2 & 11t 0:1:0 'G'  
2m3 of 3m3 flush  
Calc cmt top = 65mKB

114.3 mm, 17.36 kg/m  
J-55 LT&C  
9t 0:1:0 'G'  
Backwash 1m3 cmt returns

# PARAMOUNT ET AL FT. LIARD I-46

60deg 10' N, 123deg 15' W

Current configuration - 20090222

KB 542.5m

GL 537.5

Permanent bridge plug

50mKB

244.5 mm, 53.57 kg/m  
J-55 LT&C  
30T O:1:0  
Cement to surface

6m cement plug

1204-1210mKB  
1210mKB

177.8 mm, 38.69 kg/m  
J-55 LT&C  
13t 1:1:2 & 11t 0:1:0 'G'  
2m3 of 3m3 flush  
Calc cmt top = 65mKB

Chinkeh Perforations

1217-1222mKB

Baker CMS liner hanger  
P-test to 14MPa X 15 min  
20090208

1504mKB

1545mKB

114.3 mm, 17.36 kg/m  
J-55 LT&C  
9t 0:1:0 'G'  
Backwash 1m3 cmt returns

6m cement plug  
Weatherford perm'nt Bridge Plug

1598-1604mKB  
1604mKB

Mattson Perforations

1618-1619m

Spent TCP guns

8m cement plug  
Baker 'S' premanent BP

1625-1633m  
1633m

Mattson Perforations

1635-1645m

Spent TCP guns

2044m  
2055m





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## Daily Completion and Workover

PARA ET AL FT LIARD I-46

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Report Date: 2017-03-07  
Report # 1.0

Total AFE Amount: 233,936.00  
AFE Number: 17N770028  
Daily Cost Total: 44,502  
Cum Cost to Date: 44,502

API/UWI 300I46601012315	Surface Legal Location 300/I-46-6010-123152	Field Name Liard	License # 0003060
Well Configuration Type Vertical	Casing Flange Elevation (m)	Ground Elevation (m) 537.50	Original KB Elevation (m) 542.50
Last Casing String		PBTD (All) (mKB)	

Objective  
Abandon well

Operation at 6am

Heat BOP's and kill fluids

Operations Summary

MIRU service rig and equipment; P/T and installed BOP's; tallied and ran mill BHA; tagged at 48.18 mKB; installed pack-off head.

Operations Next Report Period

Mill up bridge plug and push to bottom.

Road Condition

Ice/Snow

Weather

Clear

Report Start Date

2017-03-07

Report End Date

2017-03-07

Head Count

Personnel Total Hours (hr)

Cum Personnel Total Hours (hr)

### Daily Contacts

Title	Job Contact	Mobile
Operations Manager	Patrick Kelly, Operations Manager	403-519-1780
Consultant	Dick Heenan, Consultant	403-818-4408
Consultant	Terry Pollard, Consultant	780-361-5962
Rig Manager	Craig Hewlett, Rig Manager	780-278-0263

### Time Log

Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
07:00	07:30	0.50	SMTG	Safety Meeting	Held safety meeting with all personnel discussing chaining up equipment; winter driving; spotting and rigging up equipment; overhead lifts; two men carrying line pipe; lease and lease road hazards. Completed Safe Work Agreement and Field Risk Assessment forms.
07:30	08:30	1.00	RMOV	Rig Move	Moved Savanna service rig and equipment from 300/O-35-6010-12315 to location.
08:30	11:00	2.50	SRIG	Rig Up/Down	Spotted and rigged up Savanna service rig #126; pump and tank to Paramount Resources; OH&S; Northwest Territories and OROGO regulations. Note rig tank; boiler and 400 bbl tanks placed on rig matting.
11:00	12:00	1.00	DFIT	Record well pressures	Rigged in the boiler and lines; put steam heat on the BOP's and wellhead. Check the wellhead pressure and observed the well dead.
12:00	13:00	1.00	BOPT	Pressure Test BOP's	Stump tested the class III BOP's blind rams and 60 mm pipe rams to 1400 kPa and 21,000 kPa for 10 minutes each and the annular preventors to 1400 kPa and 10,000 kPa for 10 minutes each.
13:00	14:00	1.00	BOPI	Install BOP's	Removed the wellhead top section and installed the class III BOP's.
14:00	15:00	1.00	RMOV	Rig Move	Cooper Barging moved in and spotted the catwalk; pipe racks and 60 mm work string.
15:00	16:30	1.50	Job Prep	JOB PREP	Tallied and ran 154 mm 5 bladed junk mill; 89 mm Reg x 79 mm IF bit sub; 5 - 79 mm IF drill collars and tagged solid at 48.18 mKB; pulled and laid down 1 - 79 mm drill collar; installed a 79 mm IF pin x 73 mm box crossover; 73 mm EUE pin x 60 mm EUE box crossover and 1 - 3.08 m x 60 mm 6.99 kg/m J-55 EUE pup joint. Installed the pack-off head onto the annular preventors.
16:30	17:00	0.50	CLLS	Clean & Secure Lease	Shut in and secured the well for night. Boiler man heating BOP's and fluids overnight.

### Report Fluids Summary

Fluid	To well (bbl)	From well (bbl)	Cum from Well (bbl)	Left to recover (bbl)

### Perforations

Time	Linked Zone	Top (mKB)	Btm (mKB)	Current Status

### Tubing Components

Item Des	Top (mKB)

### Casing Strings

Csg Des	Grade	W/Len (lb/ft)	Set Depth (mKB)





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## Daily Completion and Workover

PARA ET AL FT LIARD I-46

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Report Date: 2017-03-08  
Report # 2.0

Total AFE Amount: 233,936.00  
AFE Number: 17N770028  
Daily Cost Total: 31,383  
Cum Cost to Date: 75,885

API/UWI 300I46601012315	Surface Legal Location 300/I-46-6010-123152	Field Name Liard	License # 0003060
Well Configuration Type Vertical	Casing Flange Elevation (m)	Ground Elevation (m) 537.50	Original KB Elevation (m) 542.50
Last Casing String		PBTD (All) (mKB)	

Objective  
Abandon well

Operation at 6am  
Heat BOP's and fluids

Operations Summary  
Milled up the bridge plug and pushed to PBTD; circulated the wellbore to fresh water; pressure tested the casing; cement top and bridge plug to 7.0 MPa.

Operations Next Report Period  
POOH with tubing and mill BHA; remove the BOP's and rig out rig and equipment.

Road Condition Ice/Snow	Weather Clear	Report Start Date 2017-03-08	Report End Date 2017-03-08
Head Count	Personnel Total Hours (hr)	Cum Personnel Total Hours (hr)	

### Daily Contacts

Title	Job Contact	Mobile
Operations Manager	Patrick Kelly, Operations Manager	403-519-1780
Consultant	Dick Heenan, Consultant	403-818-4408
Consultant	Terry Pollard, Consultant	780-361-5962
Rig Manager	Craig Hewlett, Rig Manager	780-278-0263

### Time Log

Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
07:00	07:30	0.50	SMTG	Safety Meeting	Held safety meeting with all personnel discussing cold weather; possible frost bite; rigging in power swivel; circulating; high pressure; steam heating and tripping tubing hazards.
07:30	13:00	5.50	Tub Drill	Drill out with Tubing	Conducted a 15 minute bubble test on the surface casing vent and observed no bubbles. Installed the power swivel onto the 60 mm tubing; broke circulation at 0.32 m <sup>3</sup> / minute with 500 kPa; tagged the top of the bridge plug at 48.18 mKB; milled on the bridge plug from 48.18 mKB to 48.90 mKB with 1,000 daN to 2,000 daN weight on mill rotating at 110 rpm; observed the bridge plug start to move. Circulated until clean returns were observed. Laid down the power swivel and removed the pack-off head.
13:00	15:00	2.00	RUTB	Run Tubing	Tallied; drifted and ran 120 joints of 60 mm 6.99 kg/m J-55 EUE tubing and tagged solid at 1203.8 mKB.
15:00	16:30	1.50	Circulate	Circulated	Circulated the wellbore to fresh water. Shut in the returns and pressure tested the cement top; bridge plug and casing to 7.0 MPa for 10 minutes - held solid. Bled off the pressure.
16:30	17:00	0.50	PULT	Pull Tubing	Pulled and laid down 15 joints of 60 mm 6.99 kg/m J-55 EUE tubing. Shut in and secured the well for night. Boiler man to heat BOP's and fluids overnight.

### Report Fluids Summary

Fluid	To well (bbl)	From well (bbl)	Cum from Well (bbl)	Left to recover (bbl)

### Perforations

Time	Linked Zone	Top (mKB)	Btm (mKB)	Current Status

### Tubing Components

Item Des	Top (mKB)

### Casing Strings

Csg Des	Grade	Wt/Len (lb/ft)	Set Depth (mKB)





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## Daily Completion and Workover

PARA ET AL FT LIARD I-46

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Report Date: 2017-03-09  
Report # 3.0

Total AFE Amount: 233,936.00  
AFE Number: 17N770028  
Daily Cost Total: 79,115  
Cum Cost to Date: 155,000

API/UWI 300I46601012315	Surface Legal Location 300/I-46-6010-123152	Field Name Liard	License # 0003060
Well Configuration Type Vertical	Casing Flange Elevation (m)	Ground Elevation (m) 537.50	Original KB Elevation (m) 542.50
Last Casing String		PBTD (All) (mKB)	

Objective  
Abandon well

Operation at 6am

Well ready to cut and cap

Operations Summary

POOH laying down work string and BHA. Removed the class III BOP's; placed cap on casing bowl. Rigged out and released Savanna service rig and equipment.

Operations Next Report Period

Cut and cap wellhead and casings.

Road Condition

Ice/Snow

Weather

Clear

Report Start Date

2017-03-09

Report End Date

2017-03-09

Head Count

Personnel Total Hours (hr)

Cum Personnel Total Hours (hr)

### Daily Contacts

Title	Job Contact	Mobile
Operations Manager	Patrick Kelly, Operations Manager	403-519-1780
Consultant	Dick Heenan, Consultant	403-818-4408
Consultant	Terry Pollard, Consultant	780-361-5962
Rig Manager	Craig Hewlett, Rig Manager	780-278-0263

### Time Log

Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
07:00	07:30	0.50	SMTG	Safety Meeting	Held safety meeting with all personnel discussing cold weather; laying down tubing and drill collars; BOP removal; rigging out and winter driving hazards.
07:30	11:00	3.50	PULT	Pull Tubing	Pulled and laid down 105 joints of 60 mm 6.99 kg/m J-55 EUE tubing; 60 mm EUE x 73 mm EUE crossover; 73 mm EUE x 79 mm IF crossover; 4 - 79 mm IF drill collars; 79 mm IF x 89 mm Reg bit sub and 154 mm mill. Observed the face of the mill worn smooth and the mill in-gauge.
11:00	12:00	1.00	BOPR	Remove BOP's	Rigged out the work floor and removed the class III BOP's. Placed a cap on the casing bowl.
12:00	14:30	2.50	SRIG	Rig Up/Down	Rigged out Savanna service rig; boiler; pump and tank.
14:30	15:30	1.00	CLLS	Clean & Secure Lease	Cooper Barge loaded up tubing, catwalk, pipe racks; 2 - 60 m <sup>3</sup> tanks; boiler; fuel skid; rig matting and one light tower and returned equipment to Ft. Nelson. Cleaned up and secured the lease.

### Report Fluids Summary

Fluid	To well (bbl)	From well (bbl)	Cum from Well (bbl)	Left to recover (bbl)

### Perforations

Time	Linked Zone	Top (mKB)	Btm (mKB)	Current Status

### Tubing Components

Item Des	Top (mKB)

### Casing Strings

Csg Des	Grade	Wt/Len (lb/ft)	Set Depth (mKB)





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## Daily Completion and Workover

PARA ET AL FT LIARD I-46

Rig: Savanna Well Service

Business Unit: NORTHERN COU

Report Date: 2017-03-10  
Report # 4.0

Total AFE Amount: 233,936.00  
AFE Number: 17N770028  
Daily Cost Total: 20,980  
Cum Cost to Date: 180,120

API/UWI 300I46601012315	Surface Legal Location 300/I-46-6010-123152	Field Name Liard	License # 0003060
Well Configuration Type Vertical	Casing Flange Elevation (m)	Ground Elevation (m) 537.50	Original KB Elevation (m) 542.50
Last Casing String		PBTD (All) (mKB)	

Objective

Abandon well

Operation at 6am

### Operations Summary

Dug bell hole around the well head; cut off the wellhead; cut casings 1.1 m below ground level; stitch welded caps on both casing stubs with Liard I-46 welded on the surface casing cap; back-filled the bellhole; removed 9 rig anchors from the lease.

### Operations Next Report Period

Well cut and capped. Final report.

Road Condition Ice/Snow	Weather Clear	Report Start Date 2017-03-10	Report End Date 2017-03-10
Head Count	Personnel Total Hours (hr)	Cum Personnel Total Hours (hr)	

### Daily Contacts

Title	Job Contact	Mobile
Operations Manager	Patrick Kelly, Operations Manager	403-519-1780
Consultant	Dick Heenan, Consultant	403-818-4408
Consultant	Terry Pollard, Consultant	780-361-5962
Rig Manager	Craig Hewlett, Rig Manager	780-278-0263

### Time Log

Start Time	End Time	Dur (hr)	Code 1	Code 2	Com
07:30	08:00	0.50	SMTG	Safety Meeting	Moved in with Zedi back-hoe and welder; held safety meeting with all personnel discussing digging bellhole; cutting off wellhead and casings; welding; overhead lifts and back-filling hazards. Completed Safe Work Agreement and Ground Disturbance Checklist.
08:00	16:00	8.00	Cut and Cap casings	Cut and Cap casings	Performed a 10 minute bubble test on the surface casing vent and observed no bubbles. Back-hoe dug a 1.5 m bell hole around the wellhead / casings; checked the bellhole for LEL's and observed 0% LEL readings; secured the wellhead with the back-hoe; cut three windows in the 244.5 mm surface casing; cut the 177.8 mm casing; then the 244.5 mm casing and removed the wellhead to the edge on the lease. Cut both casings 1.1 m below ground level; stitch welded steel caps on the 177.8 mm casing and 244.5 mm casing and welded I-46 onto the top cap. Back filled the bellhole with dirt in the same order it was removed - installed a well sign 1 meter north of the cut casings ( sign post cemented in a 22 liter pail and buried 1 meter below ground level with 1.6 m above ground level c/w I-46 - 6010 - 123- 15 and to-day's date welded onto the sign ). Dug out and removed 9 rig anchors from inside the lease. Cleaned up the lease.
FINAL REPORT					

### Report Fluids Summary

Fluid	To well (bbl)	From well (bbl)	Cum from Well (bbl)	Left to recover (bbl)

### Perforations

Time	Linked Zone	Top (mKB)	Btm (mKB)	Current Status

### Tubing Components

Item Des	Top (mKB)

### Casing Strings

Csg Des	Grade	W/Len (lb/ft)	Set Depth (mKB)



# Office of the Regulator of Oil and Gas Operations (OROGO)

## Change of Well Status

This form must be filed with the Office of the Regulator of Oil and Gas Operations within 14 days of a change in well status.

### 1. WELL IDENTIFICATION

<b>Well Name</b>	<b>Grid</b>	<b>WID</b>
Paramount Et al Liard I-46	60° 10' N 123° 15' W	1871
<b>Date</b> March 10, 2017	<input type="checkbox"/> First Filing for this Well	<b>Interest Identifier</b>

### 2. WELL LICENSEE / OPERATOR IDENTIFICATION

<b>Filing Company Name</b>	Paramount Resources Ltd		
<b>Contact Name (PRINT)</b>	Pat Kelly		
<b>Telephone No.</b>	(403) 290-3600	<b>Fax No.</b>	
<b>Email</b>	Patrick.Kelly@paramountres.com		

### 3. NEW STATUS INFORMATION

<b>Status Effective Date</b>	<b>Field Code</b>	
Year Month Day	<b>Pool Code</b>	
2017 3 10	<b>Seq Code</b>	
<b>Completion Interval (mKB)</b>	<b>Field Name</b>	Liard
Top 1217.0	<b>Pool Name</b>	Chinkeh
Base 1222.0	Issuance of new pool codes will be made after receipt of this application.	

### 4. WELL TYPE

<input type="checkbox"/> 1 Producer	<input type="checkbox"/> 4 Steam-Assisted Gravity Drain
<input type="checkbox"/> 2 Injection	<input type="checkbox"/> 5 Injection - Drilling Discharge
<input type="checkbox"/> 3 Observation	<input checked="" type="checkbox"/> 6 Other Uneconomic - well was tested but never placed on production

### 5. WELL FLUID PRODUCTION

<input type="checkbox"/> 0 Not Applicable	<input type="checkbox"/> 5 Acid Gas	<input type="checkbox"/> 10 Nitrogen
<input type="checkbox"/> 1 Crude Oil	<input type="checkbox"/> 6 Solvent	<input type="checkbox"/> 11 Liquefied Petroleum Gas
<input checked="" type="checkbox"/> 2 Gas	<input type="checkbox"/> 7 Steam	<input type="checkbox"/> 12 Bitumen
<input type="checkbox"/> 3 Water	<input type="checkbox"/> 8 Air	
<input type="checkbox"/> 4 Brine	<input type="checkbox"/> 9 Carbon Dioxide	

### 6. WELL MODE

<input type="checkbox"/> 1 Pumping	<input type="checkbox"/> 3 Suspended	<input type="checkbox"/> 5 Shut-in (if > 60 days)
<input type="checkbox"/> 2 Flowing	<input type="checkbox"/> 4 Gas Lift	<input checked="" type="checkbox"/> 6 Abandoned

### 7. OTHER

<input type="checkbox"/> # Other	Details
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