200, 207 9th Avenue S.W.
Calgary , Alberta T2P 1K3
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Abandonment Information Package

Obsidian et al North Liard C-31A

Prepared By: Clive Mountford, P. Eng.
October 28, 2019

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SUPPORTING DOCUMENTS FOR ACW APPLICATION

APPENDICES:

DETAILED WELL REPORT:

Well Name: CDN FOREST ET AL NORTH LIARD C -31A
UWID: 300/C -31 -6040 – 12330/0

Licence #: N1907

A. Drilling

This well was drilled to a total depth of 2941.0mKB in August 4, 2000. It has PBTD of 2255.0mKB in April 3, 2001. Three sidetracks were conducted during the drilling as follows:

- Sidetrack No. 1
  2366.8 mKB (TVD 2361.0mKB) – 2450.0mKB (TVD 2444.1mKB), majorly penetrated shales In Fort Simpson and Horn River formations

- Sidetrack No. 2
  2300.0mKB (TVD 2294.3mKB) -2330.0mKB (TVD 2324.3mKB) majorly penetrated Shales in Fort Simpson formation

- Sidetrack No. 3
  2300.0mKB (TVD 2294.3mKB) -2941.0mKB (TVD 2865.3mKB) majorly penetrated Shales in fort Simpson Horn Rover formations.

These three horizontal sections were fully abandoned with cement plugs due to no reservoir rock being penetrated. No coring and DST were performed.

B. Completion

Vertical section was re-completed from January 15 to February 6, 2002. The well was perforated in the Fort Simpson and Exshaw formations and followed by swab/flow tests. The perforation interval as follows:

Perforation interval	*Formation*	*Status*
1697.0 -1703.0mKB	Exshaw	Current
1762.0 – 1768.0mKB	Exshaw	Current, fracd
1730.0 - 1736.0mKB	Exshaw	Current
1967.0 – 1973.0mKB	Fort Simpson	ABD, fracd twice (BP @1800mKB)

C. Swab and Flow Test Summary

- 1760.0 -01768.0 mKB (Exshaw formation)

  Swab Test (01/24/2002) 9 swabs recovered 7.91m^3 100% water

  Flow Test 901/25-01/31/2002) recovered 32.4m^3 water +116m3 gas

- 1630.0 -1703.0mKB(Exshaw Formation)

  Swab Test (02/07/2002) 23 swabs recovered 30.8m^3 100% water

  Swab Test (02/08/2002) 35 swabs recovered 21.8m^3 100% water

  Swab Test (02/09/2002) 36 swabs recovered 8.6m^3 100% water

  Swab Test (02/10/2002) 12 swabs recovered 1.8m^3 100% water

Please see attached Latest Well Diagram, Well Data and History**.**

Penn West Energy Trust

Well Data and History

August 13, 2008 — C-31A-60-40-123-30 — By: Denis Yang

General Data

Well Name :	CDN FOREST et al North Liard C-31A		
Surface Location:	60°30'00.3158" N	Spud Date :	Aug 04, 2000
	123°36'36.1336" W	Rig Rel Date :	Jan 05, 2001
Bottom Location:	60°30'02.7440" N	License # :	1900
	123°36'30.5449" W	Surf Lse ($/Yr) :	
Well Status :	Completed	KB (m) :	488.0
Zone :	Exshaw	GL (mKB) :	481.3
		MD	2,941.0
		PBTD (mKB) :	2,255.0

Participants

Company	WI (%)

Surface Casing

Aug 10, 2000	15 jts, 508.0mm conductor, 195.0kg/m, 56 @ 190.0mKB Cemented w/ 80.0t 0-1-0 G + 1.0% CaCl2, no cmt returns
Aug 21, 2000	55 jts, 339.7mm casing, 101.0kg/m, K-55 @ 710.3mKB Cemented w/ 105.0t 0-1-0 G + 0.5% CFR + 0.3% LTR, 11.0 m3 good cmt returns

Production Casing

Dec 20, 2000	189 jts, 244.5mm casing, 80.0kg/m, HCL-80, BT&C @ 2629.6mKB Cemented w/ 20.0t 0-1-0 G + 0.75% CFR + 0.4% CFL-1 + 0.2% LTR, filled w/ 30.0t Thermal 40 + 1.0% CFR + 0.35% CFL-H + 0.15% HTR-2 with 6L FA-1/m3, tailed in w/ 53.0t Thermal 40 + 0.7% CFR + 0.7% CFL-2 + 0.2% LTR. Calculated cmt top @ 1100.0mKB

DSTs

	None

Perforations

Date	Depth (mKB) From	To	Status	Comments
Feb 06, 2002	1,697.0	1,703.0	Current	7sh/m, Exshaw
Feb 06, 2002	1,698.0	1,702.0	Current	7sh/m, Exshaw
Feb 06, 2002	1,730.0	1,736.0	Current	7sh/m, Exshaw
Jan 27, 2002	1,762.0	1,768.0	Fractured	w/ 35.0 t of 20/40 sand
Jan 25, 2002	1,762.0	1,765.0	Current	7sh/m, Exshaw
Jan 25, 2002	1,764.0	1,768.0	Current	7sh/m, Exshaw
Jan 24, 2002	1,800.0	1,800.0	Bridge plug	Schlumberger's WR plug capped with sand
Jan 17, 2002	1,967.0	1,973.0	Fractured	w/ 35.0 t of 20/40 sand
Jan 17, 2002	1,967.5	1,972.5	Suspended	7sh/m, re-perforated, Fort Simpson
Jan 15, 2002	1,967.0	1,973.0	Fractured	w/ 35.0 t of 20/40 sand
Jan 15, 2002	1,967.0	1,973.0	Suspended	7sh/m, Fort Simpson

Production String Details

Feb 11, 2002	1-PX plug in XN nipple, 1-244.5mm x 88.9mm tubing hanger, 1-88.9mm x 60.3mm XO, 1 jt-60.3mm x 9.5m tubing, 1-60.3mm x 3.0m pup, 182 jts-60.3mm tubing(1740.9m), 7.0kg/m, J55, EUE, 1-60.3mm XN nipple c/w 47.8mm profile & 45.4mm no/go @ 1759.3mKB, 1jt-60.3mm x 9.6m tubing, 1-sawtooth collar, Tubing bottom @1769.3mKB

Rod String Details

	None

Report Date : Jul 23, 2007 1:54 PM — Page 1 of 2

Penn West Energy Trust

Well Data and History

August 13, 2008

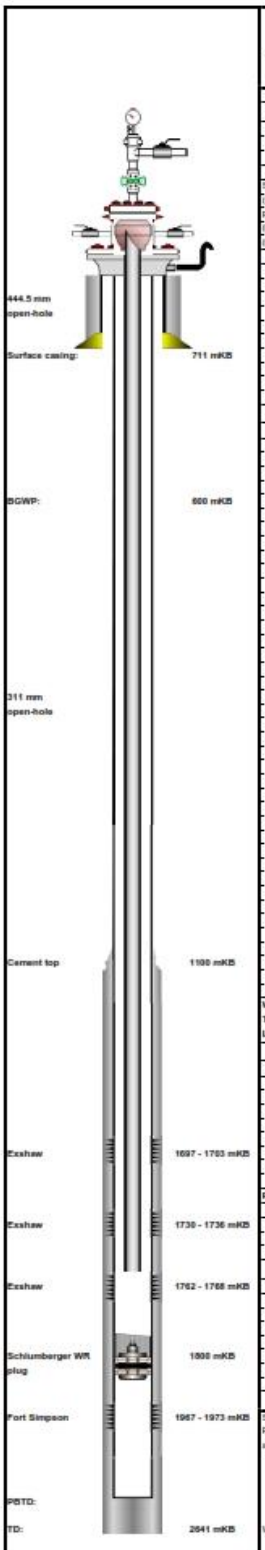
C-31A-60-40-123-30

By: Denis Yang

Well History

Feb 06, 2002	Perforated Exshaw 1730.0~1736.0mKB, 1697.0~1703.0mKB, 1698.0~1702.0mKB @ 7sh/m w/101mm ERHSC, 60 dgree phasing, 23 gram charges. Swab test till Feb 11(see attached test data).
Jan 25, 2002	Perforated Exshaw 1762.0~11765.0mKB, 1764.0~1768.0mKB @ 7sh/m w/101mm ERHSC, 60 dgree phasing, 23 gram charges. Fracd w/ 35.0t of 20/40 sand.
Jan 24, 2002	Suspended Fort Simpson perforations: set Schlumberger WR plug at 1800.0mKB and capped with sand.
Jan 22, 2002	Static Gradient:BHP=2896.5kPa @ MPP 1970.0mKB, BHT=106°C, fluid level @ 1850mKB.
Jan 17, 2002	Re-perforated Fort Simpson 1967.5~1972.5mKB @ 7sh/m w/101mm ERHSC, 60 dgree phasing, 23 gram charges. Fracd w/ 35.0t of 20/40 sand. Swab test(see attached test data).
Jan 15, 2002	Perforated Fort Simpson 1967.0~1973.0mKB @ 7sh/m w/101mm ERHSC, 60 dgree phasing, 23 gram charges. Fracd w/ 35.0t of 20/40 sand.
Apr 02, 2001	Ran cement plug #2 2400~2280mKB with 244.5mm cast iron bridge plug at 2370.0mKB. Final cement plug back depth @ 2255.0mKB.
Apr 01, 2001	Ran cement plug #1 2941~2841mKB with 244.5mm cast iron bridge plug at 2622.0mKB.
Mar 30, 2001	Compeletd sidetrack No 3 drilling at TD 2941.0mKB(TVD 2865.3mKB).
Jan 27, 2001	Started sidetrack No 3 drilling at kick-off point 2300.0mKB(TVD 2294.3mKB).
Jan 24, 2001	Compeletd sidetrack No 2 drilling at TD 2330.0mKB(TVD 2324.3mKB), and abandoned.
Jan 12, 2001	Started sidetrack No 2 drilling at kick-off point 2300.0mKB(TVD 2294.3mKB).
Jan 08, 2001	Compeletd sidetrack No 1 drilling at TD 2450.0mKB(TVD 2444.1mKB), and abandoned.
Jan 05, 2001	Started sidetrack No 1 drilling at kick-off point 2366.8mKB (TVD 2361.0mKB).
Dec 20, 2000	Drilled to 2629.6mKB. Ran and cemented 244.5mm casing @ 2629.6mKB.
Aug 21, 2000	Ran and cemented 339.7mm casing @ 710.3mKB.
Aug 04, 2000	Spud.

EXISTING WELL DIAGRAM:



WELLBORE PROFILE

Orphan Well Association on behalf of Obsidian Energy LTD.

CDN Forest et al North Liard C-31A

BARLON ENGINEERING

UWI:	300/C-31-60-40-123S0	Licence:		DATE:	October 29, 2019

ELEVATIONS (meters)

TMD	2641.00	KB ELEV	488.00	KB TO SCF	5.90
TVD	2641.00	GL ELEV	481.30	KB TO THF	5.34
PBTD	2255.00	KB - GL	6.70	Well Status	

CASING DESCRIPTION & GRADE	OD (mm)	WEIGHT (kg/m)	TOP LOCATION	LANDED DEPTH (m)
Surface casing: K-55	339.7	101.0	Surface	711.00
(11 m3 of cement returns to surface)				
Production casing: L-80	244.5	79.5	Surface	2630.00
(No mention of cement returns to surface)				
(Cement top calculated at 1100 mKB)				

Perf Date	Zones	Top Shot	Bottom Shot	Status	Gun Data
	Exshaw	1697.00	1702.00	Open	7 SPM
	Exshaw	1730.00	1736.00	Open	7 SPM
	Exshaw	1762.00	1766.00	Open	7 SPM
	Fort Simpson	1967.00	1973.00	Suspended	7 SPM

DOWNHOLE DESCRIPTION FROM BOTTOM UP (Tubing String)

ITEM #	DESCRIPTION	LENGTH (m)	TOP OF (mKB)
1	Sawtooth collar	0.10	1769.16
2	60.3 mm, J-55, EUE, 6.99 kg/m tubing joint	9.50	1759.60
3	60.3 mm "XN" nipple o/w 47.6 mm profile, 45.4 mm no/go	0.51	1759.09
4	60.3 x 60.3 mm, J-55, EUE, 6.99 kg/m tubing joints	1745.92	13.37
5	60.3 mm, J-55, EUE, 6.99 kg/m pup joint	3.04	10.33
6	60.3 mm, J-55, EUE, 6.99 kg/m tubing joint	9.54	5.79
7	88.9 mm x 60.3 mm crossover	0.10	5.69
8	244.5 x 88.9 mm tubing hanger	5.35	5.34

WEIGHT OF TUBING STRING (daN)		TOTAL STRING LENGTH	1763.92
TENSION/COMPRESSION (+/- daN)		STRETCH/SLACKOFF (+/- m)	
LANDED STRING WEIGHT (daN)		TUBING BOTTOM (mKB)	1769.26

DOWNHOLE DESCRIPTION FROM BOTTOM UP (Rod String)

AMOUNT	DESCRIPTION	LENGTH (m)	TOTAL (m)

POLISH ROD STICK-UP (m)		TOTAL ROD STRING LENGTH	

PUMP DESCRIPTION	PUMPJACK DESCRIPTION

WELLHEAD DESCRIPTION

ITEM #	DESCRIPTION	SERIAL #	MWP (MPa)	SIZE (mm)

REMARKS

Surface casing cement: 80 m3 1901 kg/m3 + cellophane in the first 40 m3 with 11 m3 of good cement returns
Production casing cement: 20 Tonnes scavenger, 30 tonnes fill, 53 tonnes tail. No cement returns. Cement top calculated at 1100 mKB.

Well status changes:

Prepared by: JS / CM

ABANDONMENT PROGRAM

OBSIDIAN ET AL NORTH LIARD C – 31A

Wellbore Abandonment Program

Original

WID : 1907

Bottomhole Location: 300/C -31 – 6040 -12330

Surface Location: C-41-6030-12330

NON-CONFIDENTIAL

AFE # TBA

Obsidian Energy

200, 207 - 9 Avenue S.W.

Calgary, Alberta T2P 1K3

Phone: (403) 777 - 2500

Fax: (403) 777 - 2699

OBJECTIVE

The subject location is a gas well abandonment.

This well was originally drilled in 2000 to TD of 2941.0mKB and measured depth of 2730 mKB and was originally completed in the Nahanni formation as a gas producer. Three sidetracks were conducted during drilling and were fully abandoned with cement plugs. Vertical section was re-completed from Jan.11 to Feb. 10, 2002. It was perforated in the Fort Simpson from 1967.0 – 1973.0mKB in Jan. 15, 2002 and reperforated after 2 days from 1967.5 – 1972.5 mKB and then fractured twice. Retrievable bridge plug was set at 1800 mKB with 1.5m sand on top of it. The well was then perforated in the Exshaw formation from 1762.0 -1768.0mKB; 1730.0 -1736.0 and 1697.0 -1703.0mKB in Feb. 2002. The well was cemented to surface and no surface casing vent flow exists.

A service rig will be brought to location to pull the tubing and release WR plug. Two cement retainer squeezes will be completed in two different formations with existing open perforations. Utilizing Alberta's ERCB Directive 20 (Well Abandonment), the cement retainer will be set @1963mKB and1690mKB respectively, pressure tested to 7MPa for 10 minutes and capped with 8m class 'G' cement. A permanent bridge plug will be set on top of cemented retainer sitting @ 1690mKB. Bridge plug will be pressure tested to 7Mpa and capped with 8m class G cement. The well will then be cut and capped. The above procedure will be performed to provide isolation of gas bearing zone, discrete pressure zones and prevent any formation fluid from flowing through or escaping from the wellbore (Canada Oil and Gas Drilling and Production Regulations -SOR/2009-315)

II WELL DATA

Well Name: CDN FOREST ET AL NORTH LIARD C-31

License Number:	N1900	**U.W.I.:**	300/C-31-6040-12330
License Date:	July, 14, 2000	**Lahee Class:**	EXP
Spud Date:	Aug. 4, 2000	**Rig Released:**	Jan. 05, 2001
AFE Number:		**Working Interest:**	100%
AFE Amount:		**Main Hole Mud:**	
Elevations:	**KB:** 488.5m	**GL:** 481.3m	**KB-CF:** 5.9 m
Depths:	**TVD:** 2941.0mKB	**PBTD:** 2255.0mKB	**BGWP:**
	MD: 2730.0m		
ERP: Corporate	**Current Status: Shut In**		
OROGO Level:	**Level II Well**		

III TUBULAR & WELLHEAD DATA

Conductor Casing 1 : set @ 31.7mKB
(914.4mm hole size)

Conductor Casing 2: 15 jts. , 508mm, 195kg/m, grade 56 set @190.0mKB

Cemented w/ 60m3 0-1-0 "G" +1% CaCl2. No cement returns at tank but cement was found at ground level when 762mm pipe was cut off
(660mm hole size)

Surface Casing: 55 jts. , 339.70mm, 101 kg/m, K-55 , BT& C set @ 710.3mKB

Cemented w/ 80.40m3 of 0:1:0 w/0.5 % CFR +0.3% LTR 80m3 Slurry @1901kg/m3 + cellophane to the first 40m3 with 11m3 of good cement returns
(444.50 hole size)

Collapse: 13400 Kpa Burst: 23800 Kpa
Drift I.D.: 311.379 mm Capacity: 0.078100 m^3/m

Intermediate Casing: **143 jts. , 244.50mm, 80kg/m, HCl 80, BT&C, set @ 2629.57m**
Cemented w/ 22.5m3 Thermal 40 +1% CFR, 0.35% CFL-2, + 0.35%CFL-H, 0.15%HTR-2, 6L FA-1 /m3 Tail w/ 37.51m3 Thermal 40 +0.7% CFR, .7%CFL-2 , 0.2% LTR.
Additional Comment: mixed 20 sacks of MICA to the first 20 tonnes of "G" cement. Mixed 10 sacks of mica and 10 sacks of cellophane to the first 20 tonnes of thermal 40. Full returns while cementing. Calculated cement top @ 1100mKB
(311.00 hole size)

Collapse: 46000 Kpa Burst: 55000 Kpa
Drift I.D.: 212.83 mm Capacity: 0.036912 m^3/m

Note: No need to cement squeeze un-cemented interval. Please see Appendix A for the Geologist review report)

Production Casing: **set @ 2730mKB**
(215.9mm hole size)

Tubing String: (Bottom up)
Sawtooth collar
1*60.3mm J-55, EUE, 6.99kg/m joint tubing
60.3mm “XN” nipple c/w 47.6mm profile, 45.4mm nogo
182 * 60.3mm J-55 ,EUE, 6.99kg/m ,tubing
1* 60.3mm J-55 ,EUE, 6.99kg/m , pup joint
1*60.3mm J-55 ,EUE, 6.99kg/m , joint tubing
88.9mm *60.3mm crossover
244.5 * 88.9mm tubing hanger
“PX” plug in “XN” nipple
Tubing bottom landed @ 1769.26mKB

Collapse: 55800 Kpa Burst: 53100 Kpa
Drift I.D.: 48.285 mm Capacity: 0.002017m^3/m

Note: Please see well detailed report for Latest Schematic Diagram

Rod String: none

Other Downhole:

Wellhead: 35 MPa Vetco Gray flanged wellhead

IV RESERVOIR PROPERTIES

Formation: Horn River
Fluid Type: Gas
Status: open hole / Abandoned
Cement: 1) 4.73m3 Thermal 40 + Additives 2) Cement: 7.5m3 Thermal 40 + Additives
Cement Top = 2841mKB Cement top = 2255mKB
Cement Base = 2400 mKB
3) 244.5 mm cast iron Bridge Plug set 2255mKB, pressure tested to 7MPa

Formation: Fort Simpson
Fluid Type: Gas
Status: isolated with Retrievable Bridge Plug set @ 1800mKB
Interval (mKB): 1967.0 -1973.0
Length (m): 6

Formation: Exshaw
Fluid Type: Gas
Status: existing open perforation
Interval (mKB): 1762.0 -1768.0 / 1730.0 – 1736.0 / 1697.0 -1703.0
Length (m): 6/6/6; total: 18

BHP (kPa): 18100 kPa (well file recompletion dated 1/23/2002)
Temperature (°C): 106 well file recompletion dated 1/23/2002)
H_2S / CO_2 (%): 2 / 18 – well file info. dated Oct. 2, 2000 (always check and confirm H2S on location)

V COORDINATES & DIRECTIONS

Coordinates (NAD 83)

Latitude 60.50053° N Longitude 123.61476° W

Directions: as per scouting and construction

VI OBSIDIAN REQUIREMENTS

HEALTH AND SAFETY MANAGEMENT

Obsidian Energy (Obsidian) is committed to protecting, its personnel, property and the public from accidents or incidents resulting from any of its operations. Obsidian shall meet these obligations by providing resources and taking the appropriate measures to protect and promote the health and safety of its employees, and to ensure operations do not adversely affect the environment and the general public.

HEALTH, SAFETY & ENVIRONMENT REQUIREMENTS

The Well site Supervisor will have reviewed the contents & requirements of;

- The Obsidian Policies & Procedures CD*-2008 and completed the required acknowledgements as it applies to all Obsidian well servicing operations.
- The Obsidian Health & Safety Management Policy
- The Obsidian Safely Managing Accidents Reduction Tactics Management System (SMART)
- The Obsidian Wellsite Supervisor "To Do" Checklist & Documentation Requirements*.

GENERAL REQUIREMENTS

The Wellsite Supervisor will;

Conduct operations in accordance with provincial Acts & Regulations (Alberta, BC, Sask. & Manitoba, NWT), industry recommend practices (IRP's), ERCB / OGC / MER & MPB guides & directives/ NEB (National Energy Board) , Canada Oil and Gas Drilling and Production Regulation and Obsidian codes of practice.

Review the contents, requirements and have onsite the following documentation;

The well servicing program & AFE cost estimate for the operations to be undertaken.

◊ The Obsidian Corporate or Site Specific Emergency Response Plan (ERP) & required permits.
Complete a review of the procedures outlined in the ERP with all onsite Supervisors.

◊ The Obsidian Field Operations ERP Guide.

◊ The Enform Well Servicing Blowout Prevention Manual.

◊ The Obsidian Employer/Contractor Basic Safety Orientation Handbook.

OPERATIONAL & REPORTING REQUIREMENTS

The Wellsite Supervisor will;

◊ Complete the required Obsidian notifications.

◊ Complete & report completion of the Obsidian Wellsite Handover Forms

◊ Complete the regulatory (ERCB, OGC, MER & MPB , NEB) notification requirements 24 hours;

1. Prior to the beginning of any well servicing operations.
2. Prior to the beginning of Flaring, Incinerating & venting as per regulatory (ERCB D-060/OGC/SER / NEB)

◊ Complete & post the Obsidian Notice of Supervisor Form

◊ Complete & post an Emergency Response Contact List that includes the STARS registration.

◊ Complete & post a Fire & Explosion Prevention Plan as per ERCB D-030 & IRP 18.

◊ Review and confirm any/all changes in operations with the Well Servicing Coordinator or their alternate.

◊ Complete daily the worker Sign-in/Sign-out form.

◊ Complete & report daily the Obsidian – Hazard Assessment Safe Work Agreement

1. Pre-Job Safety Meeting operations to be undertaken at the beginning of the day & whenever a change in the scope of operations occurs.
2. Review the requirements for the Obsidian - Codes of Practice & Rules.
3. Ensure all onsite personnel are IRP 16 compliant and can make available the required safety & well operations certifications (H_2S Alive, First Aid, WHMIS & TDG etc).
4. Make all onsite personnel aware of their responsibilities should an incident occur as per the ERP.
5. Make it known to all onsite personnel for the requirement to wear & utilize the appropriate personnel protective equipment (PPE) as per Obsidian Standards.
6. Make it known to contractors their responsibilities for the compliance of any subcontractors.
7. Maintain and make available Material Safety Data Sheets for the Obsidian & contractor materials.
8. Make available & complete Obsidian HSE Opportunity & Worker Observation Cards.
9. Ensure that the appropriate WARNING/HAZARD signs are positioned at the lease entrance.
10. Designate appropriate SMOKING AREA(s) as per regulations.

◊ Complete & report a Site Safety Orientation for workers arriving after the issue of the Safe Work Agreement.

◊ Read & report daily tubing & casing pressures.

◊ Complete & report all pressure & function testing associated with service rig, coil tubing rig & BOP system inspections requirements & frequency as specified by CAODC, ERCB D-037. 7 NEB

- Inspection certificates must be provided for all third party equipment on site.

◊ Complete & document the required BOP & man down practice drills as specified in ERCB D-037 & Obsidian standard practice.

1. Review & discuss daily well control processes.
2. For sites where the presence of H_2S has been identified all personnel should be familiar with the onsite SCBA's and as a minimum complete a 'mask up' operation.

◊ Immediately notify the Well Servicing Coordinator or their designate of ALL incidents and NEB. (Up to and including "unsafe acts & near misses" that could have or did result in someone being injured, equipment damage, spills & releases) & complete the Obsidian Incident Reports.

◊ Complete & submit at the end of operations all material and equipment transfers.

Field Tickets:
Ensure that the well name, location, AFE number, cost coding, and Completions Superintendent are correct on all field tickets prior to signing and the information is entered into WellView. Without this information on all tickets the vendor may experience difficulty in receiving payment. Review the ticket to verify the charges are fair and accurate; if the Wellsite Supervisor feels that the charges are not correct do not sign the ticket and contact the Calgary office with the details. Have the vendor send the invoice into:

Obsidian Energy
200, 207 9th Avenue SW
Calgary, Alberta T2P 1K3
Attention: Completions Engineering

VII CONTACTS

Obsidian

Name	Title	Office	Cellular
Craig Langford	Environmental Coordinator	403-597-0428	

All other contacts will be confirmed 30 days prior to commencement of operations

REGULATORY, HEALTH, & SAFETY AGENCIES

Name	Location	Office
OROGO	Yellowknife	867-767-9097 – Main Switchboard 867-445-8551 – Emergency 867-873-6924 – Spill Response Line
Department of Indian Affairs And Northern Development	Fort Simpson	867- 695-262
Fort Nelson General Hospital	Forth Nelson, BC	250-774-8100
Emergency		911
Forth Liard Emergency Response Team	Fort Liard, NWT	
R.C.M.P		770-1111-phone # 770-4224-fax
Resource Wildlife		770-4300 –phone # 770-4600-fax
Fire Emergency (Safety and Protective Officer)		867- 770-4104 Ext. 116 – phone # 867- 770-4004 – fax #

SERVICE COMPANY:

Service Rig - still determining specific service Rig Company

Important information regarding Back- up Rig - There are service rigs available to us in NE BC in the event that the primary service rig suffers catastrophic failure, one of these would be mobilized to the C31-A location should it be required

Note: Certification of above services will be available onsite. Copy will be submitted to OROGO prior to commencing operations

VIII PROCEDURE

***Note*: Copy of Operations Authorization, Well approval from National Energy Board (NEB) and operating manuals and other procedures to execute the work activity should be available all the time in the location**

: All depths in the program are measured depths.

: ERCB Directive 20: Well Abandonment Guide will be utilized to comply with Canada Oil and Gas Drilling and Production Regulation (SOR/2009-315) part 6 section 56 to 58

: "Oil and Gas Occupational Health and Safety Regulations", "Canada Oil and Gas Drilling and Production Regulations" and "Canada Oil and Gas Operations Act" Copies should be followed and available on site all the time

: Personnel and equipment certificates should always be available during operation

1. Notify the Obsidian field office and OROGO at least 24 hours before commencing well site operations. Ensure the following documentation is completed prior to commencing wellsite operations:

   - Obsidian *Wellsite Hazard Assessment Plot Plan*; scout the location for construction requirements, hazard identification, and wellhead specification.
   - Obsidian *Notice of Supervision* form.
   - Obsidian *Well Site / Facility Handover Form* with the Obsidian production staff.
   - Obsidian 'Ground Disturbance' requirements.
   - Obsidian ***Flaring / Venting / Incinerating Resident Notification Form***; deliver to all the applicable residents and document the date and time of delivery in Wellview - confirm with the Calgary office that the resident notification has been conducted.

     Note: Refer to the key contacts in the program for names and numbers.

2. No flaring is anticipate on this wellbore

3. Perform a surface casing vent flow and gas migration test. Ensure the *Obsidian Surface Casing Vent Flow/Gas Migration Data Sheet* is completed and sent in with the final report.

4. Rig in free standing Class III rig and associated equipment in accordance with which ERCB, NEB, Obsidian Exploration and OH&S specifications. Complete CAODC service rig inspection, and rectify any deficiencies before continuing. Function test crown saver and all diesel engine 'kills'.

   Note: Ensure the Unit and associated equipment can handle 2000 metres of 60.3 mm, J55 tubing

5. Rig in the following safety services as required:

Service	Condition
ETV	Travel time from wellsite to health care facility > 40 minutes
Medic	Number of workers on location > 19
Air Trailer	H_2S > 0 ppm
Safety Supervisor	H_2S > 1.0%
Fire Protection	Heating or high pressure pumping of flammable fluids
Shower unit	Potential of body exposure to injurious materials

6. Sweep area for 'LEL'. Check wellhead for H2S and shut in pressures.

7. Hold a safety and procedural meeting; conduct a pre-job hazard assessment with all onsite Personnel and document in the Wellview report.

   Note: Ensure the Directive 033 - Explosive Mixture and Ignition Potential Identification Sheet is filled out, discussed, and posted in the doghouse.

8. Stump test the BOP equipment, manifold, and lines. Ensure the well is dead; kill well by circulating well over to fresh water. Remove wellhead, install the BOPs and pressure test the ring groove connection. Perform all pressure and function tests to ERCB and Obsidian Energy specifications.

   Note: Low pressure test: 1400 kPa.
   High pressure test: 21 000 kPa (Or Max. capability of wellhead)

Note: water will be used as a kill fluid since Hydrostatic Pressure of water @ deepest existing open perforation is higher than the determined BHP @ that depth. Please see below calculations:

Data: P @ 1768mKB = 10995 KPa

H (depth) of deepest open perfs. = 1973.0mKB

Therefore: P @ 1973.0 mKB: 10995/1768 = X / 1973.0

X =Pressure = 12270 Kpaa

Hydrostatic Pressure of water @ deepest open perfs. = 10Kpa/m * 1768m = 17680 Kpaa

Therefore water as a kill fluid will be enough to suppress the pressure of formation fluids

9. Pull tubing out of hole in the derrick

Details: (Bottom up)
- Sawtooth collar
- 1*60.3mm J-55, EUE, 6.99kg/m joint tubing
- 60.3mm “XN” nipple c/w 47.6mm profile, 45.4mm nogo
- 182 * 60.3mm J-55 ,EUE, 6.99kg/m ,tubing
- 1* 60.3mm J-55 ,EUE, 6.99kg/m , pup joint
- 1*60.3mm J-55 ,EUE, 6.99kg/m , joint tubing
- 88.9mm *60.3mm crossover
- 244.5 * 88.9mm tubing hanger
- “PX” plug in “XN” nipple
- **Tubing bottom landed @ 1769.26mKB**

Collapse: 55800 Kpa ***Burst: 53100 Kpa***
Drift I.D.: 48.285 mm ***Capacity: 0.002017m^3/m***

NOTE: additional 60.3mm tubing needed to set bridge plug @ 1960mKB

10. Run in hole with Schlumberger “WR” retrieving tool on 60.3 mm tubing. Circulate sand off of the “WR” plug. Latch on to plug and open equalizing valve. Unset “WR” plug and let elements relax for 10 minutes. Pull and stand 60.3 mm tubing. Lay down “WR” plug.

11. Run in hole with bit and 244.5 mm scraper while circulating within 15 m of lowest perforation to clean the hole before setting a bridge plug

11. Run hole with 60.3 mm tubing complete with 10K permanent bridge plug and 244.5 mm packer . Set 10K permanent bridge plug at 1960 mKB. Set just above bridge plug and pressure test bridge plug to 7 MPa for 10 minutes. Unset packer, pull and stand tubing. Lay down packer

12. Run in tubing open ended and circulate 15 m of cement on to bridge plug set at 1960 mKB. Circulate 15 m of cement on top of the bridge plug. Pull and stand tubing.

13. Run hole with 60.3 mm tubing complete with 10K permanent bridge plug. Set 10K permanent bridge plug at 1690 mKB. Pressure test bridge plug to 7 MPa for 10 minutes. Unset packer, pull and stand tubing. Lay down setting tool

14. Run in tubing open ended and circulate 15 m of cement on to bridge plug set at 1690 mKB. Circulate 15 m of cement on top of the bridge plug. Pull and stand tubing.

15. Conduct surface casing vent flow test to confirm the wellbore can be cut and capped. Fill out and sign the Surface Casing Vent Flow data sheet. Also ensure there is no pressure on the wellbore. If no evidence of gas migration or surface casing vent flow exits, proceed with cut and cap operation.

16. Excavate a ditch / hole around the wellhead down to a depth of 2.5 m.

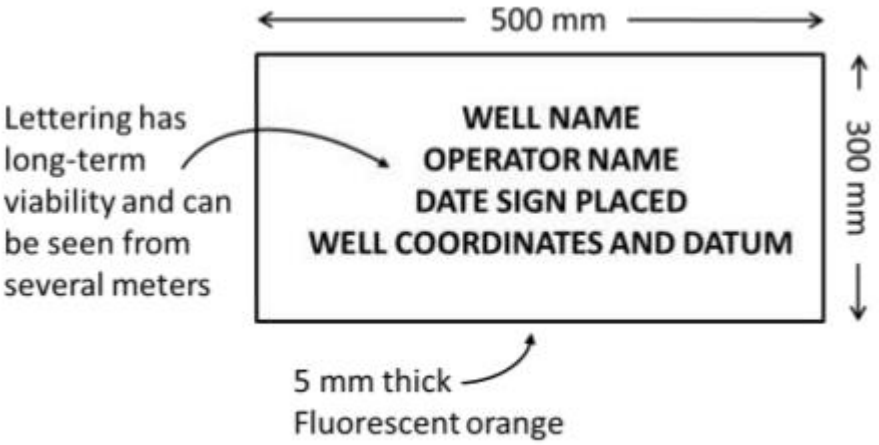
17. Ensure no wellhead pressure has built up by opening the casing or tubing valve. Perform a LEL atmospheric measurement in the excavation to ensure cutting operations are safe. Secure the wellhead with overhead rigging. Cut two windows into the production casing – DO NOT EXCEED 1/3 CASING CIRCUMFERENCE WITH EITHER WINDOW. Cut off both casings so that the production casing is recessed lower than the surface casing and that both casing strings are at least 2.0 meters below ground level when capped. Ensure all workers are fully prepared for well head and casing movement during this operation and are protected accordingly.

18. TACK Weld a metallurgic ally compatible steel plate across the production casing, using non continuous fillet welds to allow the production string to vent. Weld a separate steel plate in a similar fashion onto the surface casing. Weld the first two numbers of the location onto the top of the surface casing plate for future identification (i.e. – LSD-SECTION).

    NOTE: All steel plates must be compatible with the production casing to avoid corrosion.

19. Fill in the excavation above the casings. Remove all debris and move off location. Install post and sign at casing stub location with the following information:

    NOTE: Not fluid or solids waste is anticipated during the operations.



20. Inform the field foreman that the job is complete.

21. Rig out and release all equipment. Note: All waste should be handled in accordance with Obsidian NWT Waste Management Plan document.

22. Prepare a sketch of the lease, including surplus equipment, contaminated area, etc. and forward to Calgary.

APPENDIX A

Review of Un-Cemented Interval – Cdn Forest et al North Liard C-31 well:

5-July-2011

Overview:
The captioned well in the Fort Liard area is scheduled for abandonment, but it has an un-cemented interval below the surface casing, and I was asked to review the well for evidence of porous intervals across the un-cemented zone. The surface casing of the well is set at 710.3 mMD, and the interpreted cement top is 1100 mMD.

Geologic Discussion:
According to the tops for the well, the un-cemented interval falls entirely within the Besa River formation. The Besa River can be a very thick (up to 1600 m), undifferentiated section of Mississippian to Middle Devonian age, but in this well the name Besa River is only applied to the upper portion of that interval, as the Banff (Mississippian) and Exshaw (upper-most Devonian) Formations are picked below the Besa River. Tops of interest are tabulated below.

Samples in the un-cemented interval of the North Liard C-31 well are described as shale and marlstone (argillaceous limestone) with rare tight siltstone interbeds. There are no zones described as having matrix porosity within the interval of interest. However, there is a zone of fracture porosity with a gas show at ~ 1069 mMD.

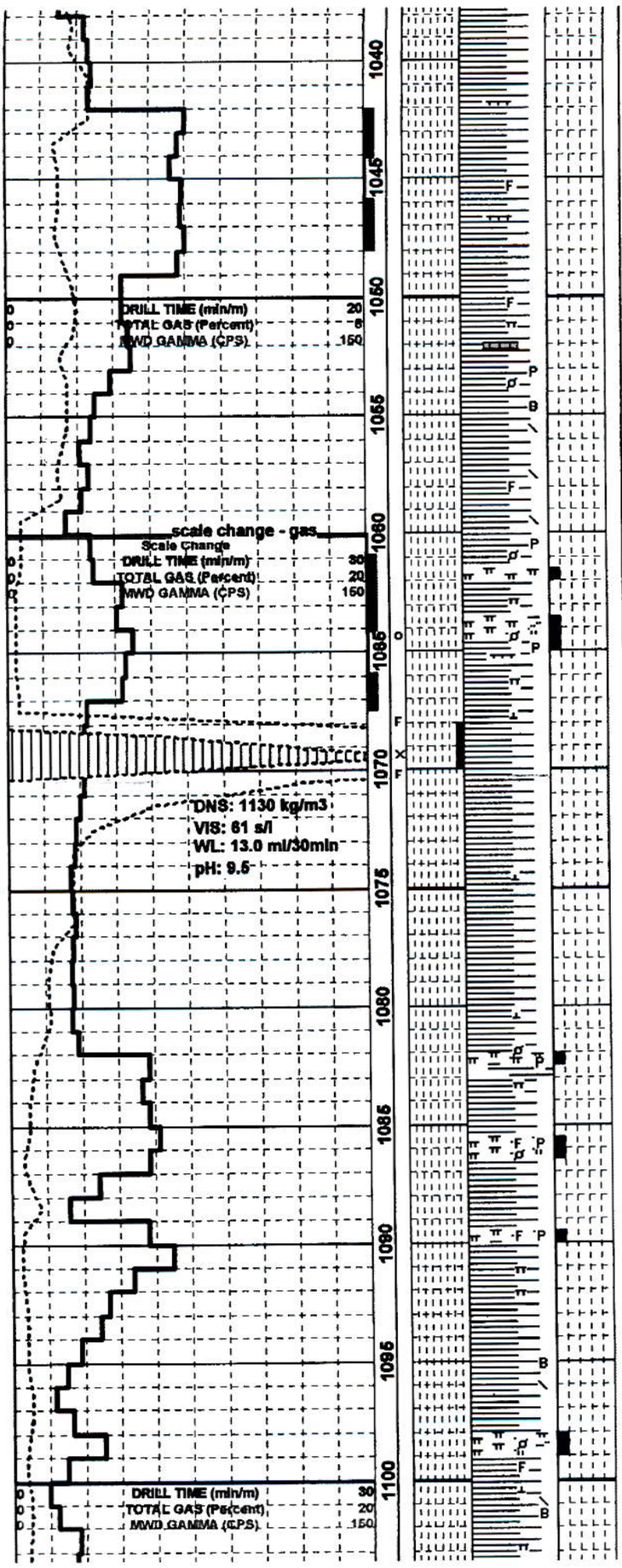
Total mud gas at the point of the fracture increased briefly from 1% (background) to ~ 40%, before quickly falling back to ~ 4% and then gradually tapering off again to ~ 1%. Samples at the point of the fracture are described as shale, with "trace (5%) clear white crystalline calcite, trace drusy calcite crystals, trace slickensides, trace fracture porosity, rare dead oil stain, no fluorescence or cut". There is no way of knowing the extent of the fracture. A copy of the strip log through this interval is attached.

It should also be noted that there is no evidence of any effective reservoir on the logs through this interval. The caliper is showing an extremely enlarged (caved) hole in this section, and neutron-density data are not reliable … the density curve is showing 30 – 50% porosity, due to not being in contact with the borehole wall, across the entire interval from surface casing to ~ 1144 mMD. The extreme hole-enlargement in this interval is probably a contributing factor as to why the cement top falls at 1100 m.

Table of relevant tops - Cdn Forest et al North Liard C-31:

Formation / Wellbore Top	Measured Depth (meters)	TVD Depth (meters)	TVD Subsea (meters)
Besa River Shale	352.2	352.1	+135.9
Surface Casing	710.3		
Interpreted Cement Top	1100		
Banff Marlstone	1318.8	1314.5	-826.5
Exshaw Shale	1542	1537.4	-1049.4

Ken Watson
Senior Geologist
Penn West Exploration
(403) 539-6481



SHALE - medium dark grey to slightly brownish grey colored, fissile to sub-fissile, medium hard, very slightly calcareous, slightly micro-micaceous, common pellet ghosts, trace marly partings.

LIMESTONE - medium brown, wackestone, hard, fossiliferous / pelletal, very argillaceous, dense.

SHALE - medium dark grey to brownish grey colored, fissile to sub-fissile, medium hard, slightly calcareous, very slightly micro-micaceous, trace very fine pyrite, trace pellet / fossils, some darker colored soft waxy streaks, trace marly laminations.

MARLSTONE - medium brownish grey, very fine crystalline to mudstone, medium hard to hard, very argillaceous, silty, fossiliferous / pelletal, rare intrafossil porosity.

SHALE - medium dark brownish grey, fissile, trace (5%) clear white crystalline calcite, trace drusy calcite crystals, trace slickensides, trace fracture porosity, rare dead oil stain, no fluorescence or cut.

SHALE - medium dark grey to slightly brownish grey, fissile, slightly waxy, medium hard, slightly calcareous, trace calcite filled microfractures, some marly streaks, trace darker colored flaky waxy partings, rare pyrite.

SHALE - medium dark slightly brownish grey, sub-fissile to slightly blocky habit, medium hard to hard, slightly calcareous / marly, trace calcite veins.

MARLSTONE - medium brownish grey, blocky, hard, very argillaceous, silty, trace calcite veins, trace fossils.

SHALE - becoming medium dark grey, fissile, platy, medium hard, slightly calcareous, rare pyrite & calcite veins.

SHALE - medium dark grey, fissile, medium hard, slightly calcareous, very slightly micro-micaceous, rare to trace calcite veins, trace marly interlaminae.

MARLSTONE - medium dark brownish grey, sub-fissile to blocky habit, hard, very argillaceous, slightly silty, trace micro-micaceous, trace calcite veins, pellet remains.

COMPANY: CANADIAN FOREST OIL LTD.

WELL: CDN FOREST et al NORTH LIARD C-31

FIELD: NORTH LIARD

PROVINCE: NORTHWEST TERRITORIES

PROVINCE:NORTHWEST TERRITORIES
Field: NORTH LIARD
Location: C-31-60-40-123-30
Well: CDN FOREST et al NORTH LIARD C-31
Company: CANADIAN FOREST OIL LTD.

Schlumberger

COMPENSATED NEUTRON LITHODENSITY LOG

LOCATION

C-31-60-40-123-30
LATITUDE: 60 DEG. 40 MIN
LONGITUDE: 123 DEG. 30 MIN

Elev.: K.B. 487.99 m
G.L. 481.32 m
D.F. 488.29 m

Permanent Datum: GROUND LEVEL — Elev.: 481.32 m
Log Measured From: KELLY BUSHING — 6.7 m above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.
1900

WELL FILE COPY

Logging Date		14-DEC-2000			
Run Number		TWO			
Depth Driller		2629.5 m			
Schlumberger Depth		2630.5 m			
Bottom Log Interval		2619 m			
Top Log Interval		710 m			
Casing Driller Size @ Depth		339.700 mm @ 710 m			@
Casing Schlumberger		710 m			
Bit Size		311.000 mm			
Type Fluid In Hole		K2SO4			
MUD Density	Viscosity	1640 kg/m3	112 s		
MUD Fluid Loss	PH	10 cm3	10.5		
MUD Source Of Sample		FLOWLINE			
RM @ Measured Temperature		0.190 ohm.m @ 16 degC			@
RMF @ Measured Temperature		0.070 ohm.m @ 15 degC			@
RMC @ Measured Temperature		0.090 ohm.m @ 16 degC			@
Source RMF	RMC	MEASURED	MEASURED		
RM @ MRT	RMF @ MRT	0.053 @ 112	0.019 @ 112	@	@
Maximum Recorded Temperatures		112 degC			
Circulation Stopped	Time	13-DEC-2000	23:15		
Logger On Bottom	Time	14-DEC-2000	22:30		
Unit Number	Location	3025	GRANDE PRAIRIE		
Recorded By		GREG STEWART			
Witnessed By		BRYAN BELLMAN			

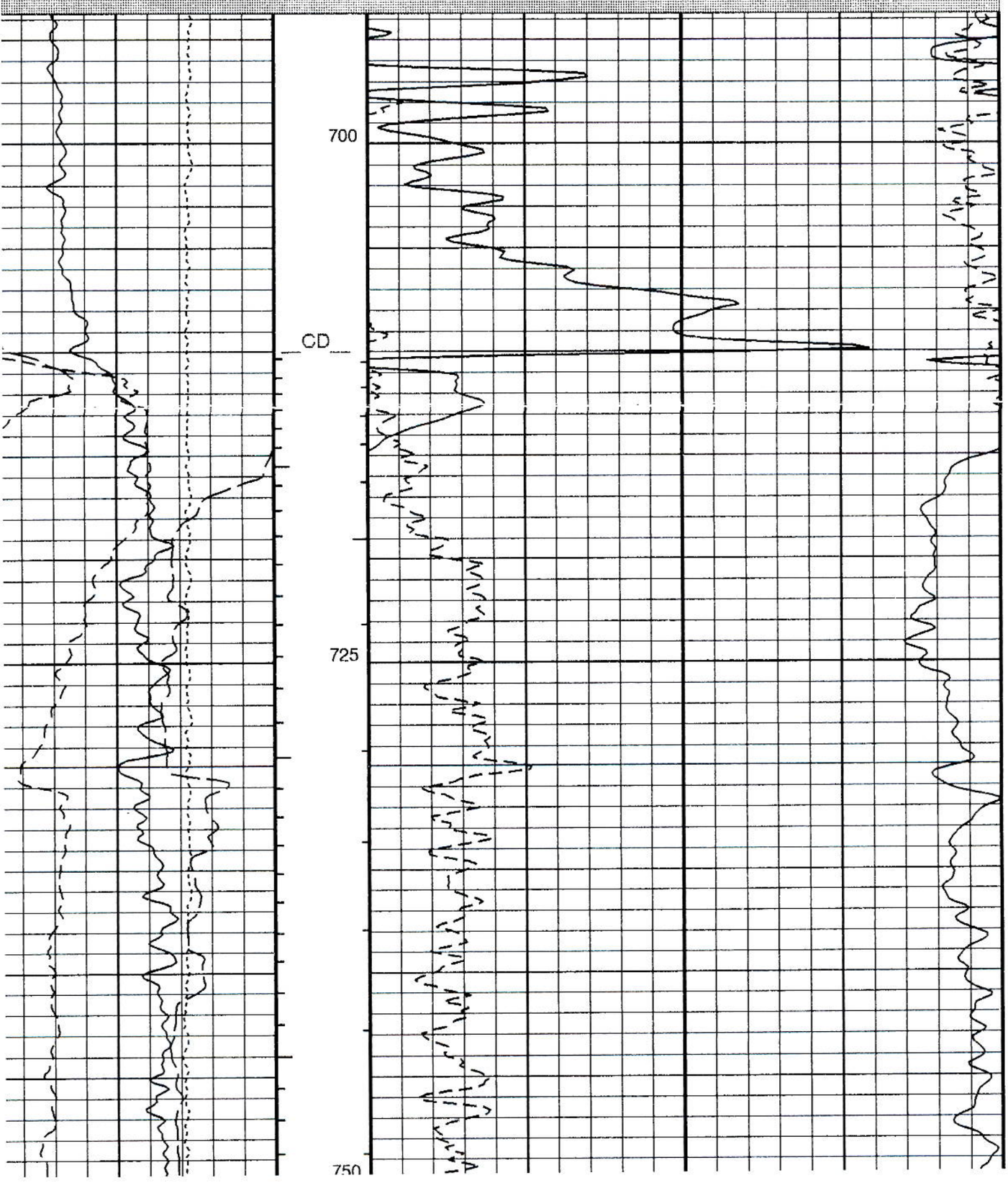
Integrated Cement Volume Minor Pip Every 0.1 M3
Integrated Cement Volume Major Pip Every 1 M3

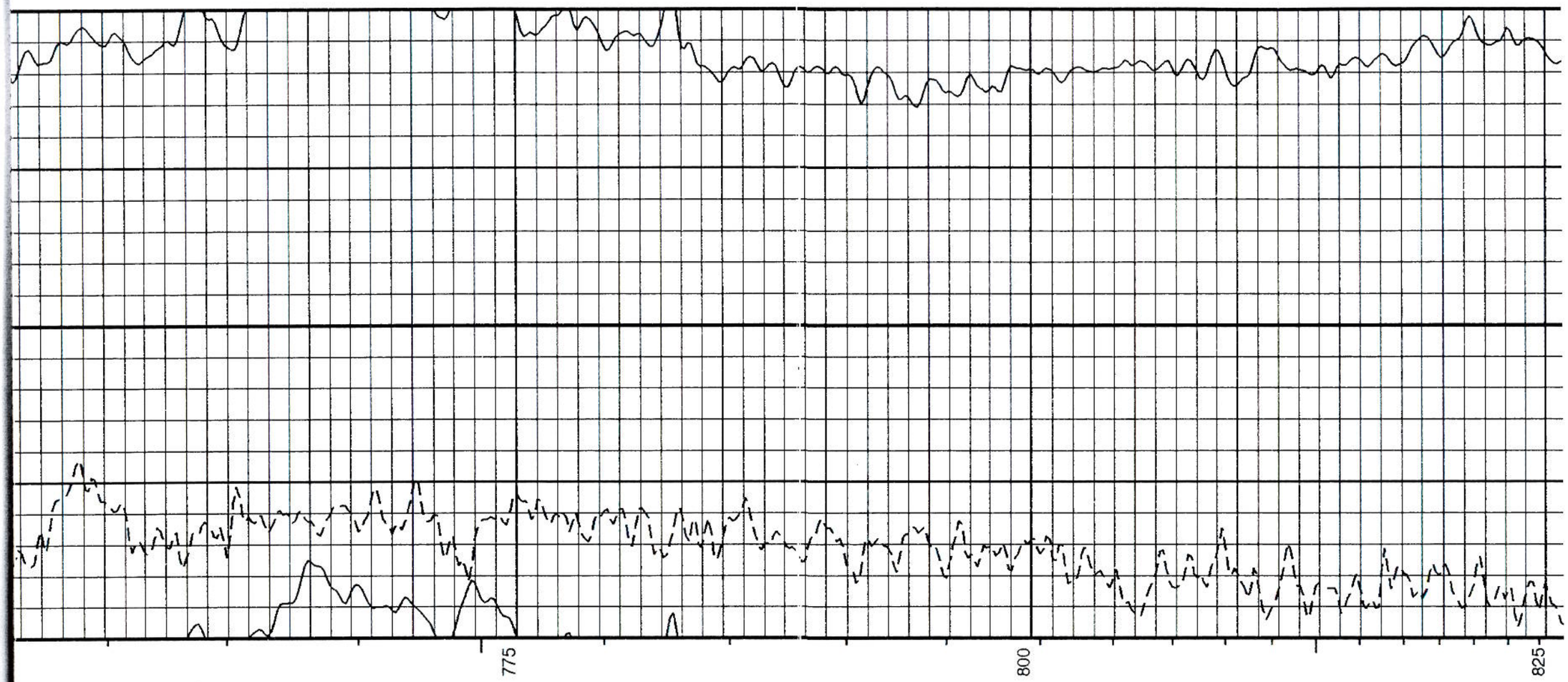
Time Mark Every 60 S

Bit Size (BS)	(MM)	550
Tension (TENS)	(N)	0
Hole Diameter (HD)	(MM)	550
Gamma Ray (GR)	(GAPI)	150
Caliper (CALI)	(MM)	550

PhotoElectric Factor (PEF)		
0	(----)	10
Bulk Density Correction (DRHO)		
450	(K/M3)	-50
Alpha Processed Neutron Porosity (NPOR)		
0.45	(V/V)	-0.15
Density Porosity (DPHI)		
0.45	(V/V)	-0.15

MAIN PASS / SANDSTONE 2650 KG/M3

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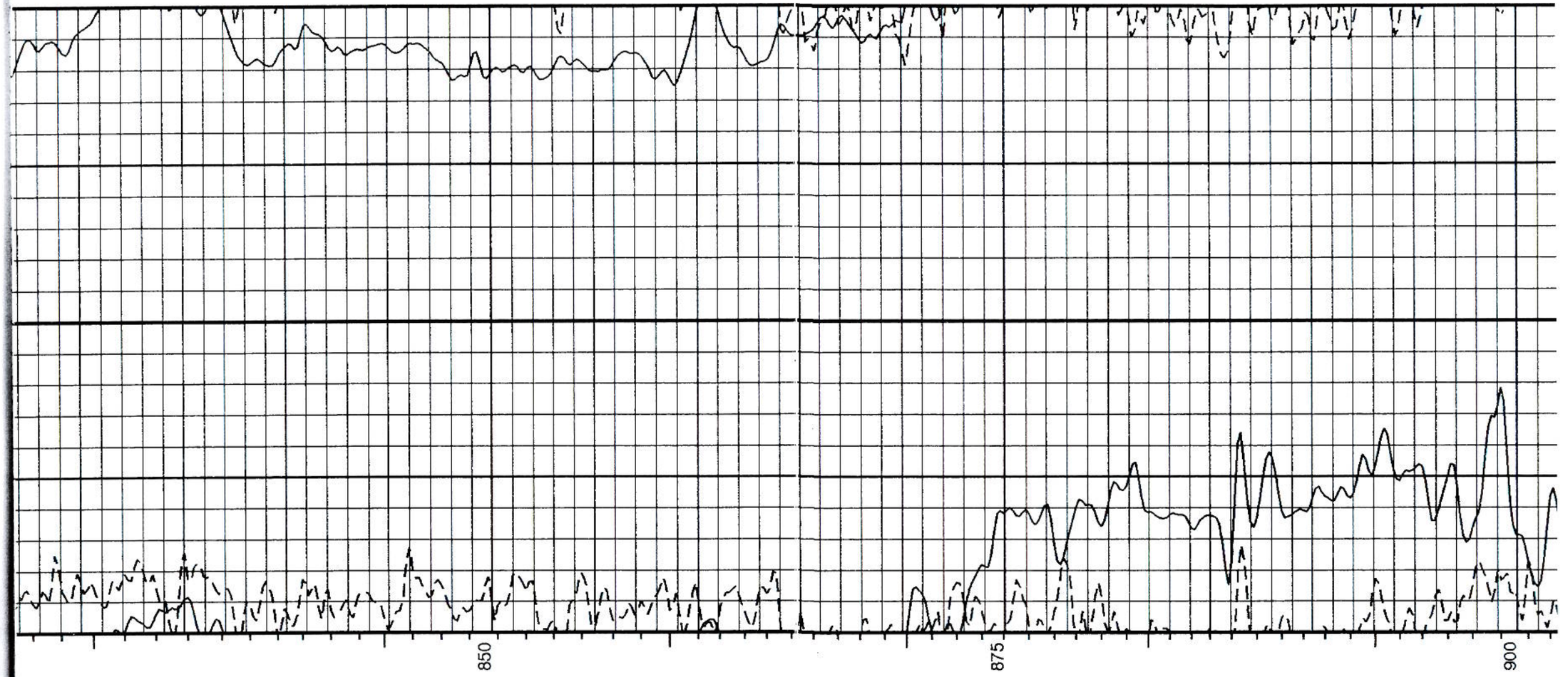
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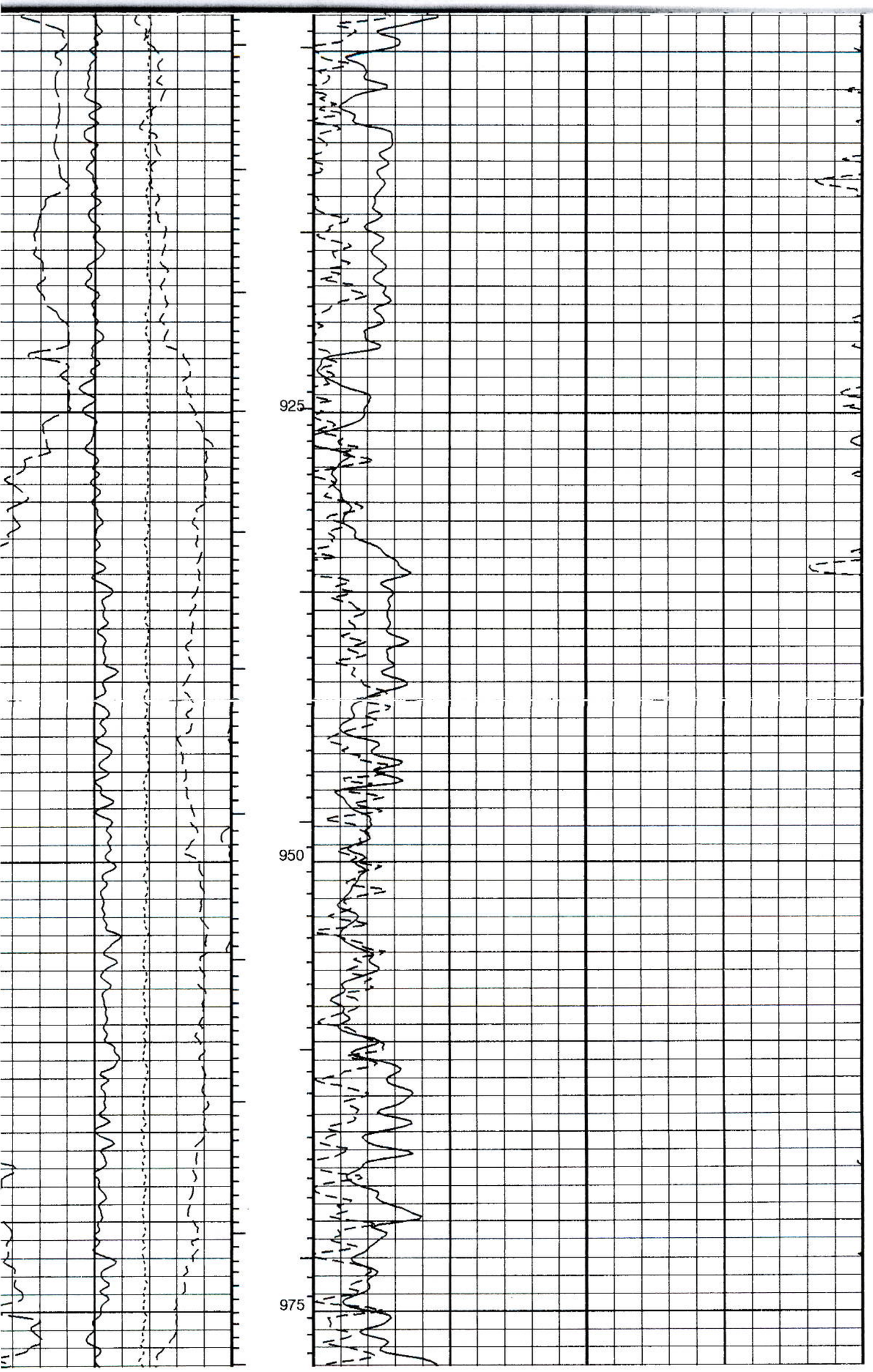
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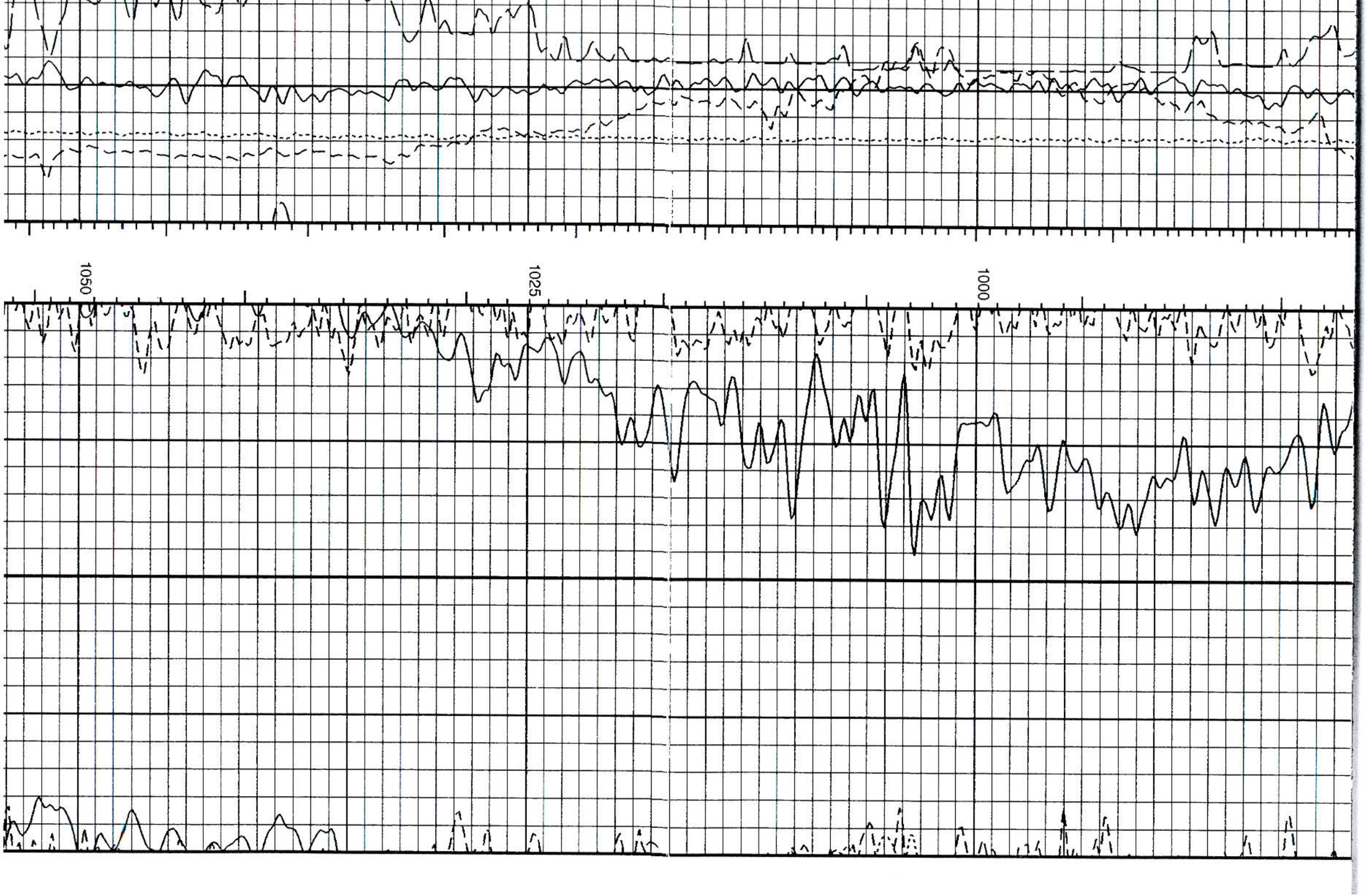
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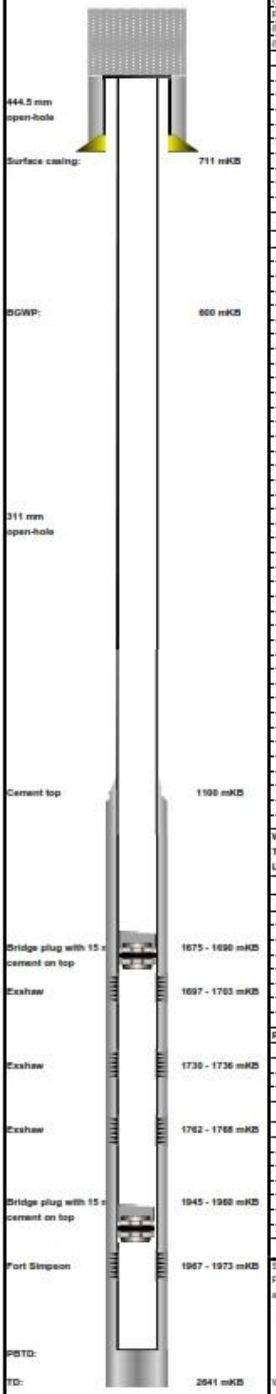
APPENDIX B



WELLBORE PROFILE

Orphan Well Association on behalf of Obsidian Energy LTD.

CDN Forest et al North Liard C-31A

BARLON ENGINEERING

UWI:	300/C-31-6040-12330	Licence:		DATE:	October 29, 2019

ELEVATIONS (meters)

TMD	2641.00	KB ELEV	486.00	KB TO SCF	5.90
TVD	2641.00	GL ELEV	481.30	KB TO THF	5.34
PBTD	2255.00	KB - GL	4.70	Well Status	

CASING DESCRIPTION & GRADE	OD (mm)	WEIGHT (kg/m)	TOP LOCATION	LANDED DEPTH (m)
Surface casing: K-55	339.7	101.0	Surface	711.00
(11 m3 of cement returns to surface)				
Production casing: L-80	244.5	59.5	Surface	2630.00
(No mention of cement returns to surface)				
(Cement top calculated at 1100 mKB)				

Perf Date	Zones	Top Shot	Bottom Shot	Status	Gun Data
	Exshaw	1697.00	1702.00	Abandoned	7 SPM
	Exshaw	1730.00	1736.00	Abandoned	7 SPM
	Exshaw	1762.00	1768.00	Abandoned	7 SPM
	Fort Simpson	1967.00	1973.00	Abandoned	7 SPM

DOWNHOLE DESCRIPTION FROM BOTTOM UP (Tubing String)

ITEM #	DESCRIPTION	LENGTH (m)	TOP OF (mKB)

WEIGHT OF TUBING STRING (daN)		TOTAL STRING LENGTH	
TENSION/COMPRESSION (+/- daN)		STRETCH/SLACKOFF (+/- m)	
LANDED STRING WEIGHT (daN)		TUBING BOTTOM (mKB)	

DOWNHOLE DESCRIPTION FROM BOTTOM UP (Rod String)

AMOUNT	DESCRIPTION	LENGTH (m)	TOTAL (m)

POLISH ROD STICK-UP (m)		TOTAL ROD STRING LENGTH	

PUMP DESCRIPTION	PUMPJACK DESCRIPTION

WELLHEAD DESCRIPTION

ITEM #	DESCRIPTION	SERIAL #	MWP (MPa)	SIZE (mm)

REMARKS

Surface casing cement: 60 m3 1901 kg/m3 + cellophane in the first 40 m3 with 11 m3 of good cement returns

Production casing cement: 20 Tonnes scavenger, 30 tonnes fill, 53 tonnes tail. No cement returns. Cement top calculated at 1100 mKB.

Well status changes:

Prepared by: JS / CM