

OPERATOR:	STATOILHYDRO ASA
WELL:	15/9-F-15
WELLBORE:	15/9-F-15
FIELD:	VOLVE
RIG:	MAERSK INSPIRER
COUNTRY:	NORWAY
DRILL PERMIT#:	3136-P

Report

WLC_PETROPHYSICAL_COMPOSITE_2.DLIS

Prepared by: LOGTEK AS
Date: 04-APR-2014

The WLC_PETROPHYSICAL_COMPOSITE_2.DLIS has been created in accordance with the NPD “Guidelines to the Petroleum Regulations/REPORTING REQUIREMENTS FOR DIGITAL WELL DATA (Drilling Regulations, Section 12)”.

<http://www.npd.no/Global/Norsk/5%20-%20Regelverk/Tematiske%20veiledninger/B og b digital rapportering e.pdf>

Purpose

To preserve ‘specialist’ composited data curves that may be created for a well but which do not fall into the ‘standard’ Composite (Section 3.1) or the ‘Interpreted Data Input’ data sets (described in Section 4.1). These data may have additional work done such as environmental or bed thickness corrections. This data set would normally be used by Petrophysicists. Operators are strongly recommended to report this data set in order to preserve value-added work.

Quality

Similar quality guidelines apply to the compositing work as described in Section 3.1.3 above. All work that is carried out must also be documented in an Information File.

Operationally, it is expected that both the ‘standard’ Composite Log and this ‘specialized’ Composite Log would normally be created in the same process but split into 2 data sets for reporting purposes. This ensures that the same depth shifting is applied to both data sets – an important quality requirement.

Content

Data that are not part of the ‘Composited’ or ‘Interpretation Input’ data sets. This may include:

- additional composited resistivity, NMR or other specialized curve data.
- composited data at high sampling rates for thin-bed analysis.
- a good guide is to include all ‘presentation curves’ from log prints (apart from those already included in the ‘standard’ composite). If quality curves such as Tension or Cable Speed are included (not a requirement), information must be included in the Information Files to show which data curves they refer to.

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MWD data plotted and verified to prints.

MWD POWERPULSE, run 2:

Gaps in digital data not seen on plot.

Depth units are meters.

Quality comments:

MWD POWERPULSE, run 2:

Data above 220.5m logged in casing (from log heading)

Log Remarks:

All depths are referenced to driller's depth and checked at least every stand.

All data is real Time.

All data acquired while drilling.

Gamma Ray measurement is environmentally corrected for mud weight, bit size and collar thickness.

26" section TD at 1378.2m.

MWD ARC, run 4:

Data above 1368.0m logged in casing (from log heading).

Log Remarks:

All depths are referenced to driller's depth and checked at least every stand.

All data from tool memory.

All data acquired while drilling.

Gamma Ray measurement is environmentally corrected for mud weight, bit size and collar thickness.

Resistivity measurements are borehole compensated and require no environmental correction for borehole effect.

12 ¼ in. section TD at 2536m.

MWD ECOSCOPE-SONIC, run 5-6:

Data above 2534.0m logged in casing (from log heading).

All depths are referenced to driller's depth and checked at least every stand.

All data from tool memory.

All data acquired while drilling.

Gamma Ray measurement is environmentally corrected for mud weight, bit size and collar thickness and neutron activation.

Resistivity measurements are borehole compensated and require no environmental correction for borehole effect.

Bulk Density is compensated for tool standoff/mud cake.

Neutron Porosity measurement is calculated with limestone matrix, and is environmentally corrected for bit size, mud weight, temperature, pressure, and mud salinity.

Run 5 POOH at 3670m to change of BHA.

Run 6 and 8 ½" section TD at 4090m.

SONIC BestDT Remarks:

Delta-T Compressional (DTCO) derived from receiver and transmitter arrays.

Delta-T Comp. (DTCO) processed using a 4-15 kHz filter above 2980m, below processed using 10-16 kHz.

Median Residual 4000 noise cut applied.

Editing on WLC_PETROPHYSICAL_COMPOSITE_2.DLIS:

MWD POWERPULSE, run 2:

Gaps in digital data interpolated in order to match plot.

MWD ECOSCOPE-SONIC, run 5-6:

P16H, P22H, P28H, P34H and P40H are affected by casing/large borehole and have been removed above 2534.9m.

Depth shifts:

No depth shifts performed.

CURVE SUMMARY, file WLC_PETROPHYSICAL_COMPOSITE_2.DLIS:

File #1. Incr.: 0.1524

Main Services	Input Curve	Run no.	Date (start)	Interval (meters)	Merge depth (meters)	Depth shifted	Edited
MWD ARC	A28H	4	25-SEP-08	1364.9-2516.4		No	No
MWD ARC	A34H	4	25-SEP-08	1364.9-2516.4		No	No
MWD ARC	A40H	4	25-SEP-08	1364.9-2515.4		No	No
MWD ARC	ATMP*	4	25-SEP-08	1364.9-2517.2		No	No
MWD ECOSCOPE-SONIC	CRPM	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	DCAV*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	DCHO*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	DCVE*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	DRHB	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	DRHL*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	DRHO*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	DRHR*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	DRHU	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD SONIC BestDT	DTCO	5	13-NOV-08	2536.1-3633.2	3633.4	No	No
MWD SONIC BestDT	DTCO	6	23-NOV-08	3633.4-4062.4		No	No
MWD SONIC BestDT	DTRP	6	23-NOV-08	3551.8-4059.3		No	No
MWD SONIC BestDT	DTTP	6	23-NOV-08	3553.7-4062.4		No	No
MWD ECOSCOPE Spectrolith	DWAL_WALK	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ECOSCOPE Spectrolith	DWCA_WALK	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ECOSCOPE Spectrolith	DWFE_WALK	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ECOSCOPE Spectrolith	DWGD_WALK	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ECOSCOPE Spectrolith	DWSI_WALK	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ECOSCOPE Spectrolith	DWSU_WALK	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ECOSCOPE Spectrolith	DWTI_WALK	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ECOSCOPE Spectrolith	DXFE_WALK	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD POWERPULSE	GRM1	2	27-DEC-07	216.9-1348.9		No	Yes
MWD ARC	GR_ARC	4	25-SEP-08	1364.9-2516.3		No	No
MWD ECOSCOPE-SONIC	GRMA	5-6	13-NOV-08	2525.0-4078.8		No	No
MWD ARC	P16H	4	25-SEP-08	1364.9-2516.4		No	No
MWD ECOSCOPE-SONIC	P16H	5-6	13-NOV-08	2534.9-4075.9		No	No
MWD ARC	P16L	4	25-SEP-08	1364.9-2516.4		No	No
MWD ARC	P22H	4	25-SEP-08	1364.9-2516.4		No	No
MWD ECOSCOPE-SONIC	P22H	5-6	13-NOV-08	2534.9-4075.9		No	No
MWD ARC	P22L	4	25-SEP-08	1364.9-2516.4		No	No
MWD ARC	P28H	4	25-SEP-08	1364.9-2516.4		No	No
MWD ECOSCOPE-SONIC	P28H	5-6	13-NOV-08	2534.9-4075.9		No	No
MWD ARC	P28L	4	25-SEP-08	1364.9-2516.4		No	No
MWD ARC	P34H	4	25-SEP-08	1364.9-2516.4		No	No
MWD ECOSCOPE-SONIC	P34H	5-6	13-NOV-08	2534.9-4075.9		No	No
MWD ARC	P34L	4	25-SEP-08	1364.9-2516.4		No	No
MWD ARC	P40H	4	25-SEP-08	1364.9-2516.4		No	No

MWD ECOSCOPE-SONIC	P40H	5-6	13-NOV-08	2534.9-4075.9		No	No
MWD ARC	P40L	4	25-SEP-08	1364.9-2516.4		No	No
MWD ECOSCOPE-SONIC	PEB	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	PEF*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	PEL*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	PER*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	PEU*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE Spectrolith	RHGE	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ECOSCOPE-SONIC	RHOB*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	ROBB	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	ROBL*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	ROBR*	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD ECOSCOPE-SONIC	ROBU	5-6	13-NOV-08	2525.0-4077.5		No	No
MWD POWERPULSE	ROP5	2	27-DEC-07	216.9-1376.9	1377.1	No	No
MWD ARC	ROP5_RM	4	25-SEP-08	1377.1-2535.9	2536.0	No	No
MWD ECOSCOPE-SONIC	ROP5_RM	5-6	13-NOV-08	2536.0-4089.5		No	No
MWD ECOSCOPE Spectrolith	SIGE	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ARC	TAB_ARC_RES	4	25-SEP-08	1364.9-2516.4		No	No
MWD ECOSCOPE-SONIC	TAB_ARC_RES	5-6	13-NOV-08	2525.0-4075.9		No	No
MWD ECOSCOPE-SONIC	TNPH	5-6	13-NOV-08	2525.0-4074.7		No	No
MWD ECOSCOPE-SONIC	UCAV*	5-6	13-NOV-08	2525.0-4077.3		No	No
MWD ECOSCOPE-SONIC	UCHO	5-6	13-NOV-08	2525.0-4077.3		No	No
MWD ECOSCOPE-SONIC	UCVE	5-6	13-NOV-08	2525.0-4077.3		No	No
MWD ECOSCOPE Spectrolith	WCAR	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ECOSCOPE Spectrolith	WCLA	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ECOSCOPE Spectrolith	WPYR	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ECOSCOPE Spectrolith	WQFM	5-6	13-NOV-08	2530.1-4084.8		No	No
MWD ECOSCOPE Spectrolith	WSID	5-6	13-NOV-08	2530.1-4084.8		No	No

* Not presented on plot.

Definitions:

Dynamic depth shift – variable depth shifting (stretch and pull) as opposed to linear depth shifting.

Linear depth shift – Constant depth shift through a certain depth interval.

Reference curve – Curve that will be used as the depth **Reference** for a set of logging curves.

Offset Curve – Curve that will be compared to the **Reference** curve in order to find required depth pairs.

Curves shifted – Curves that will be shifted with depth pairs found by comparing **Reference** to **Offset** curve.

Observed – **Observed** depth is the depth of a point before depth shifting

Actual – **Actual** depth is the depth of the point after depth shifting.

WLC_PETROPHYSICAL_COMPOSITE_2.DLIS completed:

04-APR-2014

WLC_PETROPHYSICAL_COMPOSITE_2_INF_1.PDF completed:

04-APR-2014