OPERATOR:	**STATOIL PETROLEUM AS**
WELL:	**15/9-F-11**
WELLBORE:	**15/9-F-11 T2**
FIELD:	**VOLVE**
RIG:	**MÆRSK INSPIRER**
COUNTRY:	**NORWAY**
DRILL PERMIT#:	**3562-P**

Report

WLC_PETROPHYSICAL_COMPOSITE_2.DLIS

Prepared by:	**LOGTEK AS**
Date:	**21-OCT-2013**

WLC_PETROPHYSICAL_COMPOSITE_2_INF_1

The WLC_PETROPHYSICAL_COMPOSITE_1.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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DRILL PERMIT#: 3562-P

MWD data plotted and verified to prints.

Depth units are meter.

Quality comments:
Wellbore 15/9-F-11 T2 is a sidetrack of wellbore 15/9-F-11 kicked off at 257 m (from MWD heading).

MWD AZTK-OTK-CCN-ORD-MTK-SDTK, run 4-7:
Data above 1358 m logged in casing (run 6, depth from log heading).
Data above 2571 m logged in casing (run 7, depth from log heading).
Log Comments:
Depth reference is driller's depth. All depths are measured depths (MD).
Gamma Ray is not corrected for borehole size and mud density in the 26" hole section.
20" casing shoe was reported at 1358.0 m (MD) and logged at 1364.9 m (MD) in LWD Run#6.
14" casing shoe was reported at 2571m (MD) and logged at 2570.8 m (MD) in LWD Run#7.
Well 15/9-F-11 T2 was kicked off from a cement plug from well 15/9-F-11 at 257 m (MD) in LWD Run#4.
Due to sensor proximity to steel, a successful function test of the resistivity tool was not performed in the post-run verification in LWD Run#5 and post-run verification in LWD Run#6. QC logs and log response in general indicated that there were no problems with the tools.
ORD version 2.6 was used in LWD Run#7, with an ORD Wear indicator:
Pre Run: Stabilizer: N/A, Source: 4, Long Space Receiver:4.
Post Run: Stabilizer: N/A, Source: 4, Long Space Receiver:3.
The interval from 2574-2577 m (MD) was logged 45 hrs after being drilled, due to a separate 12.25" drillout run without LWD tools. This was performed prior to LWD Run#7.
Azimuthal Density data start at 2802.1 m (MD). This is the depth of the first good survey in LWD Run#7.
Logger's TD in well 15/9-F-11 T2 at 4561.6 m (MD).
Log remarks:
Gap in FE data due to a power shutdown in the logging unit (~3300 m).
Gap in MagTrak data due to intermittent lockup of the MagTrak tool (~3575 m).

MWD SDTK Processed, run 7:
Data above 2571 m logged in casing (depth from log heading).
Log Comments:
Acoustic data presented on log is from the post processed data set utilizing 11 kHz Monopole Excitation.
Acoustic data presented on log is from the post processed data set utilizing 4 & 8 kHz Quadrupole Excitation and 11 kHz Refracted Shear. 4 kHz Quadrupole data is corrected for dispersion.
4 kHz Quadrupole is used in intervals: 2583.0 – 2625.5 m (MD) and 2644.7-2662.9 m (MD), 11 kHz Refracted Shear in interval 4206.5-4297.3 m (MD) and 8 kHz Quadrupole for the rest of the log.
No shear data found below 4513 m (MD).
Log remarks:
No shear data presented from 4148.7-4206.5 m (MD) due to Shear signal being masked by the mud fluid arrival in this interval.

MWD MTK Processed, run 7:
Data above 2571 m logged in casing (depth from log heading).
Log Comments:
The MagTrak data on this log has been post processed using the following parameters:

Running average of 16 (RA=16).
Standard sandstone T2 cutoff's are used. CBW=3.3ms, BVI=33ms.
Number of T2 bins are 27 over the range of 0.5 – 4096ms.
Permeability curve has been calculated using Timor-Coates equation with constants n=2, m=4 and C=10 (or b=2, C=10).
Log remarks:
Gap in FE data due to a power shutdown in the logging unit.
Gap in MagTrak data due to intermittent lockup of the MagTrak tool.

Editing on WLC_PETROPHYSICAL_COMPOSITE_2.DLIS:
MWD OTK, run 6:
Resistivity data are affected by washout/large borehole above 1365.0 m and have been removed.

MWD AZTK-CCN-ORD-MTK-SDTK, run 7:
Resistivity data are affected by casing and washout/large borehole above 2575.7 m and have been removed.

Depth shifts:
None.

CURVE SUMMARY, file WLC_PETROPHYSICAL_COMPOSITE_2.DLIS:

File #1. Increment: 0.1m

Main Services	Input Curve	Run no.	Date (start)	Interval (meter)	Merge depth (meter)	Depth shifted	Edited
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC01M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC02M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC03M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC04M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC05M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC06M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC07M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC08M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC09M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC10M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC11M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC12M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC13M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC14M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC15M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDC16M	7	28-APR-13	2602.1-4539.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDCQF01	7	28-APR-13	2602.1-4539.0		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDCQF02	7	28-APR-13	2602.1-4539.0		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDCQF03	7	28-APR-13	2602.1-4539.0		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	ABDCQF04	7	28-APR-13	2602.1-4539.0		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	BDCFM	7	28-APR-13	2527.1-4539.0		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	CALCM	7	28-APR-13	2526.4-4538.4		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	DPEFM*	7	28-APR-13	2527.1-4539.0		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	DRHFM	7	28-APR-13	2527.1-4539.0		No	No
MWD SDTK Processed	DTC	7	28-APR-13	2575.9-4522.4		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	DTHM	7	28-APR-13	2511.1-4523.1		No	No
MWD SDTK Processed	DTS	7	28-APR-13	2582.9-4513.0		No	No
MWD AZTK-OTK-CCN-ORD-MTK-SDTK	GRCFM	4-7	22-MAR-13	238.3-4551.0		No	No
MWD AZTK-OTK-CCN-ORD-MTK-SDTK	GRSIM	4-7	22-MAR-13	238.3-4551.1		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	MBW	7	28-APR-13	2499.4-4511.0		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	MCBW	7	28-APR-13	2499.4-4511.0		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	MPERM	7	28-APR-13	2499.4-4511.0		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	MPHS	7	28-APR-13	2499.4-4511.0		No	No
MWD OTK	NBGRCFM	6	12-APR-13	1258.5-2570.3		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	NPCKLFM	7	28-APR-13	2524.4-4536.3		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	NPCLFM*	7	28-APR-13	2524.4-4536.3		No	No
MWD AZTK-CCN-ORD-MTK-SDTK	NPLFM*	7	28-APR-13	2524.4-4536.3		No	No
MWD AZTK-OTK-CCN-ORD-MTK-SDTK	RACEHM	4-7	22-MAR-13	240.5-4553.1		No	Yes

MWD AZTK-OTK-CCN-ORD-MTK-SDTK	RACELM	4-7	22-MAR-13	240.5-4553.1	No	Yes
MWD AZTK-OTK-CCN-ORD-MTK-SDTK	ROPAVG	4-7	22-MAR-13	257.1-4561.8	No	No
MWD AZTK-OTK-CCN-ORD-MTK-SDTK	RPCEHM	4-7	22-MAR-13	240.5-4553.1	No	Yes
MWD AZTK-OTK-CCN-ORD-MTK-SDTK	RPCELM	4-7	22-MAR-13	240.5-4553.1	No	Yes
MWD AZTK-OTK-CCN-ORD-MTK-SDTK	RPCESHM	4-7	22-MAR-13	240.5-4553.1	No	Yes
MWD AZTK-OTK-CCN-ORD-MTK-SDTK	RPTHM	4-7	22-MAR-13	257.0-4553.1	No	No
MWD SDTK Processed	SVC	7	28-APR-13	2575.9-4522.1	No	No
MWD AZTK-CCN-ORD-MTK-SDTK	SVHM	7	28-APR-13	2511.1-4523.1	No	No
MWD SDTK Processed	SVS*	7	28-APR-13	2582.9-4513.0	No	No
MWD AZTK-OTK-CCN-ORD-MTK-SDTK	TCDM	4-7	22-MAR-13	257.1-4561.8	No	No
MWD SDTK Processed	TTC	7	28-APR-13	2575.9-4520.9	No	No
MWD SDTK Processed	TTS	7	28-APR-13	2582.9-4513.0	No	No
MWD SDTK Processed	VPVS	7	28-APR-13	2582.9-4513.0	No	No
MWD AZTK-OTK-CCN-ORD-MTK-SDTK	WOBAVG	4-7	22-MAR-13	257.1-4561.8	No	No

* Not presented on plot.

File #2. Increment: 0.1m

Main Services	Input Curve	Run no.	Date (start)	Interval (meter)	Merge depth (meter)	Depth shifted	Edited
MWD MTK Processed	BVLINE	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	CBWLINE	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	MBVI	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	MBVM	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	MBW	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	MCBW	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	MPERM	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	MPHE	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	MPHS	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	T2GM	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR01	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR02	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR03	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR04	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR05	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR06	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR07	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR08	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR09	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR10	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR11	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR12	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR13	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR14	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR15	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR16	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR17	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR18	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR19	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR20	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR21	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR22	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR23	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR24	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR25	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR26	7	28-APR-13	2526.7-4511.3		No	No
MWD MTK Processed	TPOR27	7	28-APR-13	2526.7-4511.3		No	No

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:	**21-OCT-2013**
WLC_PETROPHYSICAL_COMPOSITE_2_INF_1.PDF completed:	**21-OCT-2013**