VISION Resistivity

Gamma Ray - Resistivity

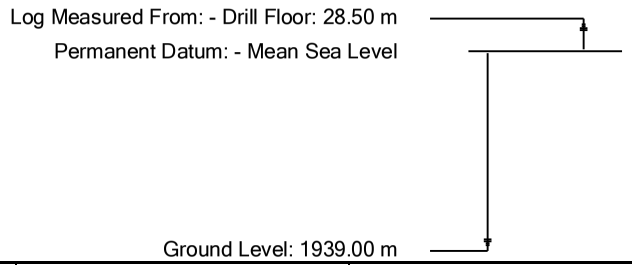
Schlumberger

Recorded Mode log, Measured Depth 1:200

Company:	JAMSTEC
Well:	C0002Q
Field:	C0002
Rig Name:	D/V Chikyu
Prefecture:	Wakayama
Country:	Japan

Latitude:	33° 18' 3.042" N	UWID:	
Longitude:	136° 38' 12.174" E	Rig Name:	D/V Chikyu
Block:		Rig Type:	Drill ship

FL:	Pacific Ocean
FL1:	X = 652,382.39 m
FL2:	Y = 3,685,834.62 m



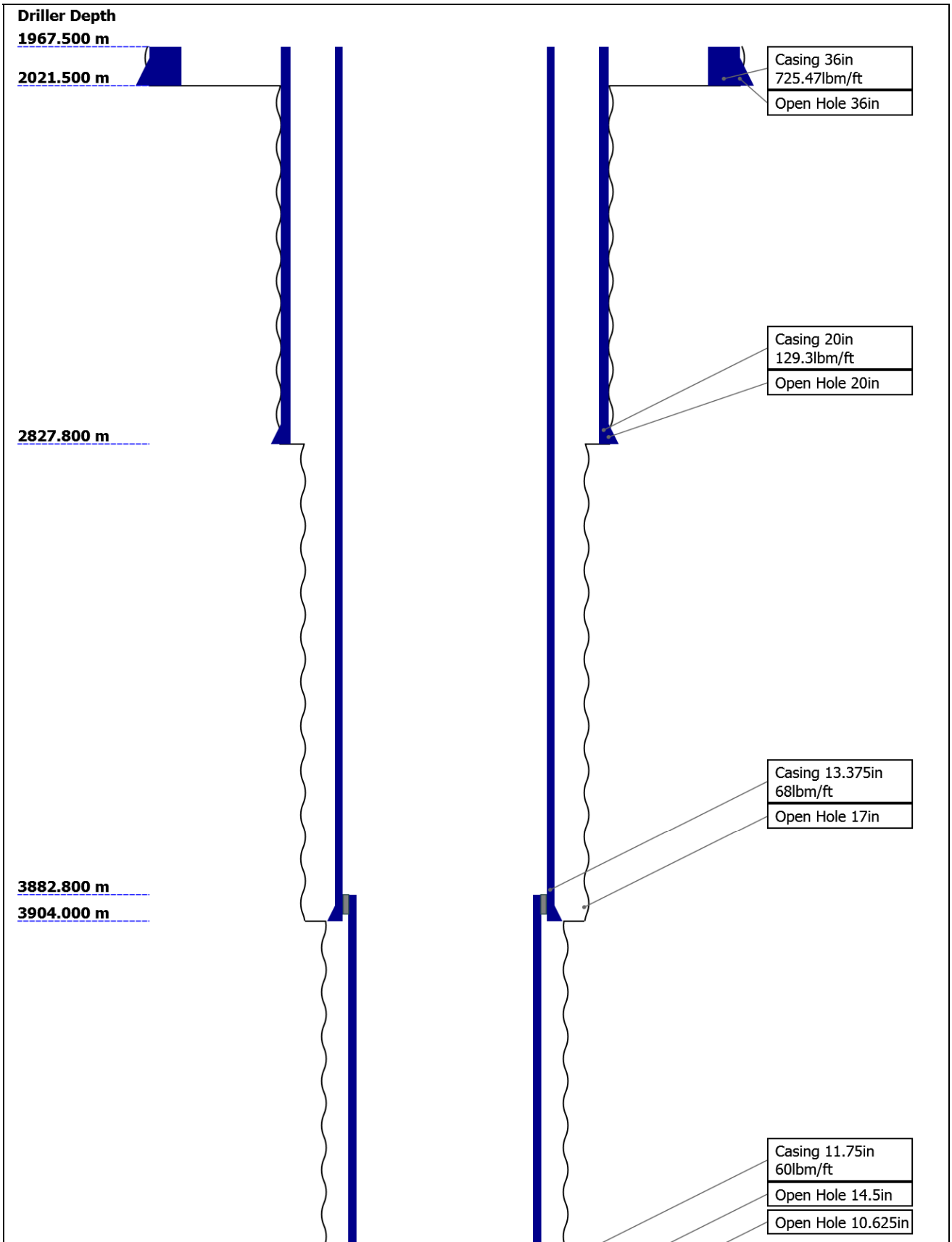
Acquisition Dates:	11-Dec-2018 -- 13-Dec-2018	Other Services:
Log Interval:	4879.60(m)MD -- 4922.82(m)MD	Direction and Inclination
Index Types:	Measured Depth	APWD
Index Scales:	1:200	
Depth Source:	Driller's Depth	
Depth Sensor:	DES	
Print Type:	Final	
Spud Date:	26-Oct-2018	

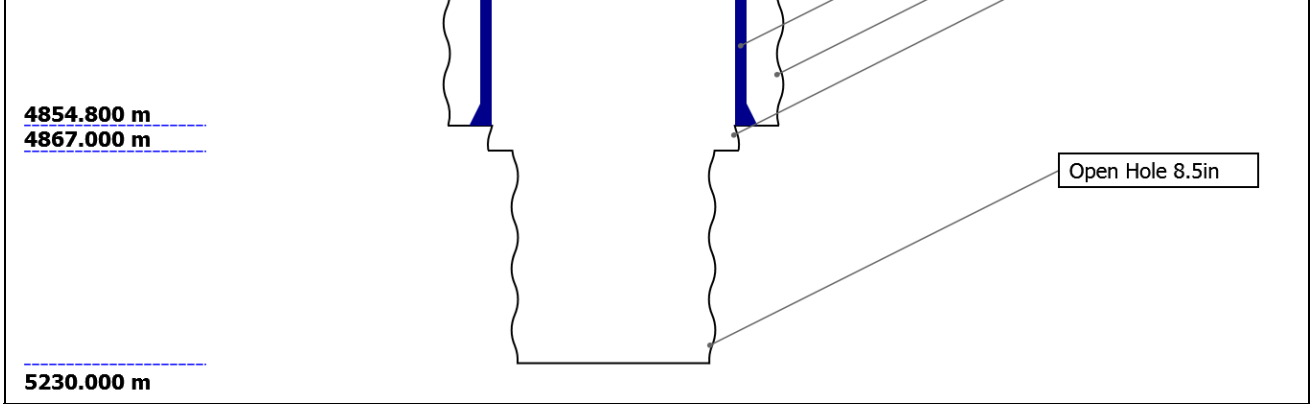
Country: Japan
Prefecture: Wakayama
Rig Name: D/V Chikyu
Field: C0002
Well: C0002Q
Company: JAMSTEC

Disclaimer

Contents

Well Sketch





Borehole Size/Casing Record

Bit						
Bit Size (in)	36	20	17	14.5	10.625	8.5
Top Driller (m)	1967.5	2021.5	2827.8	3904	4854.8	4867
Bottom Driller (m)	2021.5	2827.8	3904	4854.8	4867	5230
Casing						
Size (in)	36	20	13.375	11.75		
Weight (lbm/ft)	725.47	129.3	68	60		
Inner Diameter (in)	32.099	18.779	12.415	10.772		
Grade	X56	X56	N/A	N/A		
Top Driller (m)	1967.5	1967.5	1967.5	3882.8		
Bottom Driller (m)	2021.5	2827.8	3904	4854.8		

Operational Run Summary

Parameter (unit)	Run 5					
Date Log Started	09-Dec-2018					
Time Log Started	14:11:00					
Date Log Finished	14-Dec-2018					
Time Log Finished	21:06:57					
Bit Size (in)	8.500					
Bit Start Depth (m)	0.00					
Bit Stop Depth (m)	0.00					
Top Log Interval (m)	4879.60					
Bottom Log Interval (m)	4922.82					
Max Hole Deviation (deg)	1.64					
Azimuth of Max Deviation (deg)	90.69					
Logging Unit Number	OLU-MB 8054					
Logging Unit Location	Zone2					
Recorded By	SMurakami/KBian					
Witnessed By	YSanada/YKido					
Service Order Number	18JAP0007					

Borehole Fluids

Borehole Fluids

Parameter(unit)	Run 5					
Fluid Type	Water					
Max Recorded Temperatures (degC)	61					
Source of Sample	Active Tank					
Salinity (ppm)	141288.5					
Density (g/cm3)	1.37					
Funnel Viscosity (s)	56					
Fluid Loss (cm3)	2.5					
PH	9.9					
Source RMF	Pressed					
RMC	Pressed					
RM @ Meas Temp (ohm.m@degC)	0.06 @ 21.1					
RMF @ Meas Temp (ohm.m@degC)	0.05 @ 20.2					
RMC @ Meas Temp (ohm.m@degC)	0.07 @ 19.8					
RM @ BHT (ohm.m@degC)	0.04 @ 50					
RMF @ BHT (ohm.m@degC)	0.03 @ 50					
RMC @ BHT (ohm.m@degC)	0.04 @ 50					
Total Solid (%)	16.5					
High Gravity Solids (%)	0					

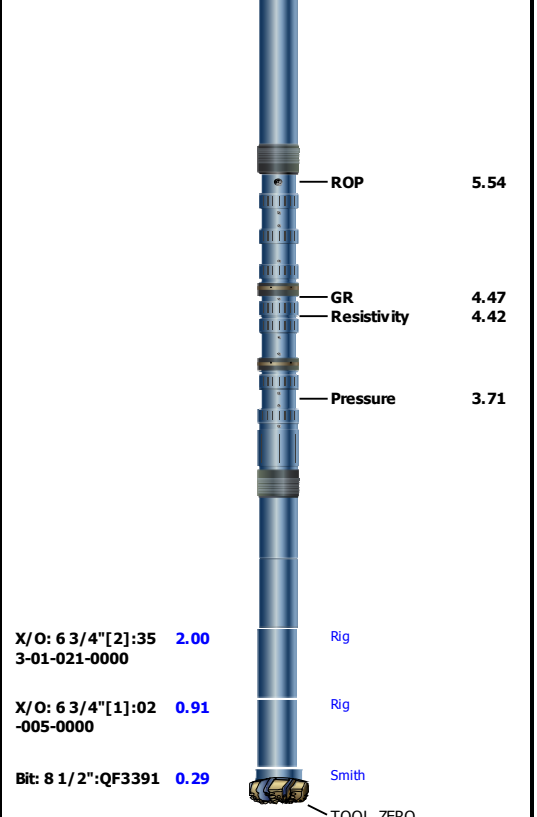
Remarks and Equipment Summary

Run 5: Toolstring

Equip name	Length	MP name	Offset
TELE675:B0540	16.25	TeleScope675	
		D&I	11.94
		GR	11.29
		ROP	9.59
ARC6:ZL37312	7.78	Schlumberger	

Run 5: Remarks

- Depth Reference is driller's depth measured from Rotary Table.
- Data presented is Recorded Mode data which was acquired while drilling.
- Gamma Ray measurement is corrected for bit size, mud weight, tool collar size and potassium content (1.53%) in the mud.
- Resistivity measurement is borehole compensated and environmentally corrected for hole size and mud resistivity.
- Reason of POOH: Well condition below the casing window was unstable. Descided to set a bridge plug above the whipstock and attemp to sidetrack again.
- Drilling Time: 28 hrs.
- Pumping Time: 58.72hrs.
- Drilling hours is estimation. The bit never went deeper than previous hole depth.



Survey Record

Survey Calculation

Method :	Minimum Radius of Curvature	DLS Method :	Lubinski
North Reference :	Grid North	Total Correction Formula :	Magnetic Dec - Grid Convergence
Grid Convergence :	0.90 deg		

Rig Location

Latitude :	33° 18' 3.042" N	Longitude :	136° 38' 12.174" E

Tie In Point

Measured Depth:	4853.87 m	Inclination:	1.64 deg	Azimuth:	90.69 deg
True Vertical Depth:	4852.02 m	North Displacement:	-0.27 m	East Displacement:	49.95 m
N/-S VSec Origin:	0.00 m	E/-W VSec Origin:	0.00 m	Vertical Section Azimuth:	90.28 deg

D&I Inits Computed and Values Used - Run 5

Geomagnetic Model :	HDGM 2018	Geomagnetic Date :	17-Nov-2018
Computed Location B :	46164.86 nT +/- 300.00nT	Used Location B :	46164.86 nT +/- 300.00nT
Computed Location G :	998.92 mgn +/- 2.50mgn	Used Location G :	998.92 mgn +/- 2.50mgn
Computed Magnetic Dip :	47.02 deg +/- 0.45deg	Used Magnetic Dip :	47.02 deg +/- 0.45deg
Computed Magnetic Dec :	-7.16 deg	Used Magnetic Dec :	-7.16 deg
Computed Total Correction :	-8.06 deg	Used Total Correction :	-8.06 deg

Survey Quality Index

2 : Long Survey failed mag criteria

28 : Tie-In Point

Survey Correction Index

0 : No correction

Survey Description Index

0 : Not Flagged Survey

Seq	MD (m)	Incl (deg)	Azim (deg)	Course (m)	TVD (m)	V Sec (m)	N/ -S (m)	E/ -W (m)	Closure (m)	at Azim (deg)	DLS deg/30m	Tool Type	QI	CI	DI
1	4853.87	1.64	90.69	- - - -	4852.02	49.95	-0.27	49.95	49.95	90.31	0.00	TIP	28	0	0
2	4870.63	3.61	138.88	16.76	4868.77	50.54	-0.67	50.54	50.54	90.76	5.00	TeleScope	2	0	0
3	4882.77	3.16	140.86	12.13	4880.88	51.00	-1.22	51.00	51.01	91.37	1.14	TeleScope	2	0	0
4	4897.67	0.64	145.72	14.91	4895.77	51.31	-1.60	51.30	51.33	91.79	5.07	TeleScope	2	0	0
5	4908.67	0.96	50.36	11.00	4906.77	51.42	-1.60	51.41	51.44	91.78	3.28	TeleScope	2	0	0

Run 5

Run 5_LWD Log

Software Version

Acquisition System	Version
Maxwell 2018 SP2	8.2.104493.3100
Application Patch	DnM_TestKit-PD-DHS31-2018-2_8.2.104864

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Include Parallel Data
Run 5	Ream Down 1	Down	4883.86 m	4927.37 m	11-Dec-2018 3:04:00 PM	13-Dec-2018 11:51:00 AM	Yes
All depths are referenced to toolstring zero							

Log

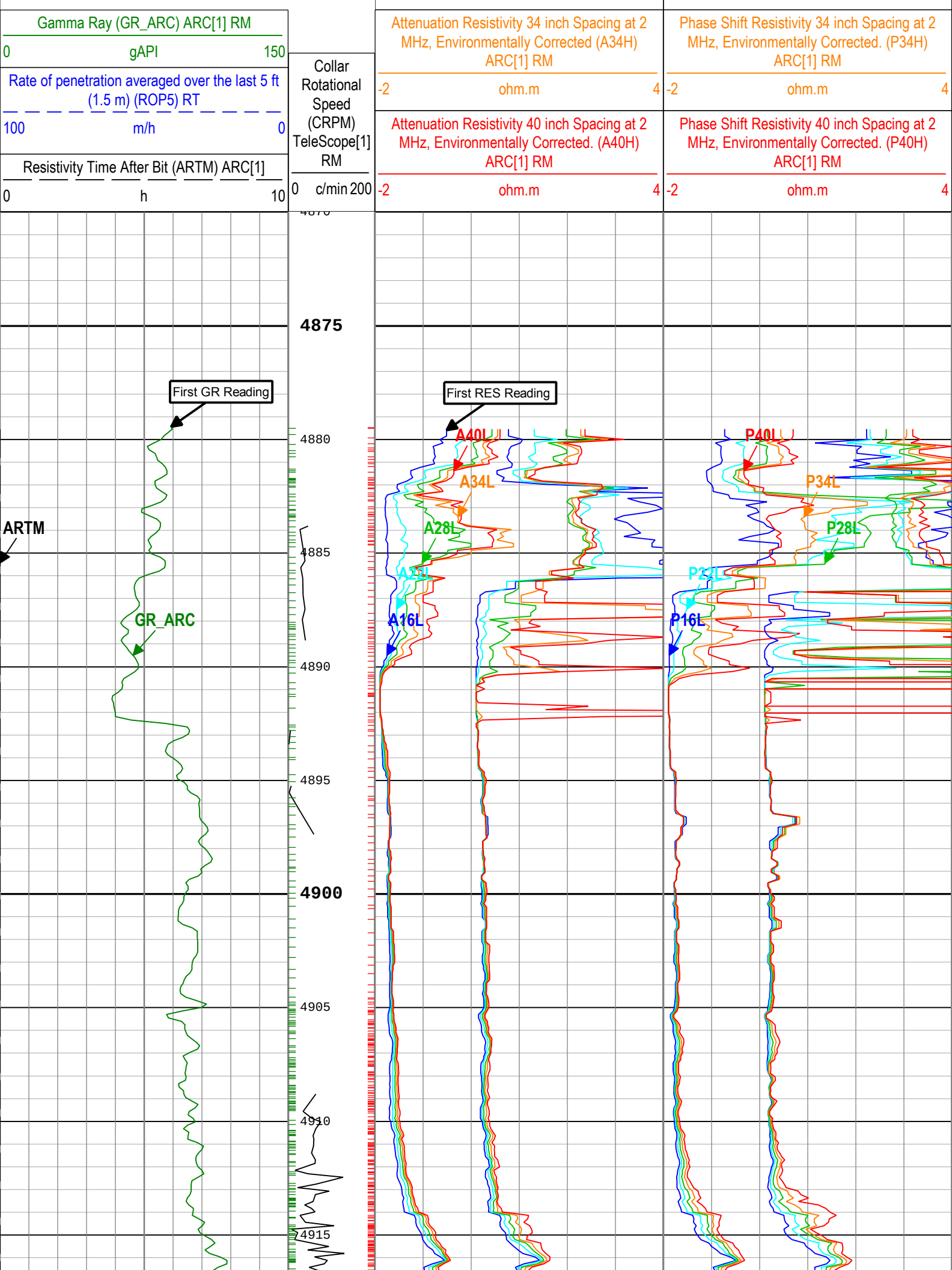
Company:JAMSTEC Well:C0002Q Run 5:S121

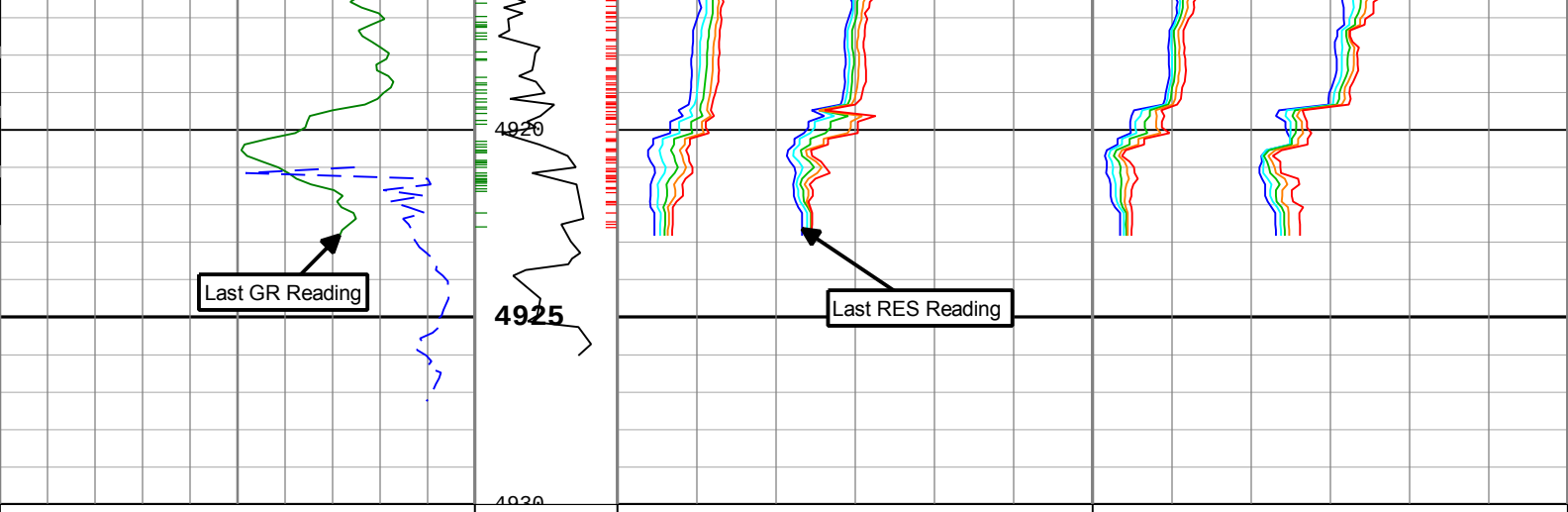
Description: ARC Blended Resistivity 2-Log Format: Log (VISION Resistivity MD) Index Scale: 1:200 Index Unit: m Index Type: Measured Depth
Creation Date: 28-Feb-2019 17:56:30

TICK_ARC_GR - Gamma Ray Tick Marks ARC[1] RM

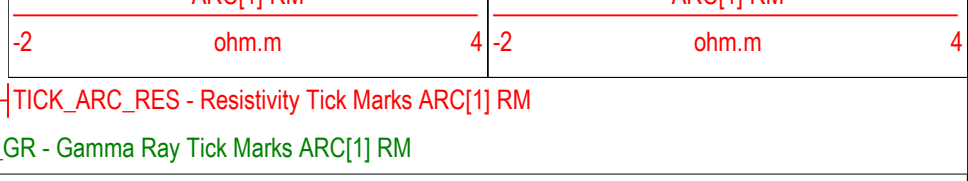
TICK_ARC_RES - Resistivity Tick Marks ARC[1] RM

Attenuation Resistivity 16 inch Spacing at 400 KHz, Environmentally Corrected (A16L) ARC[1] RM 0 ohm.m 6	Phase Shift Resistivity 16 inch Spacing at 400 KHz, Environmentally Corrected. (P16L) ARC[1] RM 0 ohm.m 6
Attenuation Resistivity 22 inch Spacing at 400 KHz, Environmentally Corrected (A22L) ARC[1] RM 0 ohm.m 6	Phase Shift Resistivity 22 inch Spacing at 400 KHz, Environmentally Corrected. (P22L) ARC[1] RM 0 ohm.m 6
Attenuation Resistivity 28 inch Spacing at 400 KHz, Environmentally Corrected (A28L) ARC[1] RM 0 ohm.m 6	Phase Shift Resistivity 28 inch Spacing at 400 KHz, Environmentally Corrected. (P28L) ARC[1] RM 0 ohm.m 6
Attenuation Resistivity 34 inch Spacing at 400 KHz, Environmentally Corrected (A34L) ARC[1] RM 0 ohm.m 6	Phase Shift Resistivity 34 inch Spacing at 400 KHz, Environmentally Corrected. (P34L) ARC[1] RM 0 ohm.m 6
Attenuation Resistivity 40 inch Spacing at 400 KHz, Environmentally Corrected (A40L) ARC[1] RM 0 ohm.m 6	Phase Shift Resistivity 40 inch Spacing at 400 KHz, Environmentally Corrected. (P40L) ARC[1] RM 0 ohm.m 6
Attenuation Resistivity 16 inch Spacing at 2 MHz, Environmentally Corrected (A16H) ARC[1] RM -2 ohm.m 4	Phase Shift Resistivity 16 inch Spacing at 2 MHz, Environmentally Corrected. (P16H) ARC[1] RM -2 ohm.m 4
Attenuation Resistivity 22 inch Spacing at 2 MHz, Environmentally Corrected (A22H) ARC[1] RM -2 ohm.m 4	Phase Shift Resistivity 22 inch Spacing at 2 MHz, Environmentally Corrected. (P22H) ARC[1] RM -2 ohm.m 4
Attenuation Resistivity 28 inch Spacing at 2 MHz, Environmentally Corrected (A28H) ARC[1] RM -2 ohm.m 4	Phase Shift Resistivity 28 inch Spacing at 2 MHz, Environmentally Corrected. (P28H) ARC[1] RM -2 ohm.m 4


Gamma Ray (GR_ARC) ARC[1] RM
0
gAPI
150
Rate of penetration averaged over the last 5 ft (1.5 m) (ROP5) RT
100
m/h
0
Resistivity Time After Bit (ARTM) ARC[1]
0
h
10
Collar Rotational Speed (CRPM) TeleScope[1] RM
0
c/min
200
Attenuation Resistivity 34 inch Spacing at 2 MHz, Environmentally Corrected (A34H) ARC[1] RM
-2
ohm.m
4
Attenuation Resistivity 40 inch Spacing at 2 MHz, Environmentally Corrected. (A40H) ARC[1] RM
-2
ohm.m
4
Phase Shift Resistivity 34 inch Spacing at 2 MHz, Environmentally Corrected. (P34H) ARC[1] RM
-2
ohm.m
4
Phase Shift Resistivity 40 inch Spacing at 2 MHz, Environmentally Corrected. (P40H) ARC[1] RM
-2
ohm.m
4
4875
4880
4885
4890
4895
4900
4905
4910
4915
First GR Reading
First RES Reading
ARTM
GR_ARC
A40L
A34L
A28L
A22L
A16L
P40L
P34L
P28L
P22L
P16L



Gamma Ray (GR_ARC) ARC[1] RM	Collar Rotational Speed (CRPM) TeleScope[1] RM	Attenuation Resistivity 16 inch Spacing at 400 KHz, Environmentally Corrected (A16L) ARC[1] RM	Phase Shift Resistivity 16 inch Spacing at 400 KHz, Environmentally Corrected. (P16L) ARC[1] RM
0 gAPI 150	0 c/min 200	0 ohm.m 6	0 ohm.m 6
Rate of penetration averaged over the last 5 ft (1.5 m) (ROP5) RT		Attenuation Resistivity 22 inch Spacing at 400 KHz, Environmentally Corrected (A22L) ARC[1] RM	Phase Shift Resistivity 22 inch Spacing at 400 KHz, Environmentally Corrected. (P22L) ARC[1] RM
100 m/h 0		0 ohm.m 6	0 ohm.m 6
Resistivity Time After Bit (ARTM) ARC[1]		Attenuation Resistivity 28 inch Spacing at 400 KHz, Environmentally Corrected (A28L) ARC[1] RM	Phase Shift Resistivity 28 inch Spacing at 400 KHz, Environmentally Corrected. (P28L) ARC[1] RM
0 h 10		0 ohm.m 6	0 ohm.m 6
		Attenuation Resistivity 34 inch Spacing at 400 KHz, Environmentally Corrected (A34L) ARC[1] RM	Phase Shift Resistivity 34 inch Spacing at 400 KHz, Environmentally Corrected. (P34L) ARC[1] RM
		0 ohm.m 6	0 ohm.m 6
		Attenuation Resistivity 40 inch Spacing at 400 KHz, Environmentally Corrected (A40L) ARC[1] RM	Phase Shift Resistivity 40 inch Spacing at 400 KHz, Environmentally Corrected. (P40L) ARC[1] RM
		0 ohm.m 6	0 ohm.m 6
		Attenuation Resistivity 16 inch Spacing at 2 MHz, Environmentally Corrected (A16H) ARC[1] RM	Phase Shift Resistivity 16 inch Spacing at 2 MHz, Environmentally Corrected. (P16H) ARC[1] RM
		-2 ohm.m 4	-2 ohm.m 4
		Attenuation Resistivity 22 inch Spacing at 2 MHz, Environmentally Corrected (A22H) ARC[1] RM	Phase Shift Resistivity 22 inch Spacing at 2 MHz, Environmentally Corrected. (P22H) ARC[1] RM
		-2 ohm.m 4	-2 ohm.m 4
		Attenuation Resistivity 28 inch Spacing at 2 MHz, Environmentally Corrected (A28H) ARC[1] RM	Phase Shift Resistivity 28 inch Spacing at 2 MHz, Environmentally Corrected. (P28H) ARC[1] RM
		-2 ohm.m 4	-2 ohm.m 4
		Attenuation Resistivity 34 inch Spacing at 2 MHz, Environmentally Corrected (A34H) ARC[1] RM	Phase Shift Resistivity 34 inch Spacing at 2 MHz, Environmentally Corrected. (P34H) ARC[1] RM
		-2 ohm.m 4	-2 ohm.m 4
		Attenuation Resistivity 40 inch Spacing at 2 MHz, Environmentally Corrected. (A40H) ARC[1] RM	Phase Shift Resistivity 40 inch Spacing at 2 MHz, Environmentally Corrected. (P40H) ARC[1] RM



Description: ARC Blended Resistivity 2-Log Format: Log (VISION Resistivity MD) Index Scale: 1:200 Index Unit: m Index Type: Measured Depth
Creation Date: 28-Feb-2019 17:56:30

Channel Processing Parameters

Run 5: Parameters

Parameter	Description	Tool	Value	Unit
ABNT	Abnormal Transmitter Indicator	ARC6	NO_TX_FAILED	
BH_COMPUTE	Borehole Effect Computation Option	ARC6	No	
BHK	Drilling Fluid Potassium Concentration	Borehole	1.53	%
BHT	Bottom Hole Temperature	Borehole	50	degC
BS	Bit Size	DNMSESSION	8.5	in
DEPTH_SEL	Depth Selection Parameter	DNMSESSION	Driller's Depth	
DFD	Drilling Fluid Density	Borehole	1.37	g/cm3
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
GGRD	Geothermal Gradient	Borehole	18.23	degC/km
GRSE_RM	Generalized Mud Resistivity Selection for Recorded Mode	Borehole	REMS(RM)	
GTSE_RM	Generalized Temperature Selection for Recorded Mode	Borehole	GTEM_GRDSURF	
HIGH_BLEND	High Resistivity Threshold for Blending	ARC6	2	ohm.m
INVAS_COMPUTE	Invasion Computation Option	ARC6	No	
LOW_BLEND	Low Resistivity Threshold for Blending	ARC6	1	ohm.m
MST	Mud Sample Temperature	Borehole	21.1	degC
MULTIEFFECT_COMPUTE	Multi-effect Computation Option	ARC6	No	
RMS	Resistivity of Mud Sample	Borehole	0.06	ohm.m
SHT	Surface Hole Temperature	Borehole	20	degC
ATMP_ARC	ARC Temperature Selection	ARC6	Annular	
UNIFORM_COMPUTE	Uniform Rock Computation Option	ARC6	No	

Tool Control Parameters

Run 5: Parameters

Parameter	Description	Tool	Value	Unit
OFFBTM_TH	Threshold for deciding whether the bit is off bottom	DNMSESSION	0.4	m

Run 5

Run 5_DML

Software Version

Acquisition System	Version
Maxwell 2018 SP2	8.2.104493.3100
Application Patch	DnM_TestKit-PD-DHS31-2018-2_8.2.104864

Composite Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Include Parallel Data
Run 5	Ream Down 1	Down	4883.86 m	4927.37 m	11-Dec-2018 3:04:00 PM	13-Dec-2018 11:51:00 AM	Yes

All depths are referenced to toolstring zero

Log

Company:JAMSTEC Well:C0002Q
Run 5:S121

Description: Format: Log (Drilling Mechanics Log 675 RM MD) Index Scale: 1:200 Index Unit: m Index Type: Measured Depth Creation Date:

28-Feb-2019 17:56:31

Rate of penetration averaged over the last 5 ft (1.5 m) (ROP5) RT
100 m/h 0

Standpipe Pressure (SPPA) RT
0 MPa 30

Total flow rate of all active pumps (TFLO) RT
0 gal/min 1000

CRPM_Tele Scope
0 c/min 200

Stick Slip Indicator (STICKNSLIP) TeleScope[1] RM
0 c/min 400

Downhole Annulus Pressure (APRS_ARC) ARC[1] RM
0 MPa 80

Downhole Annulus Temperature (ATMP) ARC[1] RM
0 degC 100

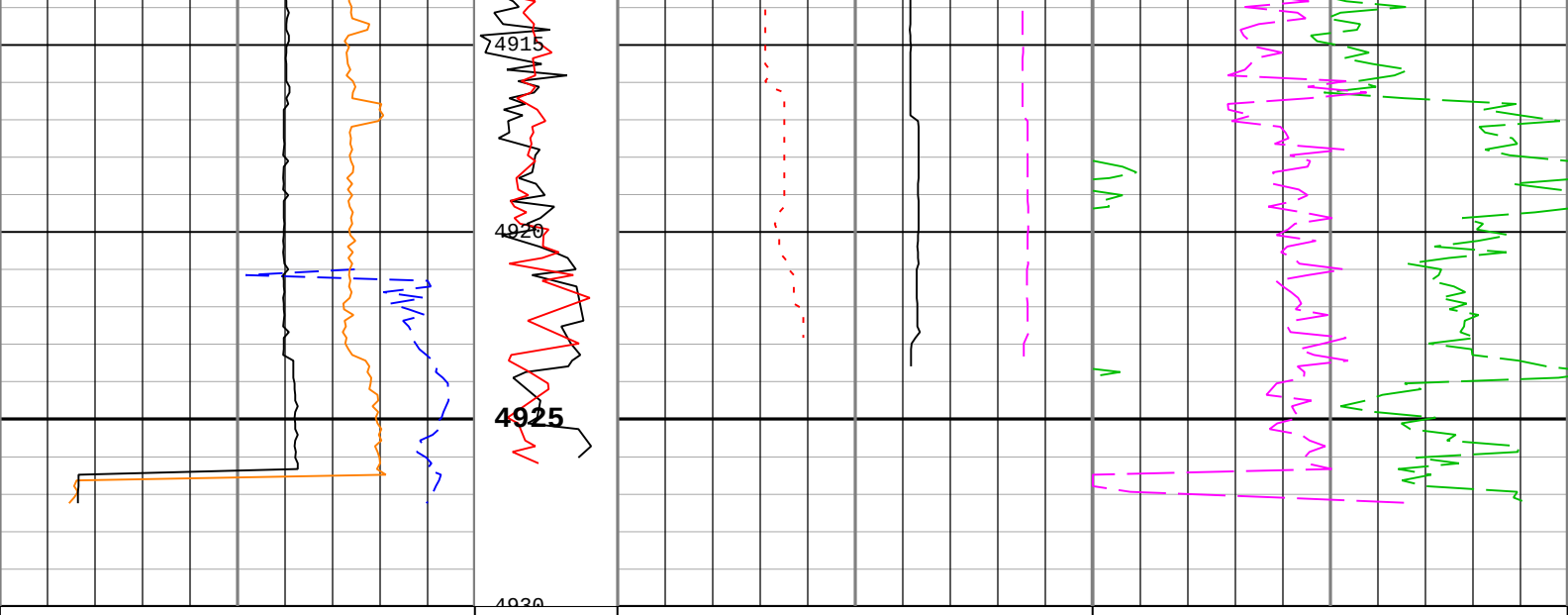
Equivalent Circulating Density (ECD_ARC) ARC[1] RM
0.8 g/cm3 1.8

Surface Weight On Bit (SWOB) RT
-300 kN 300

Surface Torque (TQA) RT
0 kN.m 50

4875
4880
4885
4890
4895
4900
4905
4910

TFLO
SPPA
STICKNSLIP
ATMP
ECD_ARC
APRS_ARC
TQA
SWOB



Rate of penetration averaged over the last 5 ft (1.5 m) (ROP5) RT	CRPM_Tele Scope	Downhole Annulus Pressure (APRS_ARC) ARC[1] RM	Surface Weight On Bit (SWOB) RT
100 m/h 0	0 c/min 200	0 MPa 80	-300 kN 300
Standpipe Pressure (SPPA) RT	**Stick Slip Indicator (STICKNSLIP) TeleScope[1] RM**	**Downhole Annulus Temperature (ATMP) ARC[1] RM**	**Surface Torque (TQA) RT**
0 MPa 30	0 c/min 400	0 degC 100	0 kN.m 50
Total flow rate of all active pumps (TFLO) RT		**Equivalent Circulating Density (ECD_ARC) ARC[1] RM**	
0 gal/min 1000		0.8 g/cm3 1.8	

Description: Format: Log (Drilling Mechanics Log 675 RM MD) Index Scale: 1:200 Index Unit: m Index Type: Measured Depth Creation Date: 28-Feb-2019 17:56:31

Channel Processing Parameters

Run 5: Parameters

Parameter	Description	Tool	Value	Unit
DEPTH_SEL	Depth Selection Parameter	DNMSESSION	Driller's Depth	
FLEV	Depth of Drilling Fluid Level to LMF (Log Measured From)	Borehole	3	m
RHO_SEAWATER	Density of the Sea Water	Borehole	1.022	g/cm3
SF_FLAG	Mud Return to Sea Floor (No Riser)?	Borehole	No	

Tool Control Parameters

Run 5: Parameters

Parameter	Description	Tool	Value	Unit
OFFBTM_TH	Threshold for deciding whether the bit is off bottom	DNMSESSION	0.4	m

Calibration Report

ARC6 (Array Resistivity Compensated 675) Calibration - Run 5

Primary Equipment :

Elec. Chassis HP with AIM Receiver AREA 570

RESAIRCAL - Resistivity: Air

Master (Time Frame File): 02:39:59 24-Oct-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Attenuation T1 at 2 MHz	dB	Master	8.500	6.500	8.784	10.500
Attenuation T2 at 2 MHz	dB	Master	6.500	4.500	6.175	8.500
Attenuation T3 at 2 MHz	dB	Master	4.500	2.500	5.413	6.500
Attenuation T4 at 2 MHz	dB	Master	4.600	2.600	4.086	6.600

Attenuation T5 at 2 MHz	dB	Master	3.600	1.600	3.965	5.600	
Phase Shift T1 at 2 MHz	deg	Master	0.100	-3.900	0.207	4.100	
Phase Shift T2 at 2 MHz	deg	Master	0.100	-3.900	-0.155	4.100	
Phase Shift T3 at 2 MHz	deg	Master	0.100	-3.900	0.147	4.100	
Phase Shift T4 at 2 MHz	deg	Master	0.100	-3.900	-0.186	4.100	
Phase Shift T5 at 2 MHz	deg	Master	0.100	-3.900	0.129	4.100	
Attenuation T1 at 400 KHz	dB	Master	8.500	6.500	8.782	10.500	
Attenuation T2 at 400 KHz	dB	Master	6.500	4.500	6.189	8.500	
Attenuation T3 at 400 KHz	dB	Master	4.500	2.500	5.402	6.500	
Attenuation T4 at 400 KHz	dB	Master	4.600	2.600	4.090	6.600	
Attenuation T5 at 400 KHz	dB	Master	3.600	1.600	3.966	5.600	
Phase Shift T1 at 400 KHz	deg	Master	0.100	-3.900	1.065	4.100	
Phase Shift T2 at 400 KHz	deg	Master	0.100	-3.900	-1.152	4.100	
Phase Shift T3 at 400 KHz	deg	Master	0.100	-3.900	1.103	4.100	
Phase Shift T4 at 400 KHz	deg	Master	0.100	-3.900	-1.162	4.100	
Phase Shift T5 at 400 KHz	deg	Master	0.100	-3.900	1.075	4.100	

GRGAIN - Gamma Ray: Blanket

Master (Time Frame File): 18:47:37 24-Oct-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Gamma Ray Calibration Gain		Master	1.000	0.580	1.155	1.250	

Company:	JAMSTEC
Well:	C0002Q
Field:	C0002
Rig Name:	D/V Chikyu
Prefecture:	Wakayama
Country:	Japan

Schlumberger

VISION Resistivity

Gamma Ray - Resistivity

Recorded Mode log, Measured Depth 1:200