

Esso Australia Pty Ltd Sampling Operations Report

FIELD: Barracouta
WELL: BTA_A3
DATE: 29th Mar – 10th April
TEST: Cased Hole MDT Reservoir Evaluation (CHDT)

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Client: Esso Australia
Job No: AOH450
Date: 29th Mar - 10th Apr 05

Field: Barracouta
Well: BTA_A3
Installation: Ensco 102

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Summary

Esso Australia contracted Oilphase-DBR, the sampling and analysis specialists of Schlumberger, to provide the on site sampling and analytical chemistry services on the Ensco 102, for the evaluation of well BTA_A3. In one run of the Wireline Cased Hold MDT tool, a total of four downhole samples were collected using one Oilphase Non- Reactive Single Phase Multi-Chamber (NR-SPMC) tool, two Wireline 450 cc MPRS's and one 2 ¾ gallon large volume sampler (MRSC). On-site analysis was performed to measure sulphur and mercury content in pre-determined samples.

Cased Hole MDT Run 2

The CHDT tool was configured with two Multi Sample Modules (MRMS) loaded with four NR-SPMC sampling tools (which are coated to minimise hydrogen sulphide loss), and eight Wireline MPSR's. One 2 ¾ gallon large volume sample chambers (MRSC's) was also run in the tool configuration. The toolstring was configured for low shock sampling and was run in hole on Wireline.

The CHDT tool was run in hole to a depth of 2674 m MD for the first sampling point. Using the CHDT technology, a hole was drilled through the casing and the cement to allow the Wireline tool to come into communication with the reservoir fluids. The sampling point was pumped out for a little under an hour (to minimise any mud filtrate contamination) before the reservoir fluid was diverted to the samplers. The 2 ¾ gallon chamber, two MPSR's and one NR-SPMC's were filled from this point prior to pulling out of hole.

On recovery to surface, all samplers were found to have captured sample and closed successfully. The NR-SPMC's and MPSR's were removed from the MRMS and opening pressures of the tools recorded, confirming all samplers had collected samples successfully. A partial flash was performed on the SPMC and MRSC for Hydrogen Sulphide and Carbon Dioxide measurements by length of stain tubes. UOP sampling was then performed from the SPMC by flowing 40 Litres of gas through scrubbing solutions. Titrations were carried out on the scrubbing solutions for the determination of Hydrogen Sulphide, Mercaptans and Carbonyl Sulphide in the gas phase. The two MPSR tools were heated back to reservoir temperature and agitated before being transferred into Oilphase Single-phase Sample Bottles (SSB) for safe transport to the laboratory. Mercury concentration was measured on the MRSC sample by flowing gas through gold sand traps and analysing by Sir Galahad atomic fluorescence method. The remaining MRSC condensate sub sample was collected in a 1 litre glass bottle.

All sampling, transfer and well site chemistry equipment was rigged down and consigned for shipment back to Perth via the Sale Schlumberger base. All samples were shipped from the rig in a transportation container to Petro Lab in South Australia for analysis.

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Open Hole Sample Listings

MDT Run No: N/A

Sample No.	Sample Date	Sample Time	Sample Nature	Sample Point	Bottle Type	Bottle No.
1.01	07/04/05	14:00	Mud Sample	Mud Pit	1 Litre Plastic cont.	N/A

MDT Run No: 2

Sample No.	Sample Date	Sample Time	Sample Nature	Sample Point	Bottle Type	Bottle No.
2.01	07/04/05	11:42	Bottomhole Sample	2674 m MD	1 Litre Glass bottle	N/A
2.02	07/04/05	12:37	Bottomhole Sample	2674 m MD	Single Phase (SSB)	10005-MA
2.03	07/04/05	12:45	Bottomhole Sample	2674 m MD	Single Phase (SSB)	10001-MA

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Sequence of Events

Date	Time	Event	
<u>CHDT Logging Operations – BTA_A3</u>			
28/03/04	12:30	1 x Oilphase personnel arrives on Ensco 102	
30/03/04	08:00	Positioned Oilphase container, commenced unloading of equipment	
	13:30	Rigged up Field Transfer equipment, performed function testing	
01/04/04	12:30	2 x Oilphase personnel arrive on Ensco 102	
	13:00	Attended complete rig safety induction, MAERSK H ₂ S training	
	15:00	Commenced Pre-checks on Wellsite chemistry equipment	
	17:00	Oilphase container powered up by rig electrician	
02/04/04	19:30	Function tested Sir Galahad Mercury analyser	
	08:00	Oilphase pressure operations, cold work permit arranged	
	09:00	Commenced pre-charge of 6 x SPMC's	
	10:00	Filled MRSC - DB34 with N ₂ , 100 psig	
	17:00	Performed Calibration 1 of Sir Galahad	
	17:49	Mercury level background check A performed on Wireline 2 ¾ gallon chamber MRSC - DB34	
	18:50	Mercury level background check B performed on Wireline 2 ¾ gallon chamber	
03/04/04	19:00	Pressure work permit closed	
	06:30	Attended Supervisors meeting with Company man	
	10:00	Filled MRSC - DB33 with N ₂ , 100 psig	
04/04/05	14:36	Commenced Mercury level background check A on Wireline 2 ¾ gallon chamber MRSC - DB33	
	15:16	Mercury level background check B performed on Wireline 2 ¾ gallon chamber	
	08:00	Prepared wellsite chemistry equipment for UOP H ₂ S analysis	
05/04/05	06:30	Attended Supervisors meeting with Company man	
06/04/05	06:30	Attended Supervisors meeting with Company man	
	06:45	Oilphase pressure operations, cold work permit arranged	
	07:00	Commenced prime pressure checks of 4 x SPMC's	
	08:45	Completed pressure check of SPMC's	
	09:00	Began loading 4 x SPMC in to MRMS - BA11 and MRMS - CA216	
	11:00	Completed loading of SPMC's	
	13:10	Commenced priming of 2 x SPMC's	
	15:00	Finished priming SPMC's	
	16:00	Prepared UOP chemicals for H ₂ S analysis	
	18:00	Completed chemistry preparations	
	18:10	Pressure work permit closed	
	07/04/05	06:30	Attended Supervisors meeting with Company man

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Sequence of Events

Date	Time	Event
<u>CHDT Logging Operations – BTA_A3</u>		
07/04/05	10:53	Pumpout started at sampling point 1
	11:42	Commenced sampling in to 2 ¾ gallon MRSC - DB34
	12:08	Completed sampling into MRSC
	12:37	Began sampling into MPSR 0497
	12:41	Finished sampling into MPSR
	12:45	Commenced sampling into MPSR 0487
	12:48	Completed sampling in to MPSR
	13:00	Diverted flow into SPMC 245
	13:02	Sampling into SPMC completed
	14:00	Wireline began POOH
	14:30	Oilphase pressure operations, cold work permit arranged
	15:11	Purged UOP Dreschels with N ₂ , 5 Litres flowed
	17:10	Opening pressure check performed on SPMC 245, 4500 psig @ 18 °C
	17:40	Partial flash performed from SPMC, H ₂ S / CO ₂ measured by stain tube
	17:53	Commenced UOP sampling from SPMC
	18:00	New pressure work permit arranged
	18:58	Finished UOP sampling, 40 Litres flowed
	19:20	Opening pressure checks performed on MRSC - DB34 and 2 x MPSR's 0497 and 0487, all 3200 psig @ 18 °C
	20:00	Began heating MRSC - DB34 to 76 °C
	21:30	Commenced UOP H ₂ S, Mercaptan and Carbonyl Sulphide analysis
	22:10	Completed H ₂ S/ Mercaptan analysis
	22:16	Began Mercury Calibration 2 on Sir Galahad
	23:00	Started Mercury sampling into gold sand trap 1 from MRSC - DB34
	23:20	Finished sampling, 10 Litres flowed
	23:25	Performed Mercury analysis on sand trap 1
	23:40	Completed Carbonyl Sulphide analysis
08/04/05	01:15	Commenced Mercury sampling into gold sand trap 2 from MRSC - DB34
	01:55	Finished sampling, 22 Litres flowed
	01:57	Performed Mercury analysis on sand trap 2
	02:10	H ₂ S / CO ₂ measured by stain tube on MRSC - DB34 from partial flash
	02:20	MRSC pressure bled down to atmosphere, remaining condensate sub sample collected
	02:40	Pressure work permit closed
	06:30	Attended Supervisors meeting with Company man

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Sequence of Events

Date	Time	Event
<u>CHDT Logging Operations – BTA_A3</u>		
08/04/05	06:50	Oilphase pressure operations, cold work permit arranged
	08:30	Started heating MPSR 0487 to reservoir temperature
	09:00	Began sample transfer of MPSR into SSB transport bottle for safe shipment to the laboratory
	09:45	Completed sample transfer
	10:00	Commenced heating MPSR 0497 to reservoir temperature
	10:30	Began sample transfer of MPSR into SSB transport bottle
	11:15	Finished sample transfer
	11:30	Pressure work permit closed
		End of Sampling Operations for BTA A3 on Ensco 102
09/04/05	07:00	Commenced rig down and pack up of Oilphase equipment
	12:00	Oilphase container made ready for back loading
	12:10	Samples made ready to ship from rig to laboratory
	12:20	Dangerous goods paperwork and shipping documentation provided to Rig logistics personnel
	14:30	2 x Oilphase personnel depart Ensco 102
10/04/05	08:30	Remaining Oilphase personnel departs Ensco 102

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Bottomhole Sample Data Sheet – Open Hole

Identification

Sample No: 1.01	Test No: N/A	Sample Nature:	Mud Sample
Bottle No:	N/A	Flow Period:	N/A
Sampling Date:	07/04/05	Transfer Date:	N/A
Sampling Time:	14:00	Transfer Time:	N/A
MRMS Serial No:	N/A	Chamber Type:	N/A
MRMS Position (Slot):	N/A	Chamber Serial No:	N/A
Sample Point:	Mud Pit	Formation:	N/A

Shipping Conditions

Sample Bottle Type:	1 Litre Plastic cont.	Gas Cap Created:	N/A
Sample Bottle Volume:	1 Litre	Fluid Remaining:	N/A
Sample Volume:	800 cc approx.	Final Pressure:	N/A @ N/A

Transfer Conditions

Initial Pressure:	N/A @ N/A	Transfer Duration:	N/A
Transfer Pressure:	N/A @ N/A	Apparent Bubble Point:	N/A @ N/A
Heating & Agitation Time:	N/A	Transfer Temperature:	N/A
GOR:	N/A Scf/Sepbbl	Oil Gravity API:	N/A
Contamination Level:	N/A		

Production Conditions During Sampling

Initial BHP:	N/A	Drawdown:	N/A
BHT:	N/A	Min BHS Pressure:	N/A
At depth:	N/A	Pump Out Duration:	N/A
Pump Out Vol:	N/A		

Remarks

Mud sample provided by Mud Engineer

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Bottomhole Sample Data Sheet – Open Hole

Identification

Sample No: 2.01	Test No: 2	Sample Nature:	Bottomhole Sample
Bottle No:	N/A	Flow Period:	N/A
Sampling Date:	07/04/05	Transfer Date:	08/04/05
Sampling Time:	11:42	Transfer Time:	02:20
MRMS Serial No:	N/A	Chamber Type:	2.75 Gal MDT
MRMS Position (Slot):	N/A	Chamber Serial No:	DB-34
Sample Point:	2674 m MD	Formation:	Latrobe Group

Shipping Conditions

Sample Bottle Type:	1 Litre Glass bottle	Gas Cap Created:	N/A
Sample Bottle Volume:	1 Litre	Fluid Remaining:	N/A
Sample Volume:	600 cc approx.	Final Pressure:	atmos. @ 18 °C

Transfer Conditions

Initial Pressure:	3215 psia @ 18 °C	Transfer Duration:	5 mins
Transfer Pressure:	atmos. @ 18 °C	Apparent Bubble Point:	N/A @ N/A
Heating & Agitation Time:	6 hrs	Transfer Temperature:	76 °C
GOR:	N/A Scf/Sepbbl	Oil Gravity API:	N/A
Contamination Level:	N/A		

Production Conditions During Sampling

Initial BHP:	3752.45 psia	Drawdown:	5.33 psi
BHT:	122.4 °C	Min BHS Pressure:	3747.12 psia
At depth:	2674 m MD	Pump Out Duration:	49 mins
Pump Out Vol:	39.77 Litres		

Remarks

Sample captured at request of Geologist
 Bottomhole data obtained during sampling from Wireline

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Bottomhole Sample Data Sheet – Open Hole

Identification

Sample No: 2.02	Test No: 2	Sample Nature:	Bottomhole Sample
Bottle No:	10005-MA	Flow Period:	N/A
Sampling Date:	07/04/05	Transfer Date:	08/04/05
Sampling Time:	12:37	Transfer Time:	10:30
MRMS Serial No:	CA-216	Chamber Type:	MPSR
MRMS Position (Slot):	1	Chamber Serial No:	0497
Sample Point:	2674 m MD	Formation:	Latrobe Group

Shipping Conditions

Sample Bottle Type:	Single Phase (SSB)	Gas Cap Created:	60 cc (Nitrogen)
Sample Bottle Volume:	820 cc	Fluid Remaining:	395 cc (Water/ Glycol)
Sample Volume:	365 cc	Final Pressure:	6015 psia @ 18 °C

Transfer Conditions

Initial Pressure:	3215 psia @ 18 °C	Transfer Duration:	30 mins
Transfer Pressure:	7015 psia @ 100 °C	Apparent Bubble Point:	N/A @ N/A
Heating & Agitation Time:	30 mins	Transfer Temperature:	100 °C
GOR:	N/A Scf/Sepbbl	Oil Gravity API:	N/A
Contamination Level:	N/A		

Production Conditions During Sampling

Initial BHP:	3752.45 psia	Drawdown:	4.95 psi
BHT:	122.64 °C	Min BHS Pressure:	3747.50 psia
At depth:	2674 m MD	Pump Out Duration:	104 mins
Pump Out Vol:	61.11 Litres		

Remarks

Sample captured at request of Geologist
 Bottomhole data obtained during sampling from Wireline

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Well: BTA_A3
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Bottomhole Sample Data Sheet – Open Hole

Identification

Sample No: 2.03	Test No: 2	Sample Nature:	Bottomhole Sample
Bottle No:	10001-MA	Flow Period:	N/A
Sampling Date:	07/04/05	Transfer Date:	08/04/05
Sampling Time:	12:45	Transfer Time:	09:00
MRMS Serial No:	CA-216	Chamber Type:	MPSR
MRMS Position (Slot):	4	Chamber Serial No:	0487
Sample Point:	2674 m MD	Formation:	Latrobe Group

Shipping Conditions

Sample Bottle Type:	Single Phase (SSB)	Gas Cap Created:	60 cc (Nitrogen)
Sample Bottle Volume:	820 cc	Fluid Remaining:	390 cc (Water/ Glycol)
Sample Volume:	370 cc	Final Pressure:	6015 psia @ 18 °C

Transfer Conditions

Initial Pressure:	3215 psia @ 18 °C	Transfer Duration:	30 mins
Transfer Pressure:	7015 psia @ 100 °C	Apparent Bubble Point:	N/A @ N/A
Heating & Agitation Time:	30 mins	Transfer Temperature:	100 °C
GOR:	N/A Scf/Sepbbl	Oil Gravity API:	N/A
Contamination Level:	N/A		

Production Conditions During Sampling

Initial BHP:	3752.45 psia	Drawdown:	4.68 psi
BHT:	122.66 °C	Min BHS Pressure:	3747.77 psia
At depth:	2674 m MD	Pump Out Duration:	112 mins
Pump Out Vol:	64.02 Litres		

Remarks

Sample captured at request of Geologist
 Bottomhole data obtained during sampling from Wireline

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MDT Sampling Toolstring

MDT - MRMS Modules

MRMS 1 - S/N: MRMS BA 11

Position	Sampler Type	Serial No	N2 Press. (psig)	Trapped Vol* (cc)
1	MPSR	0113	N/A	11.1
2	SPMC	247	10,000	10.2
3	SPMC	248	10,000	7.2
4	MPSR	0186	N/A	12.5
5	MPSR	0286	N/A	12.0
6	MPSR	0477	N/A	10.3

MRMS 2 - S/N: MRMS CA 216

Position	Sampler Type	Serial No	N2 Press. (psig)	Trapped Vol* (cc)
1	MPSR	0497	N/A	11.1
2	SPMC	245	10,000	10.2
3	SPMC	180	10,000	7.2
4	MPSR	0487	N/A	12.5
5	MPSR	066	N/A	12.0
6	MPSR	0498	N/A	10.3

*NB: "Trapped Vol" is the volume of distilled water present between the "NC" valve and the sample piston that will report to the sample chamber on the commencement of sampling

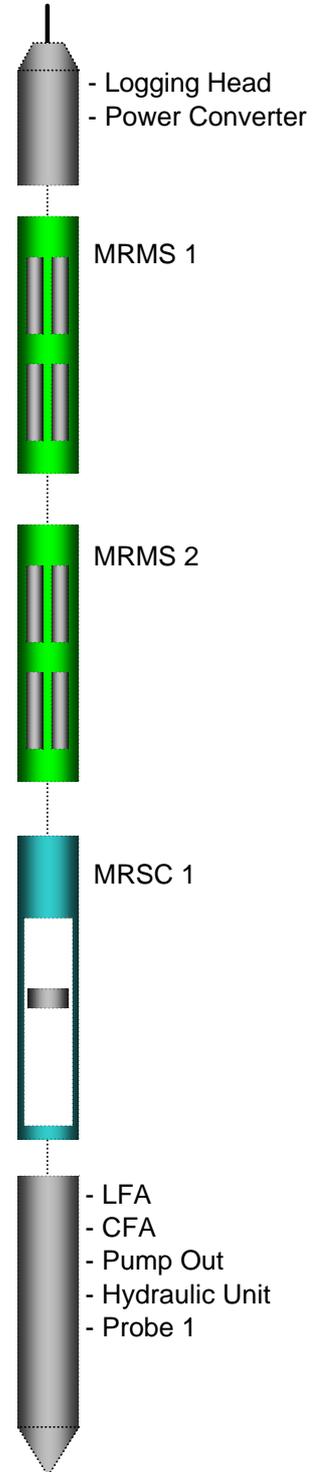
Tools configured for **Low Shock** sampling

SPMC Charge Parameters

Estimated Bottomhole Pressure	4,200	psia
Estimated Bottomhole Temp	100	°C
Expected Fluid Type	Dry Gas	
Assumed Fluid Shrinkage	40	%
Calc'd Recovery Pressure at T(amb)	6,000	psig

MDT - MRSC Modules

Module No	Type	Serial No	Volume (Gal)	Agitation Ring?
1	DB	34	2.75 gal	N
2	not run			
3	not run			



Remarks

MDT Toolstring run in hole on Wireline
 NR-SPMC's used to minimise H2S loss

Client: Esso Australia Pty Ltd
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Sampling Results

Sample No	Sampling Date	Sampling Time	Sample Type	Sample Point	Opening Press (psig @ deg C)	H2S (stain tube) (ppm-vol)	H2S (UOP) (ppm-vol)	CO2 Measured (%)	Mercury (Hg) (ng/ m3 @ std. cond)	Transfer Vol (cc)	Remarks
CHDT Run 2											
1.01	07-Apr-05	14:00	Mud Sample	Mud Pit	N/A	N/A	N/A	N/A	N/A	N/A	Mud sample provided by Mud Engineer
2.01	07-Apr-05	11:42	2 3/4 Gallon MRSC - DB 034	2674 m MD	3,200 @ 18	0.7 ppm	N/A	5.2%	72.35	N/A	Mercury (Hg) measured by Atomic Fluorescence (Sir Galahad) H2S/ CO2 measured by stain tube 600 cc condensate sub sample collected
2.02	07-Apr-05	12:37	MPSR 0497	2674 m MD	3,200 @ 18	N/A	N/A	N/A	N/A	365 cc	High compressibility is indicative of the presence of gas in the sample, 365 cc volume at 6000 psig
2.03	07-Apr-05	12:45	MPSR 0487	2674 m MD	3,200 @ 18	N/A	N/A	N/A	N/A	370 cc	High compressibility is indicative of the presence of gas in the sample, 370 cc volume at 6000 psig
2.04	07-Apr-05	13:00	NR-SPMC 245	2674 m MD	4,500 @ 18	0.3 ppm	BDL	5.5%	N/A	40 L @ atmos.	Partial Flash performed and evolved gas captured - H2S/CO2 in gas phase measured by stain tube Remaining sample flowed through

BDL = Below Detectable Limit