Western Underground
Gas Storage Pty. Ltd.

TXU

WELL COMPLETION REPORT

Iona-4

PPL2
ONSHORE OTWAY BASIN, VICTORIA

VOLUME 2 OF 3
APPENDICES 8-10 & ENCLOSURES 1-4

October 1999

Copy 3 of 6

Western Underground
Gas Storage Pty. Ltd.

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VOLUME 2 OF 3
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APPENDICES

Appendix 8 Test report by Haliburton

Appendix 9 Drilling fluid recap by Baroid

Appendix 10 Directional Drilling end of well report by Sperry Sun

ENCLOSURES

Enclosure 1. Formation Evaluation Log (mudlog) by Halliburton

Enclosure 2. Well Composite Log by PetroVal Australasia Pty Ltd

Enclosure 3. Well Composite Log - Reservoir Section by PetroVal Australasia Pty Ltd

Enclosure 4a. Field Logs - DSI – GR 1:200
Enclosure 4b. Field Logs - DSI – GR 1:500

APPENDIX 8

Test report by Haliburton

WELL TEST DATA REPORT

COMPANY : WESTERN UNDERGROUND GAS STORAGE PTY LTD

WELL : IONA 4

TEST NO. : PRODUCTION FLOWBACK TESTS

DATE : 30-MARCH-99 TO 19-APRIL-99

HALLIBURTON

HALLIBURTON

23rd APRIL. 1999

WESTERN UNDERGROUND GAS STORAGE PTY LTD
LEVEL 49, 525 COLLINS STREET
MELBOURNE 3000
VICTORIA
AUSTRALIA

Attention: Petroleum Operations and Quality Systems Superintendent.

Dear Sir,

Please find enclosed the report for the PRODUCTION TESTS conducted on IONA - 1,2,3 and 4 during the period 30th March to 6th April and 19th April 1999.

We trust this report is complete and to your satisfaction. Should you have any questions please do not hesitate to contact us.

It has been a pleasure to be of service to you and we hope to have the opportunity to do so again in the future.

Yours sincerely

GARY GIANCASPRO
Data Acquisition Specialist
HALLIBURTON AUSTRALIA PTY LTD

DISCLAIMER

These calculations are based on certain data, assumptions and applied mathematical methods. Inaccurate well data, changing well conditions, tolerance variations of mechanical components, mechanical malfunctions and other factors may affect these calculations.

HALLIBURTON AUSTRALIA PTY. LTD. ('H.E.S')

MAKES NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY OF THE DATA, CALCULATIONS OR OPINIONS EXPRESSED HEREIN, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. USER AGREES BY ITS USE THEREOF THAT USER WILL RELEASE, INDEMNIFY ANY COSTS RELATED THERE TO ARISING OUT OF OR IN CONNECTION WITH SUCH USE AND INCURRED BY USER OR THIRD PARTIES, WHETHER DUE TO NEGLIGENCE OR OTHERWISE.

INDEX

IONA PRODUCTION TESTS

TEST EQUIPMENT

IONA - PRODUCTION TESTS

CHOKE MANIFOLD FOLEY 3 1/16" 10,000 PSI

SEPARATOR 10' X 48" 1440 PSI 12,000 bbl/d OIL
80 MMSCF/D GAS 2,500 bbl/d H2O

1 X HALLIBURTON HYDRAULIC FLOW WING SAFETY VALVE

TEXSTEAM & HASKELL CHEMICAL INJECTION PUMPS

ASSOCIATED PIPEWORK AND COFLEXIP HOSE(S)

S.T.E TEST LABORATORY

SURFACE COMPUTER ACQUISITION NETWORK ($SCAN_2$) UNIT

METERS:

GAS - DANIELS 5.761" METER RUN
BARTON RECORDER

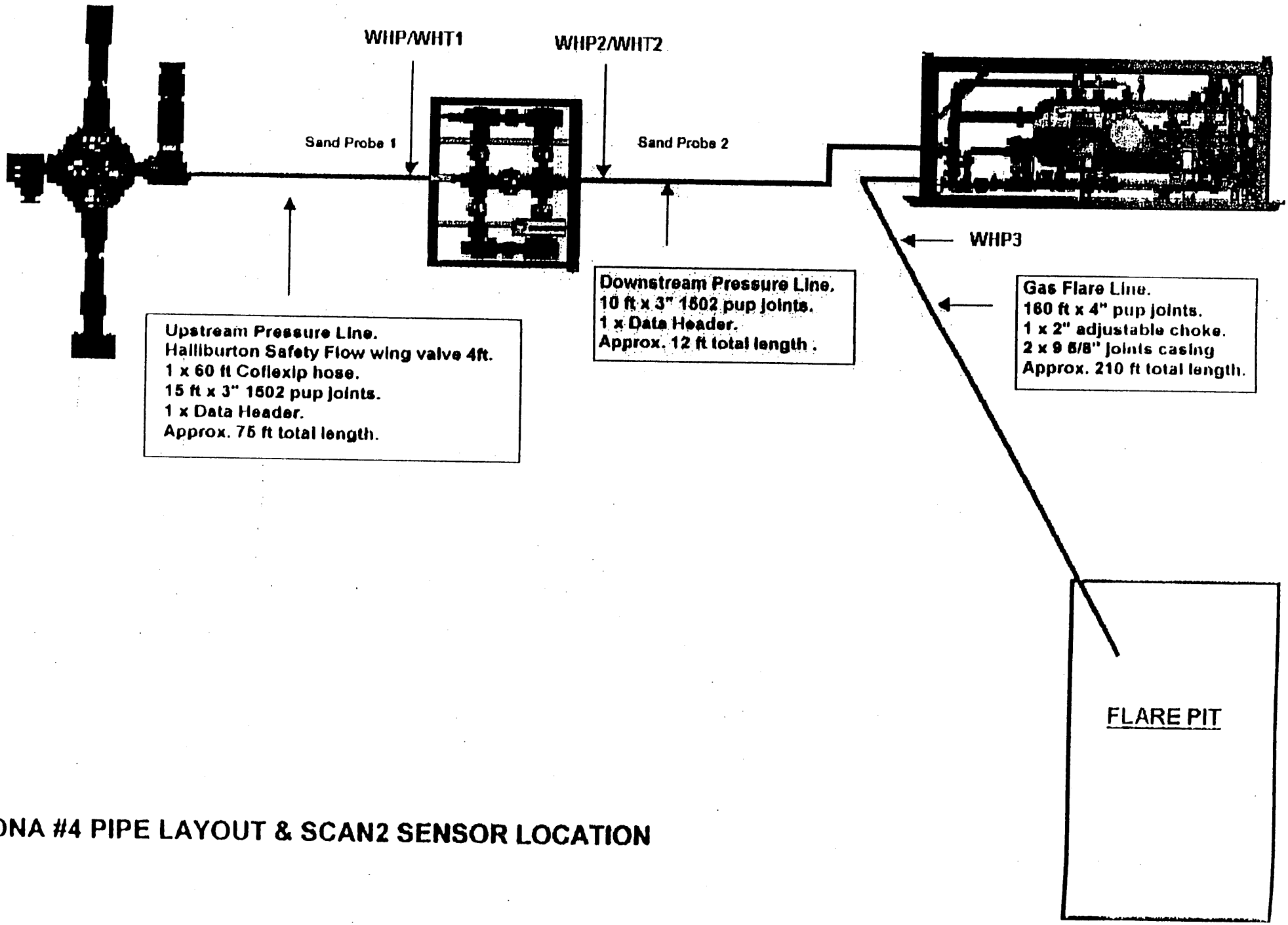
2.0" OIL - TURBINE - 515 - 6,000 bbl/d
3.0" OIL - TURBINE - 2,100 - 21,000 bbl/d

WATER - TURBINE 1" 170 - 1,700 bbl/d

FLOWLINE - PRODUCTION TREE TO CHOKE MANIFOLD

IONA - PRODUCTION TESTS

ITEM	DESCRIPTION	ID (Inches)	LENGTH (Ft)
1	COFLEXIP HOSE	2.50	60.0
2	DATA HEADER	3.00	2.75
3	CHOKE MANIFOLD TO BEAN	3.00	2.90



IONA #4 PIPE LAYOUT & SCAN2 SENSOR LOCATION

908910 011

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT	CSG	GAS	OIL	WATER	GOR	PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	
[illegible]	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°f)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°f)	(Air=1)	
30-Mar 15:00			14	58.2															
30-Mar 15:01				58.1															
30-Mar 15:02			14	58.1															
30-Mar 15:03				57.9															
30-Mar 15:04			41	57.8															
30-Mar 15:05			14	57.6															
30-Mar 15:06			10	57.6															
30-Mar 15:07			42	57.4															Dropped TCP bar to fire guns
30-Mar 15:08			06	57.4															
30-Mar 15:09			15	57.2															
30-Mar 15:10			90	57.2															Indication of guns fired
30-Mar 15:11			164	57.1	10.8														
30-Mar 15:12			880	57.0	38.3														
30-Mar 15:13			824	57.0	50.9														
30-Mar 15:14			856	56.9	60.3														
30-Mar 15:15	32		899	56.9	66.2														Opened well to flare on 32/64" adj choke
30-Mar 15:16	32		968	56.8	84.6														
30-Mar 15:17	32		1196	57.5	93.2														
30-Mar 15:18	32		1472	59.0	104.3														

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

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WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT	CSG	GAS	OIL	WATER	GOR	PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	
	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°f)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°f)	(Air=1)	
30 Mar 15:19	32		175.9	60.5	113.8														
30 Mar 15:20	32		208.5	62.1	123.2														Flowed brine to flare pit
30 Mar 15:21	32		243.6	63.5	132.0														
30 Mar 15:22	32		280.9	64.8	140.4														
30 Mar 15:23	32		323.7	65.9	149.5														
30 Mar 15:24	32		365.0	67.1	158.8														
30 Mar 15:25	32		409.7	68.2	165.1														
30 Mar 15:26	32		457.9	69.2	174.5														
30 Mar 15:27	32		507.7	70.2	183.0														
30 Mar 15:28	32		559.6	71.2															
30 Mar 15:29	32		614.0	72.1	196.8														
30 Mar 15:30	32		667.4	73.0	204.6														Gas to surface
30 Mar 15:31	32		718.2	73.7	211.5														
30 Mar 15:32	32		775.3	74.5	218.0														
30 Mar 15:33	32		832.4	75.2	223.1														
30 Mar 15:34	32		891.0	75.9	228.9														
30 Mar 15:35	32		950.0	76.6	233.7														
30 Mar 15:36	32		1015.2	77.3	237.5														
30 Mar 15:37	32		1076.0	77.9	240.7														

HALLIBURTON

WELL TEST DATA SHEET

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DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT	CSG	GAS	OIL	WATER	GOR	PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	
	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°f)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°f)	(Air=1)	
30-Mar 15:38	32		1140 6	78 6	244.1														
30-Mar 15:39	32		1201 2	79 2	245.8														
30-Mar 15:40	32		1252 1	79 7	245.1														
30-Mar 15:44	40		1374 8	80 9	243 8														Increased choke to 40/64"adj choke
30-Mar 15:45	40		1399 3	80 9	244.1														Commenced Methanol injection
30-Mar 15:50	40		1333 7	79 7	266 6														CO2 = 7% H2S = 0,ppm
30-Mar 15:55	48		1420 9	79.3	284.5														Increased choke to 48/64" adjustable
30-Mar 16:00	48	99 5	1407.8	79 5	301.4														BS&W = 99.5% H2O with 0.5% pipe dope/sediment
30-Mar 16:05	48		1433 1	79 7	322.9														
30-Mar 16:07	56	82 0	1444 1	79 8	329.1														BS&W = 80% H2O and 2% sediment
30-Mar 16:10	56		1408 0	79 9	337.1														
30-Mar 16:15	56		1403 9	80 6	359.0														
30-Mar 16:20	56		1405 3	81 1	380.4														CO2 = 4%
30-Mar 16:25	56	76 0	1414 0	81 7	398 9														BS&W = 75% H2O and 1% sediment
30-Mar 16:30	56		1421 1	82 2	417.8														Diverted flow through separator
30-Mar 16:35	56		1416 3	82 5	434 2														Separator block valve worked closed - diverted flow out of and back into
30-Mar 16:40	56		1424 0	82 4	449 3														
30-Mar 16:45	56		1415 3	82 4	464 4														
30-Mar 16:48	64		1407 8	82 6	473 9														Increased choke to 64/64" adjustable

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australla

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT	CSG	GAS	OIL	WATER	GOR	PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	
	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°f)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°f)	(Air=1)	
30 Mar 16:50	72		1352.0	82.7	476.6														Increased choke to 72/64" adjustable
30 Mar 16:51	72			82.7	476.9														Suspect WHP transducer - changed out - readings n/a
30 Mar 16:55	72			83.0	491.2														
30-Mar 16:59	84			83.4	503.5														Increased choke to 84/64" adjustable
30 Mar 17:00	84			83.4	505.7														Stopped Methanol injection at choke manifold
30 Mar 17:05	84			83.8	520.1														
30 Mar 17:07	84			84.0	526.5														Installed 3.750" orifice plate
30 Mar 17:10	84			84.3	534.3	49.26				1009.4	75.6			0.102					
30-Mar 17:15	84			84.7	545.9														CO2 = 5.5% H2S = 0 ppm.
30 Mar 17:20	84		1229.9	85.5	557.1	49.54				1016.7	76.7			0.442					Pressure transducer changed out - WHP readings online again
30 Mar 17:25	84		1237.5	85.9	567.1	49.73				1019.6	77.2			0.614					
30-Mar 17:30	84		1225.7	86.3	577.3	50.08				1021.2	77.6			0.788				0.678	Gas gravity = 0.678
30 Mar 17:35	84		1235.4	86.6	585.7	49.73				1021.8	78.0			0.962					
30 Mar 17:40	84		1225.5	86.9	593.1	50.02				1020.8	78.3			1.133					
30 Mar 17:45	84		1219.2	87.2	600.8	50.95				989.1	77.5			1.309					CO2 = 7.0% H2S = 0 ppm
30 Mar 17:50	84		1218.9	87.4	607.5	50.77				990.6	77.7			1.485					BS&W not available - not enough fluid at choke
30 Mar 17:55	84		1225.7	87.5	613.0	50.80				988.0	78.0			1.661					
30 Mar 18:00	84		1230.7	87.7	618.0	50.84				990.8	78.1			1.839				0.678	Gas gravity = 0.678
30 Mar 18:05	84		1214.7	87.8	624.9	51.01				992.5	78.3			2.016					

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HALLIBURTON

WELL TEST DATA SHEET

BASE: Australla

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE (64ths)	BS&W (%)	WHP (psig)	WHT (°F)	CSG (psig)	GAS (MMscfd)	OIL (bpd)	WATER (bpd)	GOR mscf/bbl	PRES. (psig)	TEMP. (°f)	BS&W (%)	WCT (%)	GAS (MMscf)	OIL (bbls)	WATER (bbls)	OIL (API@60°f)	GAS (Air=1)	
30 Mar 18:10	84		1245.0	88.0	629.6	51.05				993.3	78.5			2.191					
30 Mar 18:15	84		1233.3	88.2	634.7	50.90				993.3	78.8			2.369					
30 Mar 18:20	84		1236.2	88.3	638.3	50.88				993.4	78.9			2.546					
30 Mar 18:25	84		1220.8	88.6	642.9	51.06				991.8	78.9			2.721					
30 Mar 18:30	84		1222.9	88.8	647.7	51.02				994.9	79.2			2.898				0.678	Commenced taking 1st H.P gas sample
30 Mar 18:35	84		1244.8	88.8	652.1	51.15				995.5	79.4			3.078					
30 Mar 18:40	84		1245.3	88.9	654.6	51.31				996.1	79.5			3.258					Finished taking 1st H.P gas sample
30 Mar 18:45	84		1223.2	89.1	659.6	51.19				996.0	79.6			3.437				0.678	Commenced taking 2nd H.P gas sample
30 Mar 18:50	84		1235.6	89.3	662.0	50.96				996.1	79.8			3.613					
30 Mar 18:55	84		1225.9	89.5	665.7	50.91				996.9	79.9			3.790					Finished taking 2nd H.P gas sample
30 Mar 19:00	84		1248.4	89.5	668.0	50.96				996.3	80.1			3.966					Lifted 3.750" orifice plate
30 Mar 19:01	84		1217.7	89.5	669.1														
30 Mar 19:02	84		1225.1	89.5	669.2														
30 Mar 19:03	84		1244.6	89.5	669.5														
30 Mar 19:04			1257.7	89.5	670.0														Closed well in at choke manifold
30 Mar 19:05			1230.1	89.5	671.4														
30 Mar 19:06			1508.6	90.1	682.2														
30 Mar 19:07			1501.3	90.3	679.8														
30 Mar 19:08			1501.9	90.1	676.3														

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15.00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT	CSG	GAS	OIL	WATER	GOR	PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	
	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°f)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°f)	(Air=1)	
30 Mar 19.09			1502.3	89.8	673.0														
30-Mar 19.10			1502.1	89.3	668.0														
30 Mar 19.11			1502.3	88.9	663.7														
30-Mar 19.12			1500.6	88.4	660.2														
30 Mar 19.13			1501.1	88.0	655.6														
30 Mar 19.14			1501.7	87.5	651.4														
30 Mar 19.15			1500.8	87.0	648.1														
30 Mar 19.20			1502.1	84.5	629.7														R.I.H with XXN plug
30 Mar 19.25			1501.5	81.9	612.9														
30 Mar 19.30			1499.6	79.4	597.4														
30 Mar 19.35			1500.0	76.7	583.8														
30 Mar 19.40			1500.0	74.5	571.1														
30 Mar 19.45			1500.2	72.5	559.7														
30 Mar 19.50			1500.2	70.8	547.9														
30 Mar 19.55			1499.8	69.0	537.4														Plug set - P.O.O.H
30 Mar 20.00			1499.6	67.5	526.4														
30 Mar 20.05			1496.6	66.2	517.0														
30 Mar 20.10			1497.9	65.1	507.9														
30 Mar 20.15			1494.5	64.1	499.0														

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15.00 - 31-Mar 07:00
RIG : O D E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT	CSG	GAS	OIL	WATER	GOR	PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	
Elapsed Time	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°f)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°f)	(Air=1)	
30-Mar 20 20			1494 9	63 1	490 6														
30-Mar 20 25			1488 6	62.3	481.6														
30-Mar 20 30			947 8	61 0	473.7														
30-Mar 20 34				58.6	467.0														O.O.H - Closed L.M.V and bled off lubricator
30-Mar 20 35				58 3	465.8														
30-Mar 20 40				57 7	458 4														
30 Mar 20 45			1471 2	60.0	448.6														
30-Mar 20 50			1393 9	61 9	430.6														Opened swab valve - bled tubing down to 1000 psi
30 Mar 20 55			1324 6	64 0	412.5														
30 Mar 21 00			1261 9	65 5	397.1														
30 Mar 21 05			1205 7	66 6	382 4														
30 Mar 21 10			1138 1	67 3	367.7														
30 Mar 21 15			1057 5	68 1	351 2														
30 Mar 21 20			978 7	68 8	335.4														
30 Mar 21 21			959 8	69 0	332 0														
30 Mar 21 22			943 4	69 1	327 9														Monitored tubing pressure for 15 minutes
30 Mar 21 23			947 0	69 1	327.1														
30 Mar 21 24			948 2	69 0	326 6														
30 Mar 21 25			948 6	68 8	325 3														

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT	CSG	GAS	OIL	WATER	GOR	PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	
[illegible]	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°f)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°f)	(Air=1)	
30-Mar 21 26			948 8	68.6	325 1														
30 Mar 21 27			948 4	68 4	324 2														
30 Mar 21 28			946 3	68.1	323 8														
30 Mar 21 29			948 8	67 9	323.3														
30 Mar 21 30			947 2	67 7	322 0														
30 Mar 21 31			949 7	67 4	321.8														
30 Mar 21 32			947 4	67 1	321.4														
30 Mar 21 33			948 4	66 9	320.5														
30 Mar 21 34			948 6	66 6	319 9														
30 Mar 21 35			948 2	66 4	319 0														
30 Mar 21 36			951 6	66 2	318.2														
30 Mar 21 37			950 5	66 0	318.0														
30 Mar 21 38			948 4	65 8	316.9														
30 Mar 21 39			947 4	65 5	315 9														
30 Mar 21 40			948 6	65 3	315 2														
30 Mar 21 41			947 8	65 1	314 8														
30 Mar 21 42			948 2	64 8	314 7														
30 Mar 21 43			947 8	64 6	313 0														
30 Mar 21 44			948 2	64 5	312 4														

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE			FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE (64ths)	BS&W (%)	WHP (psig)	WHT (°F)	CSG (psig)	GAS (MMscfd)	OIL (bpd)	WATER (bpd)	GOR mscf/bbl	PRES. (psig)	TEMP. (°F)	BS&W (%)	WCT (%)	GAS (MMscf)	OIL (bbls)	WATER (bbls)	OIL (API@60°F)	GAS (Air=1)	
30-Mar 21:45			948.8	64.2	312.7														Plug held OK
30-Mar 21:50			949.1	63.1	308.6														
30-Mar 21:53			946.9	62.5	305.9														Rigged down slickline lubricator
30-Mar 21:55			945.7	62.1	304.3														
30-Mar 22:00			943.2	61.1	300.0														
30-Mar 22:15			936.8	58.4	290.2														
30-Mar 22:30			931.4	56.6	280.1														
30-Mar 22:45			922.5	55.5	267.3														
30-Mar 23:00			776.0	54.4	204.4														Completed filling tubing with brine above plug - 75 bbls
30-Mar 23:15			1413.9	54.1	160.2														Pressured up tubing to 2000 psi
30-Mar 23:20			1959.6	54.3	178.9														
30-Mar 23:21			1953.0	54.4	175.8														
30-Mar 23:22			1951.2	54.3	172.2														
30-Mar 23:23			1954.5	54.3	169.8														
30-Mar 23:24			1954.1	54.3	167.0														
30-Mar 23:25			1954.5	54.3	165.6														Bled down tubing to flare
30-Mar 23:30			1964.4	54.1	165.4														
30-Mar 23:31			1859.4	54.1	141.4														
30-Mar 23:32			1785.0	54.5	141.5														

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE (64ths)	BS&W (%)	WHP (psig)	WHT (°F)	CSG (psig)	GAS (MMscfd)	OIL (bpd)	WATER (bpd)	GOR mscf/bbl	PRES. (psig)	TEMP. (°f)	BS&W (%)	WCT (%)	GAS (MMscf)	OIL (bbls)	WATER (bbls)	OIL (API@60°f)	GAS (Air=1)	
30 Mar 23:33			1734.5	54.9	139.4														
30 Mar 23:34			1728.0	55.4	137.9														
30 Mar 23:35			1723.8	55.7	137.6														
30 Mar 23:36			1561.9	56.1	126.8														
30 Mar 23:37			1502.5	56.7	122.3														
30 Mar 23:38			1509.5	57.3	122.6														
30 Mar 23:39			1516.2	57.6	123.5														
30 Mar 23:40			1520.0	57.9	125.1														
30 Mar 23:41			1522.9	58.1	126.2														
30 Mar 23:42			1518.5	58.4	126.6														
30 Mar 23:43			1523.8	58.6	127.2														
30 Mar 23:44			1525.7	58.8	128.0														Closed choke to allow gas to break out of brine
30 Mar 23:45			1528.8	58.9	128.3														
30 Mar 23:50			1545.0	58.9	130.9														
30 Mar 23:55			1561.3	58.6	132.1														
31 Mar 00:00			1575.6	58.1	133.6														
31 Mar 00:05			1587.8	57.5	134.7														
31 Mar 00:10			1601.0	57.0	134.7														
31 Mar 00:15			1612.0	56.5	135.0														

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15.00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT	CSG	GAS	OIL	WATER	GOR	PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	
	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°F)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°F)	(Air=1)	
31 Mar 00 16			1595 0	56 4	132 3														Opened choke to bleed down tubing again
31-Mar 00 17			1572 0	56 4	132.2														
31-Mar 00 18			1558 7	56.7	130.8														
31-Mar 00 19			1504 0	57.1	126.4														
31 Mar 00 20			1447 6	57 8	121.3														Closed choke - no gas at surface (WHP = 1450 psi)
31 Mar 00 25			1431 8	60 1	120 5														
31-Mar 00 30			1444 2	60 7	122 6														
31-Mar 00 35			1454 7	60 6	123.6														Increased tubing pressure to 2000 psi (WHP = 1458 psi)
31 Mar 00 36			1455 2	60 5	123 9														
31 Mar 00 37			1550 3	60 4	131 3														
31 Mar 00 38			1600 2	60 3	133 0														
31 Mar 00 39			1728 8	60 1	142 3														
31 Mar 00 40			1815 6	60 0	150 5														WHP = 1980 psi - Pumped another 10 bbls
31 Mar 00 41			1964 6	59 9	156 6														
31 Mar 00 42			1975 4	59 7	157 7														
31 Mar 00 43			1971 4	59 6	157 0														
31 Mar 00 44			1968 6	59 5	155 6														
31 Mar 00 45			1967 2	59 3	153 6														
31 Mar 00 46			1967 8	59 1	152.7														

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HALLIBURTON

WELL TEST DATA SHEET

BASE: Australla

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT	CSG	GAS	OIL	WATER	GOR	PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	
	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°f)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°f)	(Air=1)	
31-Mar 00:47			1968.2	59.0	151.7														
31-Mar 00:48			1969.0	58.8	151.0														
31-Mar 00:49			1971.4	58.6	150.3														
31-Mar 00:50			1971.4	58.5	149.7														
31-Mar 00:55			1979.6	57.7	148.0														
31-Mar 01:00			1988.4	56.8	147.4														
31-Mar 01:05			1997.0	55.9	147.2														
31-Mar 01:10			2006.5	55.1	147.1														Opened choke to flare - no gas
31-Mar 01:15			1895.4	54.5	137.6														
31-Mar 01:16			1814.3	55.0	131.0														Closed choke
31-Mar 01:17			1781.5	55.7	127.3														
31-Mar 01:18			1786.7	56.1	128.3														
31-Mar 01:19			1791.8	56.4	129.0														
31-Mar 01:20			1794.3	56.6	129.2														
31-Mar 01:25			1805.9	57.3	130.9														
31-Mar 01:30			1817.0	57.5	130.9														
31-Mar 01:35			1828.4	57.1	131.8														
31-Mar 01:40			1836.6	56.5	131.7														
31-Mar 01:45			1843.8	56.1	131.6														

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australla

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT	CSG	GAS	OIL	WATER	GOR	PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	
[illegible]	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°f)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°f)	(Air=1)	
31 Mar 01:50			1854.9	55.6	130.8														
31-Mar 01:55			1780.2	55.1	126.7														Opened choke to flare
31-Mar 01:56			1771.0	55.0	126.8														
31 Mar 01:57			1764.8	54.9	125.5														
31 Mar 01:58			1760.0	54.8	124.8														
31-Mar 01:59			1753.5	54.6	124.6														
31 Mar 02:00			1749.9	54.5	124.6														
31 Mar 02:05			1643.8	54.5	115.8														
31 Mar 02:10			1402.1	58.0	95.1														Flare pilot out - closed choke
31 Mar 02:15			1395.0	61.0	95.6														Relit pilot OK
31 Mar 02:20			1277.0	62.5	85.8														Opened choke to flare
31-Mar 02:21			1250.1	63.0	83.2														
31 Mar 02:22			1220.6	63.5	80.4														
31 Mar 02:23			1194.9	64.0	77.7														
31 Mar 02:24			1172.4	64.4	75.7														
31 Mar 02:25			1151.4	64.9	73.6														
31 Mar 02:30			1054.9	66.7	64.3														
31 Mar 02:35			986.3	68.0	56.7														
31 Mar 02:40			929.3	68.7	48.1														

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australla

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE SIZE (64ths)	CHOKE BS&W (%)	CHOKE WHP (psig)	CHOKE WHT (°F)	CHOKE CSG (psig)	FLOW RATES GAS (MMscfd)	FLOW RATES OIL (bpd)	FLOW RATES WATER (bpd)	FLOW RATES GOR mscf/bbl	SEPARATOR PRES. (psig)	SEPARATOR TEMP. (°f)	SEPARATOR BS&W (%)	SEPARATOR WCT (%)	CUMMLATIVE GAS (MMscf)	CUMMLATIVE OIL (bbls)	CUMMLATIVE WATER (bbls)	SPECIFIC GRAVITY OIL (API@60°f)	SPECIFIC GRAVITY GAS (Air=1)	REMARKS
31 Mar 02:45			889.1	69.3	40.5														
31 Mar 02:50			841.9	69.6	32.1														
31 Mar 02:55			747.2	69.4	21.3														
31 Mar 03:00			630.7	68.0	12.6														
31 Mar 03:05			527.0	66.4	7.1														WHP = 500 psi - closed choke
31 Mar 03:10			497.1	65.0	6.8														Started pumping fluid into tubing
31 Mar 03:11			497.9	64.7	6.4														Total fluid pumped into tubing = 134 bbls
31 Mar 03:15			465.3	63.7	7.4														
31 Mar 03:20			371.4	62.3	4.7														
31 Mar 03:25			310.7	61.0	1.1														
31 Mar 03:30			307.6	60.0															Stopped pumping into tubing
31 Mar 03:35			421.0	59.0															
31 Mar 03:40			481.9	58.2															
31 Mar 03:45			489.1	57.3															
31 Mar 03:50			497.7	56.5															
31 Mar 03:55			507.6	55.8															
31 Mar 04:00			519.6	55.2															
31 Mar 04:05			518.5	54.6															Opened choke to bleed off tubing
31 Mar 04:10			460.6	56.1															

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australla

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT	CSG	GAS	OIL	WATER	GOR	PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	
(dd mmm hh:mm)	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°f)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°f)	(Air=1)	
31 Mar 02 45			889 1	69.3	40.5														
31-Mar 02 50			841.9	69.6	32.1														
31-Mar 02 55			747 2	69.4	21.3														
31-Mar 03 00			630 7	68 0	12.6														
31-Mar 03 05			527 0	66 4	7.1														WHP = 500 psi - closed choke
31-Mar 03 10			497.1	65.0	6.8														Started pumping fluid into tubing
31 Mar 03 11			497 9	64.7	6.4														Total fluid pumped into tubing = 134 bbls
31-Mar 03 15			465.3	63 7	7.4														
31-Mar 03 20			371 4	62 3	4.7														
31-Mar 03 25			310 7	61.0	1.1														
31-Mar 03 30			307 6	60.0															Stopped pumping into tubing
31-Mar 03 35			421 0	59 0															
31-Mar 03 40			481 9	58.2															
31 Mar 03 45			489 1	57 3															
31-Mar 03 50			497 7	56 5															
31-Mar 03 55			507 6	55 8															
31 Mar 04 00			519 6	55 2															
31-Mar 04 05			518 5	54 6															Opened choke to bleed off tubing
31 Mar 04 10			460 6	56 1															

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HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE (64ths)	BS&W (%)	WHP (psig)	WHT (°F)	CSG (psig)	GAS (MMscfd)	OIL (bpd)	WATER (bpd)	GOR mscf/bbl	PRES. (psig)	TEMP. (°f)	BS&W (%)	WCT (%)	GAS (MMscf)	OIL (bbls)	WATER (bbls)	OIL (API@60°f)	GAS (Air=1)	
31-Mar 04 15			474 1	56 6															
31-Mar 04 20			487.6	56.5															
31-Mar 04 25			503.0	56 2															
31-Mar 04 30			516 0	55 8															
31-Mar 04 32			522.9	55.6															Bled down tubing to flare
31-Mar 04 33			525 3	55.5															
31-Mar 04 34			528.2	55.5															
31-Mar 04 35			521.5	55.5															Closed choke - no gas - monitored for 30 minutes
31-Mar 04 36			510.5	55.6															
31-Mar 04 37			496 6	56.1															
31-Mar 04 38			497 9	56.5															
31-Mar 04 39			497.9	56.7															
31-Mar 04 40			506.1	56.8															
31 Mar 04 45			524 8	57.2															
31-Mar 04 50			537 5	57 0															
31-Mar 04 55			556 2	56 6															
31-Mar 05 00			557 9	56 1															Small shows of gas at flare
31 Mar 05 05			491 2	56 6															
31 Mar 05 10			468 2	57 8															

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	CHOKE					FLOW RATES				SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT	CSG	GAS	OIL	WATER	GOR	PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	
(dd mmm hh mm)	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°f)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°f)	(Air=1)	
31-Mar 05 15			445.5	59.4															
31-Mar 05 20			414.1	60.8															
31-Mar 05 25			382.9	61.9															
31-Mar 05 30			361.9	62.7															
31-Mar 05 35			346.1	63.4															
31-Mar 05 40			323.2	64.3															
31-Mar 05 45			313.1	64.9															
31-Mar 05 50			314.1	65.0															
31-Mar 05 55			140.2	64.9															WHP = 0 psi - no gas evident at flare
31-Mar 06 00			36.8	63.7															
31-Mar 06 01			22.9	63.5															
31-Mar 06 02			2.9	63.2															
31-Mar 06 03				62.9															
31-Mar 06 05				62.3															Pumped brine into tubing
31-Mar 06 07				61.8															
31-Mar 06 10				61.0															
31-Mar 06 15				59.8															
31-Mar 06 20				58.8															
31-Mar 06 25				57.9															

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

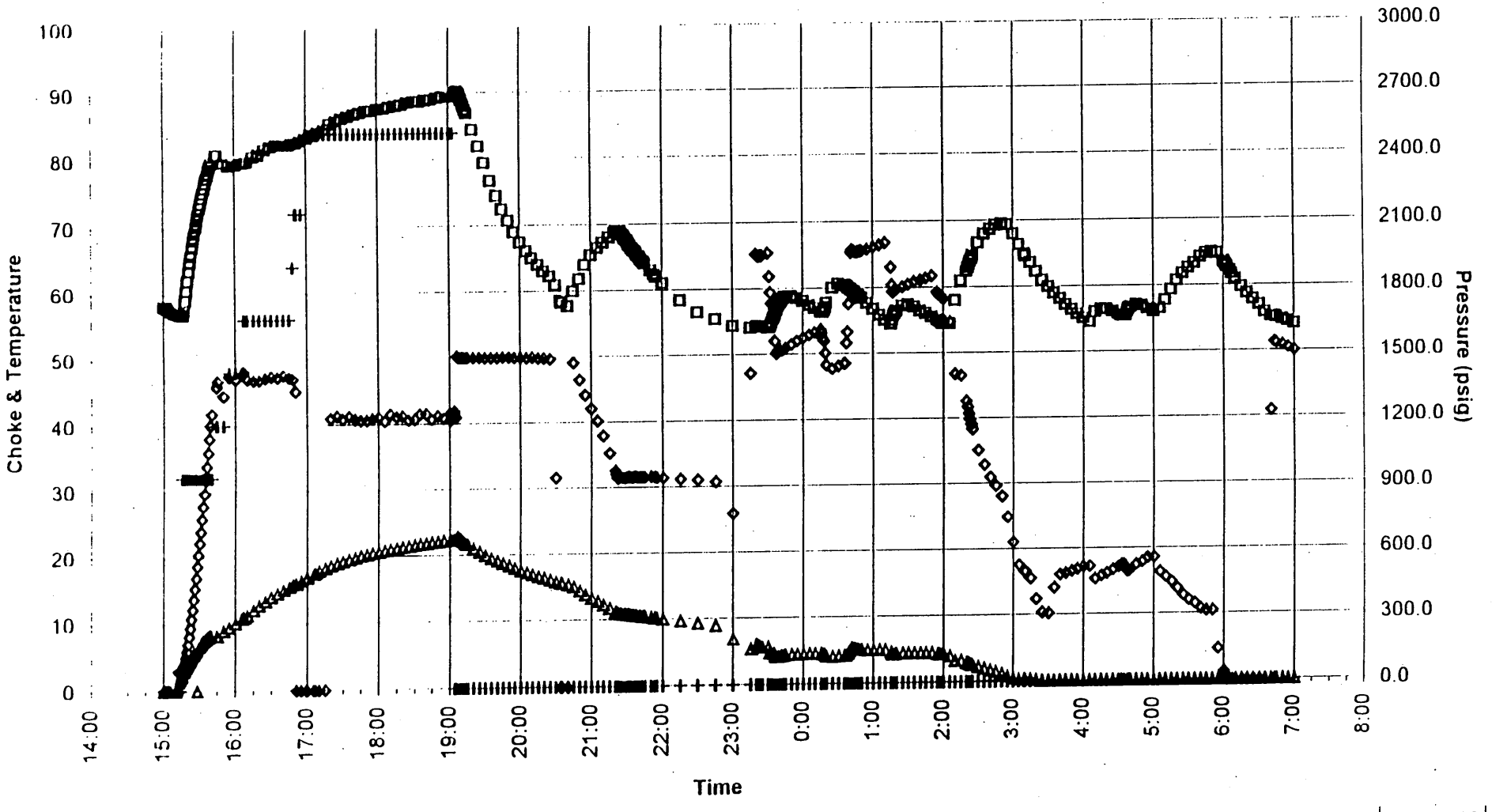
CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 31-Mar 07:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME (dd mmm hh:mm)	CHOKE SIZE (64ths)	CHOKE BS&W (%)	WHP (psig)	WHT (°F)	CSG (psig)	FLOW RATES GAS (MMscfd)	OIL (bpd)	WATER (bpd)	GOR mscf/bbl	SEPARATOR PRES. (psig)	TEMP. (°f)	BS&W (%)	WCT (%)	CUMMLATIVE GAS (MMscf)	OIL (bbls)	WATER (bbls)	SPECIFIC GRAVITY OIL (API@60°f)	GAS (Air=1)	REMARKS
31-Mar 06:30				57.0															
31-Mar 06:35				55.9															
31-Mar 06:40			1226.3	55.3															
31-Mar 06:43			1540.6	55.3															Total brine pumped into tubing = 193.4 bbls
31-Mar 06:45			1535.4	55.1															
31-Mar 06:50			1526.1	54.8															
31-Mar 06:54			1515.6	54.5															
31-Mar 07:00			1500.8	54.1															Commenced rigging down S.T.E/D.A.S equipment

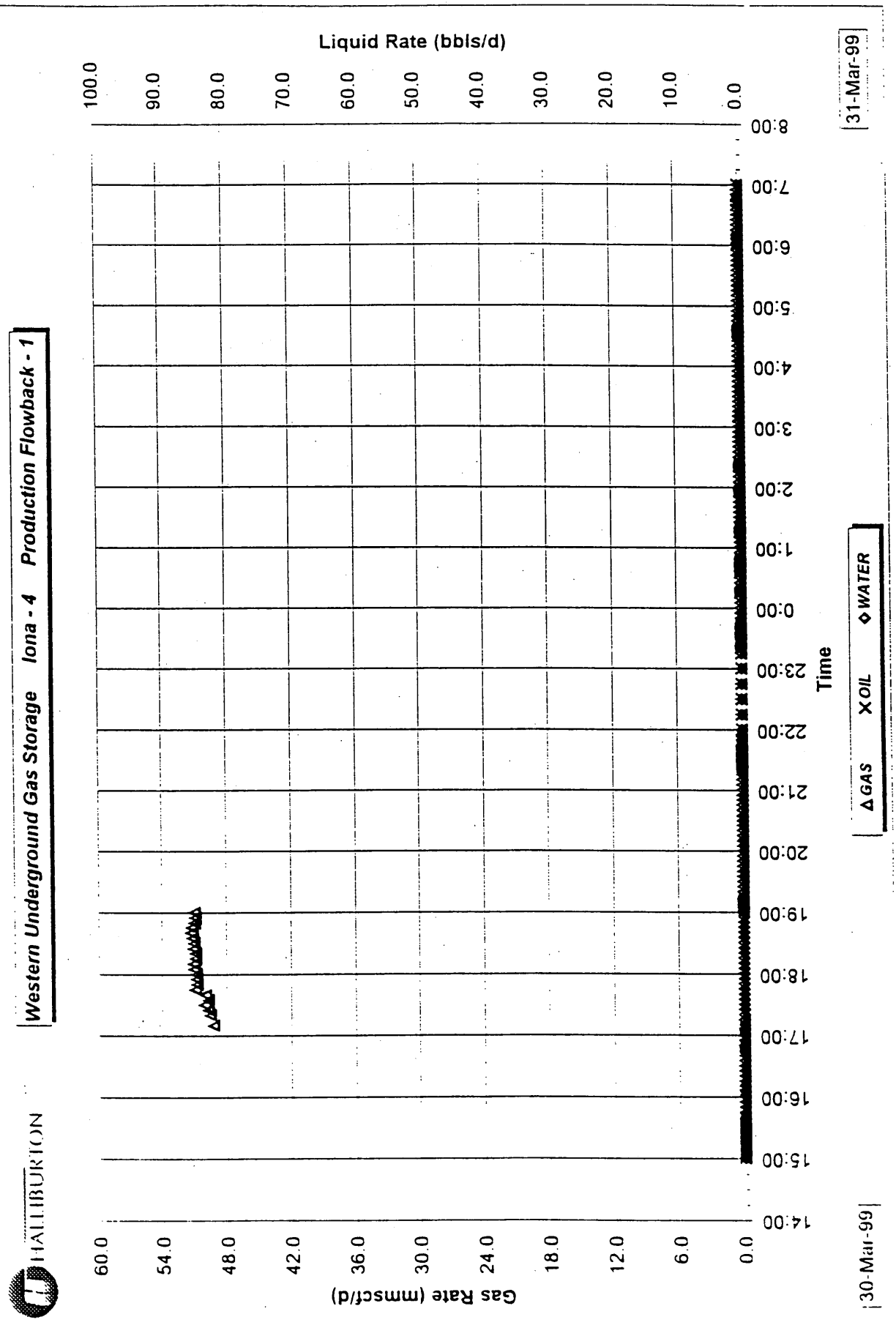
HALLIBURTON

Western Underground Gas Storage Iona - 4 Production Flowback - 1



Wellhead Plot

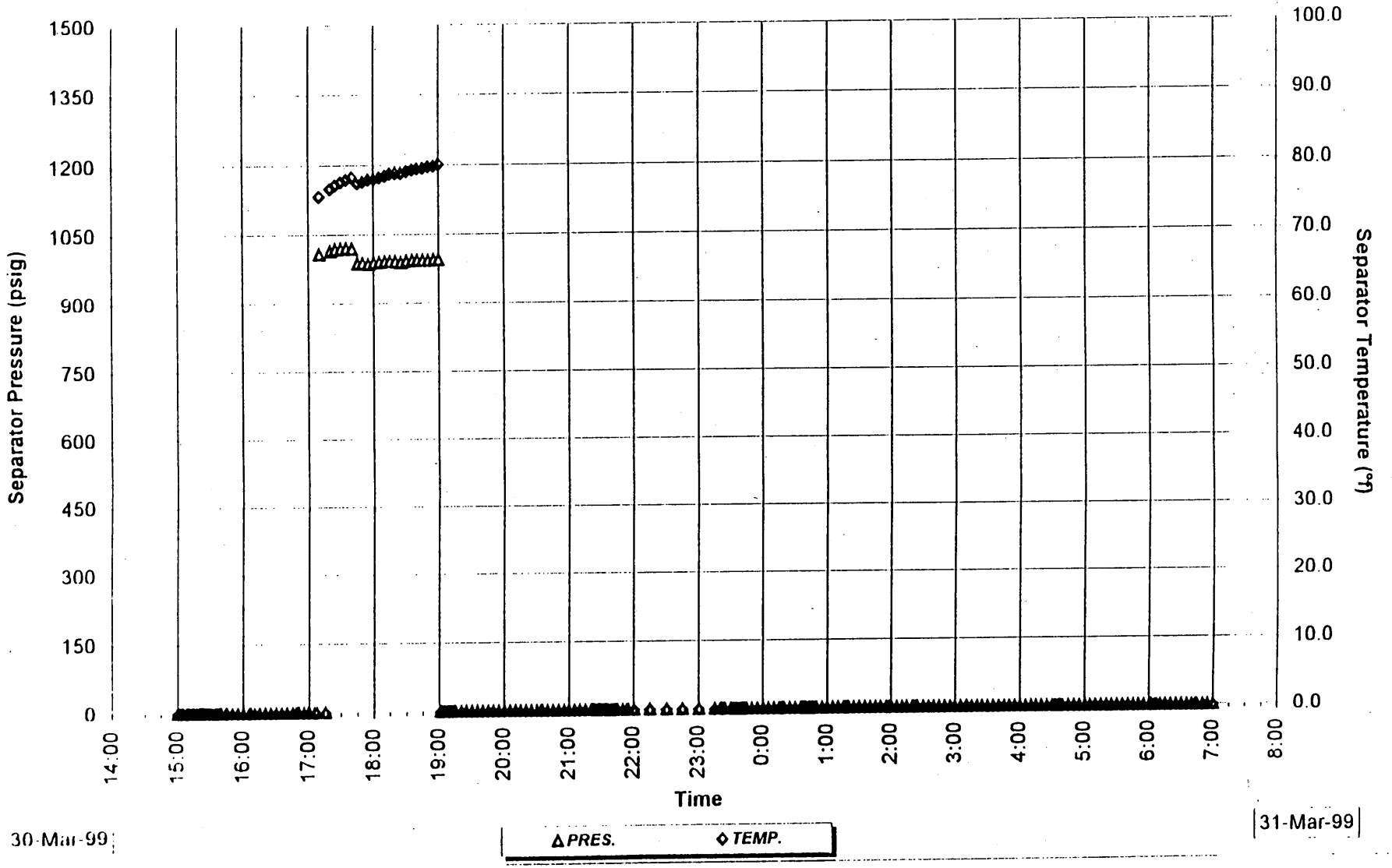
908910 032



Production Plot

HALLIBURTON

Western Underground Gas Storage Iona - 4 Production Flowback - 1



Separator Plot

908910 033

HALLIBURTON

GAS FLOW DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15:00 - 30-Mar 19:00
RIG : O.D.E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE	TIME	CHOKE SIZE	Pf	DIFF	GAS TEMP	ORIFICE SIZE	SQRT	Fb	Fpb	Ftb	Fg	Ftf	Fr	Y	Fpv	C'	GAS RATE (Q=C' * 24 * SQRT(Pf*Hw)	REMARKS
(dd/mm/yy)	(hr:mm)	(64ths)	(psia)	(in H2O)	(°F)	(inch)	(Pf * Hw)										(mmscf/d)	
30/03/99	17.00	84	1009		74				1.000	1.000	1.2220	0.9868		1.0000	1.0920			Stopped Methanol injection at choke manifold
30/03/99	17:05	84	1006		75				1.000	1.000	1.2220	0.9857		1.0006	1.0910			
30/03/99	17 10	84	1009	236	76	3.750	492.0	3172.09	1.000	1.000	1.2220	0.9853	1.0001	1.0011	1.0910	4171.60	49.260	
30/03/99	17 15	84	1011		76	3.750	277.5	3172.09	1.000	1.000	1.2220	0.9848	1.0002	1.0004	1.0880	4155.28		CO2 = 5.5% H2S = 0 ppm.
30/03/99	17.20	84	1018	239	77	3.750	496.6	3172.09	1.000	1.000	1.2220	0.9843	1.0001	1.0011	1.0880	4156.83	49.544	Pressure transducer changed out - WHP readings online again
30/03/99	17 25	84	1020	240	77	3.750	498.8	3172.09	1.000	1.000	1.2220	0.9839	1.0001	1.0011	1.0880	4154.32	49.727	
30/03/99	17 30	84	1021	244	78	3.750	502.6	3172.09	1.000	1.000	1.2220	0.9835	1.0001	1.0012	1.0880	4152.04	50.083	Gas gravity = 0.678
30/03/99	17 35	84	1020	243	78	3.750	501.4	3172.09	1.000	1.000	1.2140	0.9832	1.0001	1.0012	1.0900	4132.63	49.728	
30/03/99	17 40	84	1007	250	78	3.750	505.1	3172.09	1.000	1.000	1.2140	0.9828	1.0001	1.0012	1.0880	4126.03	50.022	
30/03/99	17.45	84	990	265	78	3.750	515.7	3172.09	1.000	1.000	1.2140	0.9836	1.0001	1.0013	1.0850	4116.28	50.948	CO2 = 7.0% H2S = 0 ppm
30/03/99	17 50	84	988	264	78	3.750	514.2	3172.09	1.000	1.000	1.2140	0.9834	1.0001	1.0013	1.0840	4114.33	50.773	BS&W not available - not enough fluid at choke
30/03/99	17 55	84	989	264	78	3.750	514.7	3172.09	1.000	1.000	1.2140	0.9832	1.0001	1.0013	1.0840	4112.85	50.802	
30/03/99	18 00	84	991	264	78	3.750	515.1	3172.09	1.000	1.000	1.2140	0.9830	1.0001	1.0013	1.0840	4112.47	50.836	Gas gravity = 0.678
30/03/99	18 05	84	993	265	78	3.750	517.0	3172.09	1.000	1.000	1.2140	0.9828	1.0001	1.0013	1.0840	4111.75	51.014	
30/03/99	18 10	84	994	266	79	3.750	517.5	3172.09	1.000	1.000	1.2140	0.9826	1.0001	1.0013	1.0840	4110.58	51.048	
30/03/99	18 15	84	993	264	79	3.750	516.1	3172.09	1.000	1.000	1.2140	0.9824	1.0001	1.0013	1.0840	4108.89	50.898	
30/03/99	18.20	84	994	264	79	3.750	516.1	3172.09	1.000	1.000	1.2140	0.9823	1.0001	1.0013	1.0840	4108.03	50.883	
30/03/99	18 25	84	994	266	79	3.750	517.8	3172.09	1.000	1.000	1.2140	0.9823	1.0001	1.0013	1.0840	4108.87	51.062	
30/03/99	18 30	84	995	265	79	3.750	517.6	3172.09	1.000	1.000	1.2140	0.9820	1.0001	1.0013	1.0840	4106.81	51.019	Commenced taking 1st H.P gas sample
30/03/99	18.35	84	996	267	79	3.750	519.1	3172.09	1.000	1.000	1.2140	0.9818	1.0001	1.0013	1.0840	4105.84	51.150	
30/03/99	18 40	84	996	268	80	3.750	520.8	3172.09	1.000	1.000	1.2140	0.9817	1.0001	1.0013	1.0840	4105.09	51.306	Finished taking 1st H.P gas sample

HALLIBURTON

GAS FLOW DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-Mar 15.00 - 30-Mar 19:00
RIG : O D E #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE (dd/mm/yy)	TIME (hh:mm)	CHOKE SIZE (64ths)	Pf (psig)	DIFF (mH2O)	GAS TEMP (f)	ORIFICE SIZE (inch)	SQRT (Pf * Hw)	Fb	Fpb	Ftb	Fg	Ftf	Fr	Y	Fpv	C'	GAS RATE (Q=C' * 24 * SQRT(Pf*Hw) (mmscf/d)	REMARKS
30/03/99	18.45	84	996	267	80	3.750	519.6	3172.09	1.000	1.000	1.2140	0.9816	1.0001	1.0013	1.0840	4104.39	51.186	Commenced taking 2nd H.P gas sample
30/03/99	18.50	84	997	265	80	3.750	517.5	3172.090	1.000	1.000	1.2140	0.9815	1.0001	1.0013	1.0840	4103.37	50.965	
30/03/99	18.55	84	997	264	80	3.750	517.0	3172.090	1.000	1.000	1.2140	0.9814	1.0001	1.0013	1.0840	4102.75	50.909	Finished taking 2nd H.P gas sample
30/03/99	19.00	84	38	10	80	3.750	23.1	3172.09	1.000	1.000	1.2140	0.9812	1.0027	1.0009	1.0030	3805.12	50.959	Lifted 3.750" orifice plate

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	REMARKS
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 15:15		32	66.2	89.9	56.9	0.3	55.3			1.1	128	Opened well to flare on 32/64" adj choke
30-Mar 15:16		32	84.6	96.8	56.8	2.0	55.3			0.8	128	
30-Mar 15:17		32	93.2	119.6	57.5	1.2	55.8			0.8	128	
30-Mar 15:18		32	104.3	147.2	59.0	1.7	56.9			1.8	128	
30-Mar 15:19		32	113.8	175.9	60.5	1.9	58.3			1.9	128	
30-Mar 15:20		32	123.2	208.5	62.1	1.9	59.8			2.0	128	Flowed brine to flare pit
30-Mar 15:21		32	132.0	243.6	63.5	2.1	61.5			2.1	128	
30-Mar 15:22		32	140.4	280.9	64.8	2.7	63.1			1.9	128	
30-Mar 15:23		32	149.5	323.7	65.9	2.3	64.7			2.2	128	
30-Mar 15:24		32	158.8	365.0	67.1	2.6	66.2			2.6	128	
30-Mar 15:25		32	165.1	409.7	68.2	2.7	67.6			2.5	128	
30-Mar 15:26		32	174.5	457.9	69.2	2.3	69.0			3.1	128	
30-Mar 15:27		32	183.0	507.7	70.2	2.9	70.2			2.7	128	
30-Mar 15:28		32		559.6	71.2	2.4	71.4			2.5	128	
30-Mar 15:29		32	196.8	614.0	72.1	3.4	72.4			2.8	128	
30-Mar 15:30		32	204.6	667.4	73.0	3.1	73.4			3.0	128	Gas to surface
30-Mar 15:31		32	211.5	718.2	73.7	3.0	74.4			3.2	128	

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	REMARKS
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 15:32		32	218.0	775.3	74.5	3.0	75.2			3.1	128	
30-Mar 15:33		32	223.1	832.4	75.2	3.2	76.1			3.4	128	
30-Mar 15:34		32	228.9	891.0	75.9	3.5	76.9			4.3	128	
30-Mar 15:35		32	233.7	950.0	76.6	4.1	77.6			3.1	128	
30-Mar 15:36		32	237.5	1015.2	77.3	4.3	78.3			3.8	128	
30-Mar 15:37		32	240.7	1076.0	77.9	4.2	79.0			3.3	128	
30-Mar 15:38		32	244.1	1140.6	78.6	8.0	79.7			7.9	128	
30-Mar 15:39		32	245.8	1201.2	79.2	31.0	80.4			29.7	128	
30-Mar 15:40		32	245.1	1252.1	79.7	46.2	80.9			43.5	128	
30-Mar 15:41		32	246.4	1299.4	80.1	53.4	81.3			49.7	128	
30-Mar 15:42		32	246.7	1341.8	80.5	55.5	81.6			51.8	128	
30-Mar 15:43		32	246.5	1376.5	80.7	66.1	81.7			63.1	128	
30-Mar 15:44		40	243.8	1374.8	80.9	188.0	81.5			181.0	128	Increased choke to 40/64"adj choke
30-Mar 15:45		40	244.1	1399.3	80.9	247.2	79.9			241.2	128	Last of brine to surface
30-Mar 15:46		40	244.8	1377.3	80.8	186.5	76.6			178.9	128	
30-Mar 15:47		40	249.4	1371.1	80.5	182.5	71.5			177.0	128	
30-Mar 15:48		40	253.5	1365.4	80.2	180.5	67.1			173.9	128	

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		REMARKS
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 15:49		40	259.7	1359.0	79.9	183.0	63.6			177.0	128	
30-Mar 15:50		40	266.6	1333.7	79.7	174.5	60.2			169.2	128	CO2 = 7% H2S = 0 ppm
30-Mar 15:51		40	270.4	1389.9	79.7	186.1	58.8			183.3	128	
30-Mar 15:52		40	274.6	1390.0	79.6	183.0	56.8			180.5	128	
30-Mar 15:53		40	278.5	1403.0	79.5	177.1	54.9			171.4	128	
30-Mar 15:54		40	280.7	1406.1	79.4	178.4	53.7			173.3	128	
30-Mar 15:55		48	284.5	1420.9	79.3	188.2	52.8			180.8	128	Increased choke to 48/64" adjustable
30-Mar 15:56		48	285.2	1398.9	79.3	271.8	52.3			262.6	128	
30-Mar 15:57		48	288.6	1398.5	79.3	276.3	51.6			266.2	128	
30-Mar 15:58		48	293.3	1411.7	79.4	282.8	51.1			273.7	128	
30-Mar 15:59		48	297.3	1409.3	79.4	278.0	50.5			272.6	128	
30-Mar 16:00	99.5	48	301.4	1407.8	79.5	277.7	49.6			269.8	128	BS&W = 99.5% H2O with 0.5% pipe dope/sediment
30-Mar 16:01		48	306.0	1417.2	79.5	277.8	48.7			270.0	128	
30-Mar 16:02		48	310.1	1419.4	79.5	278.8	48.1			269.3	128	
30-Mar 16:03		48	314.7	1419.6	79.6	281.4	47.5			273.6	128	
30-Mar 16:04		48	318.7	1420.5	79.7	283.7	46.8			275.9	128	
30-Mar 16:05		48	322.9	1433.1	79.7	264.2	46.0			257.2	128	

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	REMARKS
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 16:06		48	326.2	1437.3	79.7	263.4	45.3			255.4	128	
30-Mar 16:07		56	329.1	1444.1	79.8	259.9	44.7			252.7	128	Increased choke to 56/64" adjustable
30-Mar 16:08		56	332.2	1446.2	79.9	264.3	44.2			256.1	128	
30-Mar 16:09		56	333.2	1407.8	79.9	352.4	43.8			342.2	128	
30-Mar 16:10		56	337.1	1408.0	79.9	353.0	43.4			344.6	128	
30-Mar 16:11		56	341.5	1410.9	80.0	353.4	43.2			343.8	128	
30-Mar 16:12		56	345.9	1407.8	80.2	345.4	43.0			335.7	128	
30-Mar 16:13		56	349.8	1409.5	80.3	362.9	42.8			354.2	128	
30-Mar 16:14		56	354.0	1403.0	80.4	352.5	42.6			345.1	128	
30-Mar 16:15	82.0	56	359.0	1403.9	80.6	363.0	42.5			353.0	128	
30-Mar 16:16		56	363.0	1400.1	80.7	378.8	42.4			369.9	128	
30-Mar 16:17		56	367.9	1399.5	80.8	373.1	42.4			363.4	128	
30-Mar 16:18		56	372.5	1397.8	80.9	378.0	42.3			368.6	128	
30-Mar 16:19		56	376.4	1402.8	81.0	383.4	42.4			373.4	128	
30-Mar 16:20		56	380.4	1405.3	81.1	374.7	42.4			365.6	128	CO2 = 4%
30-Mar 16:21		56	384.8	1408.8	81.2	373.2	42.4			364.8	128	
30-Mar 16:22		56	387.6	1407.0	81.4	370.8	42.4			361.2	128	

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HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		REMARKS
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	
dd-mmm hh:mm	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 16:23		56	392.1	1411.1	81.4	371.2	42.4			361.3	128	
30-Mar 16:24		56	396.3	1411.8	81.6	375.2	42.3			366.0	128	
30-Mar 16:25	76.0	56	398.9	1414.0	81.7	371.9	42.2			363.0	128	BS&W = 75% H2O and 1% sediment
30-Mar 16:26		56	403.4	1414.5	81.8	373.3	42.2			363.7	128	
30-Mar 16:27		56	407.0	1416.9	81.9	373.6	42.1			365.0	128	
30-Mar 16:28		56	411.2	1418.0	82.0	373.8	42.0			365.7	128	
30-Mar 16:29		56	414.7	1420.5	82.1	375.6	41.9			366.0	128	
30-Mar 16:30		56	417.8	1421.1	82.2	377.1	41.9			367.5	128	Diverted flow through separator
30-Mar 16:31		56	422.2	1420.9	82.3	403.4	41.7			353.2	128	
30-Mar 16:32		56	424.8	1421.1	82.3	416.4	41.7			360.6	128	
30-Mar 16:33		56	427.9	1427.3	82.4	446.0	41.6			355.7	128	
30-Mar 16:34		56	431.6	1422.5	82.4	660.5	41.8			197.6	128	
30-Mar 16:35		56	434.2	1416.3	82.5	873.7	42.3			240.6	128	Separator block valve worked closed -
30-Mar 16:36		56	436.2	1417.2	82.5	1153.5	43.7			214.3	128	diverted flow out of and back into separator
30-Mar 16:37		56	440.2	1421.3	82.5	479.9	46.2			473.4	128	
30-Mar 16:38		56	443.5	1420.9	82.5	420.0	46.8			364.9	128	
30-Mar 16:39		56	446.8	1422.8	82.5	553.8	46.8			232.4	128	

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	REMARKS
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 16:40		56	449.3	1424.0	82.4	754.8	47.2			219.6	128	
30-Mar 16:41		56	452.3	1423.0	82.4	931.5	48.2			329.9	128	
30-Mar 16:42		56	455.7	1423.4	82.4	968.3	49.6	966.5	63.3	405.1	128	
30-Mar 16:43		56	459.0	1420.1	82.4	972.8	51.3	968.9	64.7	375.3	128	
30-Mar 16:44		56	461.3	1418.4	82.4	966.0	53.0	963.7	64.7	366.1	128	
30-Mar 16:45		56	464.4	1415.3	82.4	987.6	54.7	984.9	64.8	353.1	128	
30-Mar 16:46		56	467.0	1418.2	82.5	971.7	56.2	967.9	65.3	380.8	128	
30-Mar 16:47		56	469.8	1417.4	82.5	983.9	57.5	981.3	65.5	359.7	128	
30-Mar 16:48		64	473.9	1407.8	82.6	989.3	58.8	986.0	65.8	396.5	128	Increased choke to 64/64" adjustable
30-Mar 16:49		64	473.4	1368.4	82.6	986.2	59.9	982.4	66.5	461.6	128	
30-Mar 16:50		72	476.6	1352.0	82.7	1001.0	61.1	995.5	67.4	460.6	128	Increased choke to 72/64" adjustable
30-Mar 16:51		72	476.9		82.7	1001.9	62.1	995.4	68.6	562.3	128	Suspect WHP transducer - changed out - readings n/a
30-Mar 16:52		72	480.2		82.7	990.1	63.3	983.9	69.3	549.8	128	
30-Mar 16:53		72	484.7		82.7	1001.6	64.3	995.9	70.7	547.8	128	
30-Mar 16:54		72	488.4		82.9	988.1	65.3	984.0	70.6	536.9	128	
30-Mar 16:55		72	491.2		83.0	994.7	66.2		71.4	535.8	128	
30-Mar 16:56		72	496.4		83.1	993.7	67.1		71.7	537.4	128	

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	REMARKS
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 16:57		72	500.0		83.2	1004.1	67.8		72.5	521.2	128	
30-Mar 16:58		72	503.7		83.4	995.8	68.7	990.2	72.1	533.3	128	
30-Mar 16:59		84	503.5		83.4	1008.6	69.3	1002.4	73.1	627.7	128	Increased choke to 84/64" adjustable
30-Mar 17:00		84	505.7		83.4	1011.3	70.1	1003.0	74.0	633.3	128	Stopped Methanol injection at choke manifold
30-Mar 17:01		84	509.7		83.4	1016.7	70.8	1010.1	74.7	634.4	128	
30-Mar 17:02		84	512.3		83.5	1020.1	71.6	1013.7	75.1	637.4	128	
30-Mar 17:03		84	515.3		83.6	1020.8	72.2	1015.7	75.4	647.3	128	
30-Mar 17:04		84	517.6		83.7	1010.8	72.8	1001.9	74.9	645.5	128	
30-Mar 17:05		84	520.1		83.8	1010.8	73.2	1004.8	75.2	660.0	128	
30-Mar 17:06		84	523.1		83.9	1014.8	73.7	1006.6	75.4	656.2	128	
30-Mar 17:07		84	526.5		84.0	1017.7	74.1	1008.2	75.6	652.5	128	Installed 3.750" orifice plate
30-Mar 17:08		84	529.5		84.1	1021.6	74.5	1004.8	75.4	652.5	128	
30-Mar 17:09		84	531.5		84.2	1021.5	74.7	1007.0	75.5	656.0	128	
30-Mar 17:10		84	534.3		84.3	1026.8	75.1	1009.4	75.6	659.4	128	
30-Mar 17:11		84	536.8		84.4	1026.8	75.3	1009.1	75.7	658.0	128	
30-Mar 17:12		84	539.1		84.5	1023.5	75.5	1009.4	75.8	655.4	128	
30-Mar 17:13		84	541.3		84.6	1024.3	75.8	1010.1	75.9	661.3	128	

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	REMARKS
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 17 14		84	543 6		84.8	1026.3	76.0	1008.3	76.0	664.4	128	
30-Mar 17 15		84	545.9		84.7	1025.9	76.2	1008.1	76.1	654.3	128	CO2 = 5.5% H2S = 0 ppm.
30-Mar 17 16		84	547.9		84.9	1024.2	76.4	1008.7	76.3	660.0	128	
30-Mar 17 17		84	550 1		85.1	1030.7	76.6	1010.5	76.4	658.6	128	
30-Mar 17 18		84	552.0		85.2	1028.4	76.7	1013.1	76.5	663.7	128	
30-Mar 17 19		84	555 2		85.4	1031.9	76.9	1015.8	76.6	663.2	128	
30-Mar 17 20		84	557 1	1229.9	85.5	1031.0	77.0	1016.7	76.7	655.8	128	Pressure xdcr changed out - WHP readings online
30-Mar 17 21		84	558.8	1222.9	85.7	1034.5	77.1	1017.2	76.8	663.4	128	
30 Mar 17 22		84	560 6	1230.9	85.7	1030.8	77.2	1018.2	76.9	665.3	128	
30-Mar 17 23		84	563 2	1219.8	85.8	1033.2	77.3	1018.6	76.9	666.0	128	
30-Mar 17 24		84	565 4	1223.0	85.9	1035.4	77.4	1018.6	77.1	665.3	128	
30-Mar 17 25		84	567.1	1237.5	85.9	1034.1	77.5	1019.6	77.2	672.7	128	
30 Mar 17 26		84	569 2	1223.2	86.0	1036.9	77.6	1019.4	77.3	667.4	128	
30-Mar 17 27		84	571 2	1232.4	86.1	1038.5	77.7	1020.4	77.4	664.8	128	
30-Mar 17 28		84	573 0	1220.2	86.2	1037.6	77.7	1020.6	77.4	666.0	128	
30-Mar 17 29		84	574 7	1233 9	86.3	1035.2	77.9	1020.8	77.5	667.1	128	
30 Mar 17 30		84	577 3	1225.7	86.3	1040.4	77.9	1021.2	77.6	668.0	128	Gas gravity = 0.678

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		REMARKS
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 17:31		84	576.8	1219.6	86.3	1037.0	78.0	1020.4	77.7	662.0	128	
30-Mar 17:32		84	580.0	1224.0	86.4	1035.4	78.1	1020.8	77.8	668.2	128	
30-Mar 17:33		84	582.0	1223.8	86.5	1038.3	78.1	1021.3	77.8	677.4	128	
30-Mar 17:34		84	583.6	1241.5	86.5	1039.0	78.2	1022.5	77.9	673.6	128	
30-Mar 17:35		84	585.7	1235.4	86.6	1037.8	78.2	1021.8	78.0	666.6	128	
30-Mar 17:36		84	587.8	1217.5	86.7	1038.8	78.3	1021.0	78.0	662.4	128	
30-Mar 17:37		84	588.5	1228.4	86.7	1035.6	78.4	1019.8	78.1	671.4	128	
30-Mar 17:38		84	590.0	1221.0	86.8	1038.0	78.4	1020.0	78.2	664.3	128	
30-Mar 17:39		84	591.8	1224.6	86.8	1038.4	78.4	1019.9	78.3	675.3	128	
30-Mar 17:40		84	593.1	1225.5	86.9	1035.8	78.5	1020.8	78.3	667.5	128	
30-Mar 17:41		84	595.1	1232.8	87.0	1038.8	78.7	1022.0	78.4	674.7	128	
30-Mar 17:42		84	596.6	1233.7	87.1	1040.9	78.7	1022.4	78.4	670.3	128	
30-Mar 17:43		84	597.8	1230.1	87.1	1001.3	78.8	983.6	77.1	684.3	128	
30-Mar 17:44		84	599.2	1219.4	87.1	1003.5	78.7	988.2	77.5	681.9	128	
30-Mar 17:45		84	600.8	1219.2	87.2	1006.7	78.7	989.1	77.5	685.2	128	CO2 = 7.0% H2S = 0 ppm
30-Mar 17:46		84	601.2	1229.9	87.2	1005.2	78.6	989.8	77.5	690.0	128	
30-Mar 17:47		84	603.1	1230.9	87.3	1011.8	78.6	990.9	77.6	686.5	128	

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME (dd mmm hh:mm)	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		REMARKS
	BS&W (%)	Choke Size (64ths)	Annulus Pressure (psig)	Upstream Choke Pressure (psig)	Upstream Choke Temperature (°F)	Downstream Choke Pressure (psig)	Downstream Choke Temperature (°F)	Separator Pressure (psig)	Separator Temp (°F)	Gas Flare Line Pressure (psig)	Flare Line Choke Size (64ths)	
30-Mar 17:48		84	605.1	1234.3	87.3	1008.7	78.6	991.6	77.6	684.2	128	
30-Mar 17:49		84	605.9	1229.0	87.3	1010.1	78.6	990.5	77.7	680.3	128	
30-Mar 17:50		84	607.5	1218.9	87.4	1006.4	78.5	990.6	77.7	689.1	128	BS&W not available - not enough fluid at choke
30-Mar 17:51		84	608.3	1228.0	87.4	1006.1	78.5	988.9	77.7	685.3	128	
30-Mar 17:52		84	609.4	1222.9	87.4	1006.0	78.6	987.3	77.7	684.8	128	
30-Mar 17:53		84	610.7	1223.4	87.4	1005.4	78.6	987.2	77.8	676.3	128	
30-Mar 17:54		84	611.5	1213.9	87.4	1007.2	78.6	987.6	77.9	686.3	128	
30-Mar 17:55		84	613.0	1225.7	87.5	1005.9	78.6	988.0	78.0	684.2	128	
30-Mar 17:56		84	614.8	1233.1	87.5	1008.7	78.6	988.6	77.9	678.8	128	
30-Mar 17:57		84	615.3	1227.4	87.5	1008.3	78.7	988.7	78.0	684.0	128	
30-Mar 17:58		84	616.5	1228.4	87.6	1011.3	78.7	990.1	78.0	689.4	128	
30-Mar 17:59		84	617.2	1225.1	87.6	1011.3	78.8	990.6	78.1	683.4	128	
30-Mar 18:00		84	618.0	1230.7	87.7	1010.8	78.8	990.8	78.1	687.8	128	Gas gravity = 0.678
30-Mar 18:01		84	620.3	1227.8	87.7	1010.0	78.8	990.2	78.2	689.4	128	
30-Mar 18:02		84	621.1	1232.6	87.7	1008.3	78.8	992.0	78.3	686.2	128	
30-Mar 18:03		84	621.8	1225.7	87.7	1010.4	78.9	991.4	78.2	685.8	128	
30-Mar 18:04		84	623.2	1228.4	87.7	1007.8	78.9	991.7	78.2	693.9	128	

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		REMARKS
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 18:05		84	624.9	1214.7	87.8	1009.5	78.9	992.5	78.3	685.4	128	
30-Mar 18:06		84	625.3	1237.1	87.9	1010.4	79.0	992.4	78.4	690.6	128	
30-Mar 18:07		84	626.3	1218.5	87.9	1008.4	79.0	993.0	78.4	690.1	128	
30-Mar 18:08		84	628.2	1223.8	88.0	1011.6	79.0	993.3	78.5	686.2	128	
30-Mar 18:09		84	628.9	1222.7	88.0	1010.8	79.0	993.9	78.4	688.6	128	
30-Mar 18:10		84	629.6	1245.0	88.0	1010.6	79.1	993.3	78.5	686.1	128	
30-Mar 18:11		84	630.8	1249.5	88.1	1013.5	79.1	993.6	78.6	686.7	128	
30-Mar 18:12		84	631.5	1236.6	88.1	1011.5	79.1	993.9	78.6	684.4	128	
30-Mar 18:13		84	632.2	1223.8	88.1	1012.1	79.1	993.1	78.6	686.1	128	
30-Mar 18:14		84	634.0	1215.4	88.1	1011.3	79.2	994.2	78.7	688.5	128	
30-Mar 18:15		84	634.7	1233.3	88.2	1011.1	79.2	993.3	78.8	683.2	128	
30-Mar 18:16		84	634.9	1228.8	88.2	1014.1	79.2	993.3	78.8	691.0	128	
30-Mar 18:17		84	636.5	1241.0	88.2	1011.7	79.2	993.5	78.8	685.4	128	
30-Mar 18:18		84	637.2	1233.1	88.2	1008.6	79.2	992.4	78.9	686.3	128	
30-Mar 18:19		84	637.9	1252.2	88.2	1014.2	79.2	992.5	78.9	689.1	128	
30-Mar 18:20		84	638.3	1236.2	88.3	1014.7	79.3	993.4	78.9	682.3	128	
30-Mar 18:21		84	639.8	1223.0	88.3	1011.3	79.3	993.3	79.0	689.7	128	

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		REMARKS
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 18:22		84	640.7	1220.2	88.4	1013.4	79.3	993.6	79.0	686.6	128	
30-Mar 18:23		84	641.8	1208.0	88.5	1010.1	79.4	993.7	79.1	686.2	128	
30-Mar 18:24		84	642.5	1233.3	88.5	1011.1	79.5	993.7	79.0	689.3	128	
30-Mar 18:25		84	642.9	1220.8	88.6	1009.3	79.5	991.8	78.9	691.1	128	
30-Mar 18:26		84	643.2	1242.3	88.6	1013.0	79.4	995.2	79.1	697.4	128	
30-Mar 18:27		84	644.9	1229.9	88.6	1017.4	79.5	994.0	79.1	693.1	128	
30-Mar 18:28		84	645.1	1217.0	88.7	1013.2	79.4	995.1	79.3	692.7	128	
30-Mar 18:29		84	646.4	1231.4	88.7	1014.1	79.4	995.6	79.2	688.7	128	
30-Mar 18:30		84	647.7	1222.9	88.8	1010.4	79.4	994.9	79.2	684.6	128	Commenced taking 1st H.P gas sample
30-Mar 18:31		84	647.9	1245.7	88.8	1014.1	79.4	994.9	79.3	693.2	128	
30-Mar 18:32		84	648.7	1234.3	88.7	1011.4	79.5	994.9	79.3	688.8	128	
30-Mar 18:33		84	649.6	1235.8	88.8	1013.3	79.5	995.5	79.4	693.3	128	
30-Mar 18:34		84	649.5	1227.4	88.8	1011.3	79.5	995.6	79.4	685.4	128	
30-Mar 18:35		84	652.1	1244.8	88.8	1012.8	79.5	995.5	79.4	689.7	128	
30-Mar 18:36		84	651.6	1244.6	88.9	1013.3	79.6	995.4	79.5	686.7	128	
30-Mar 18:37		84	652.9	1242.7	88.9	1017.6	79.6	995.9	79.5	686.7	128	
30-Mar 18:38		84	653.1	1223.4	88.9	1016.5	79.6	996.2	79.5	686.6	128	

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	REMARKS
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 18:39		84	654.0	1225.0	88.9	1012.6	79.6	995.7	79.5	687.4	128	
30-Mar 18:40		84	654.6	1245.3	88.9	1018.1	79.6	996.1	79.5	692.5	128	Finished taking 1st H.P gas sample
30-Mar 18:41		84	655.2	1229.5	89.0	1017.5	79.6	995.9	79.6	691.2	128	
30-Mar 18:42		84	656.1	1235.6	89.0	1013.1	79.7	996.5	79.6	695.1	128	
30-Mar 18:43		84	657.2	1234.1	89.0	1016.3	79.7	996.0	79.7	691.8	128	
30-Mar 18:44		84	658.0	1215.8	89.1	1017.1	79.7	995.7	79.7	685.9	128	
30-Mar 18:45		84	659.6	1223.2	89.1	1012.2	79.7	996.0	79.6	687.6	128	Commenced taking 2nd H.P gas sample
30-Mar 18:46		84	658.9	1222.3	89.1	1012.3	79.7	995.1	79.7	696.0	128	
30-Mar 18:47		84	660.1	1221.0	89.1	1013.7	79.7	995.8	79.7	691.9	128	
30-Mar 18:48		84	660.4	1220.2	89.2	1016.7	79.7	997.0	79.8	686.2	128	
30-Mar 18:49		84	660.7	1226.5	89.3	1015.7	79.8	996.1	79.8	693.1	128	
30-Mar 18:50		84	662.0	1235.6	89.3	1016.3	79.7	996.1	79.8	687.4	128	
30-Mar 18:51		84	663.3	1214.7	89.3	1013.2	79.7	996.2	79.9	691.8	128	
30-Mar 18:52		84	662.8	1236.8	89.3	1015.0	79.7	996.5	79.9	688.8	128	
30-Mar 18:53		84	664.3	1221.9	89.4	1013.4	79.8	997.1	80.0	689.4	128	
30-Mar 18:54		84	664.6	1234.3	89.4	1014.9	79.8	997.0	79.9	690.6	128	
30-Mar 18:55		84	665.7	1225.9	89.5	1016.6	80.0	996.9	79.9	685.5	128	Finished taking 2nd H.P gas sample

HALLIBURTON

WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		REMARKS
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 18 56		84	666.3	1241.7	89.5	1014.1	80.0	996.9	80.0	685.0	128	
30-Mar 18 57		84	666 7	1224.0	89.5	1014.2	80.0	996.5	80.0	694.7	128	
30-Mar 18 58		84	667.0	1238.3	89.5	1011.6	80.0	997.0	80.0	687.0	128	
30-Mar 18 59		84	667 0	1214.3	89.5	1012.8	80.1	995.9	80.0	684.7	128	
30-Mar 19 00		84	668.0	1248.4	89.5	1017.0	80.1	996.3	80.1	680.6	128	Lifted 3.750" orifice plate
30-Mar 19 01		84	669.1	1217.7	89.5	1013.6				691.7	128	
30-Mar 19 02		84	669.2	1225.1	89.5	1014.8				687.3	128	
30-Mar 19 03		84	669.5	1244.6	89.5	1015.5				692.7	128	
30-Mar 19 04			670.0	1257.7	89.5	1013.2				686.1		Closed well in at choke manifold
30-Mar 19 05			671.4	1230.1	89.5	1014.0						
30-Mar 19 06			682.2	1508.6	90.1							
30-Mar 19 07			679 8	1501.3	90.3							
30-Mar 19 08			676 3	1501.9	90.1							
30-Mar 19 09			673.0	1502.3	89.8							
30-Mar 19 10			668 0	1502.1	89.3							
30 Mar 19 11			663 7	1502.3	88.9							
30 Mar 19 12			660 2	1500.6	88.4							

HALLIBURTON

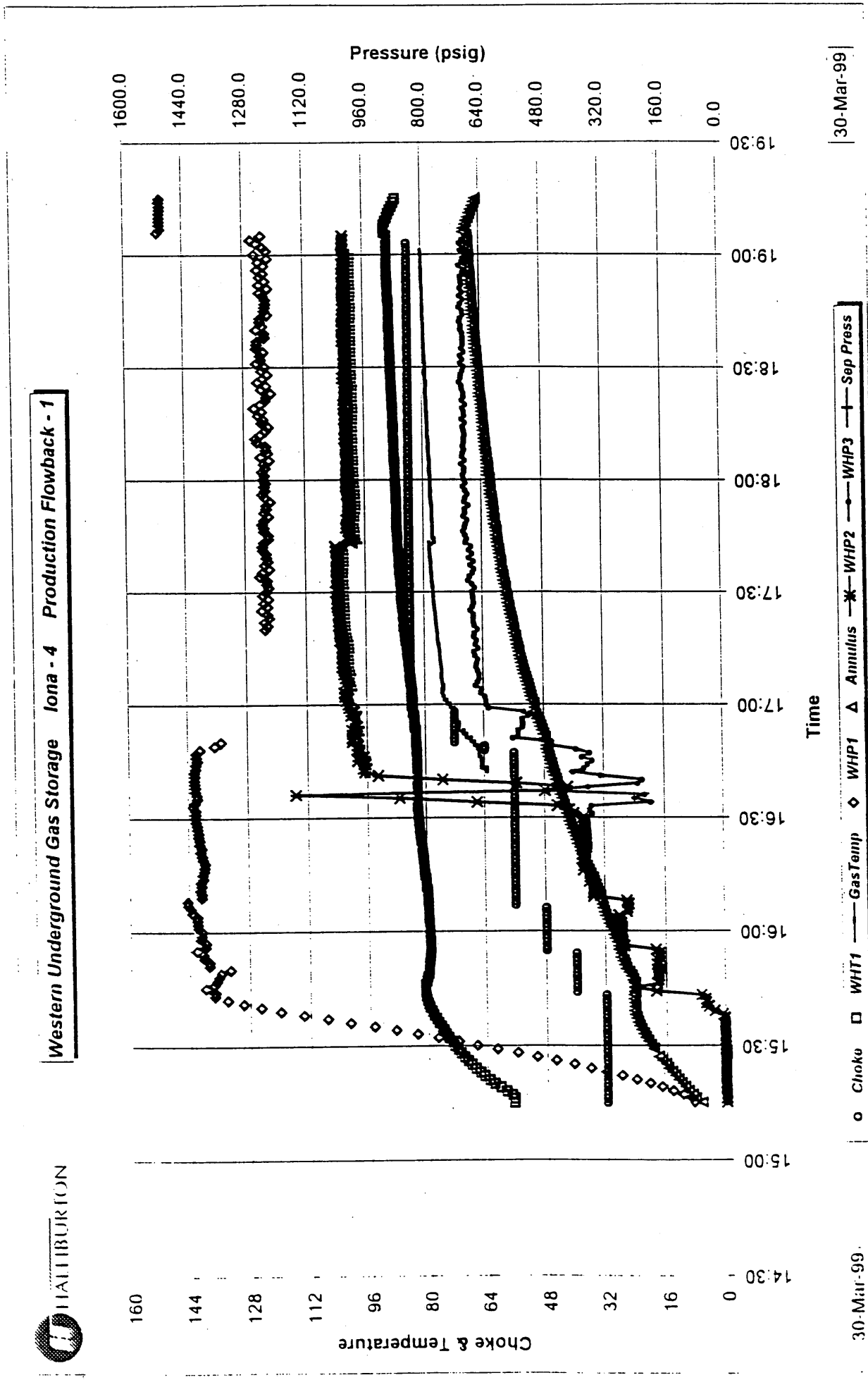
WELL TEST PRESSURE SUMMARY SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 30-March 15:00 - 30-March 19:15
RIG : ODE #30

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Production Flowback - 1
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	WELLHEAD			UPSTREAM		DOWNSTREAM		SEPARATOR		DOWNSTREAM GAS FLARE LINE		REMARKS
	BS&W	Choke Size	Annulus Pressure	Upstream Choke Pressure	Upstream Choke Temperature	Downstream Choke Pressure	Downstream Choke Temperature	Separator Pressure	Separator Temp	Gas Flare Line Pressure	Flare Line Choke Size	
(dd-mmm hh:mm)	(%)	(64ths)	(psig)	(psig)	(°F)	(psig)	(°F)	(psig)	(°F)	(psig)	(64ths)	
30-Mar 19:13			655.6	1501.1	88.0							
30-Mar 19:14			651.4	1501.7	87.5							
30-Mar 19:15			648.1	1500.8	87.0							


Western Underground Gas Storage Iona - 4 Production Flowback - 1
Pressure (psig)
1600.0
1440.0
1280.0
1120.0
960.0
800.0
640.0
480.0
320.0
160.0
0.0
Choke & Temperature
160
144
128
112
96
80
64
48
32
16
0
14:30
15:00
15:30
16:00
16:30
17:00
17:30
18:00
18:30
19:00
19:30
Time
30-Mar-99
30-Mar-99
Choke
WHT1
GasTemp
WHP1
Annulus
WHP2
WHP3
Sep Press
Wellhead Plot

HALLIBURTON ENERGY SERVICES

PRODUCTION TEST DETAIL REPORT
SEQUENCE OF OPERATIONS

CUSTOMER : Western Underground Gas Storage
TEST No. : Production Flowback - 1
WELL : Iona - 4
RIG NAME : O.D.E #30

DATE	TIME	OPERATIONS
22-Mar-99	19:00	D.Richards arrived on location
23-Mar-99	19:00	G.Giancaspro, M.Hodge, P.Brown, R.McPherson and S. Marcuccio
23-Mar-99	19:00	arrived on location
24-Mar-99	6:00	Crew attended Safety Induction meeting
24-Mar-99	7:30	Inspected Iona #1 to fit production spool piece
24-Mar-99	8:00	Crane required to lift spool piece into place
24-Mar-99	11:00	Calibrated wellhead chart recorders
24-Mar-99	13:00	Crane not available to position Surface Test Equipment (S.T.E) and
24-Mar-99	13:00	Data Acquisition Services lab (D.A.S)
24-Mar-99	13:30	Returned to camp and checked out D.A.S computer systems
24-Mar-99	18:00	Secured S.T.E over night
25-Mar-99	7:00	On location - waited on crane to arrive
25-Mar-99	7:30	Crane arrived - went to Iona #1 to commence fitting spool piece
25-Mar-99	8:00	Unable to fit spool piece - returned to Iona #4
25-Mar-99	8:00	R.Viner arranged for modifications to spool piece
25-Mar-99	8:00	Commenced spotting D.A.S/S.T.E on lease
25-Mar-99	11:00	Finished moving and spotting equipment
25-Mar-99	13:00	Returned to Iona #1 and continued fitting spool piece
25-Mar-99	13:00	Commenced laying out S.T.E pipe work
25-Mar-99	15:00	Fitted separator relief line and arranged with rig welder to make brackets to
25-Mar-99	15:00	fix in place
25-Mar-99	17:00	Power connected to D.A.S lab - OK
25-Mar-99	19:00	Continued making up surface lines to flare pit
25-Mar-99	20:00	Made up 3 joints of 9 5/8" casing for end of flare line
25-Mar-99	22:30	Secured equipment overnight
25-Mar-99	22:00	Connected up all temperature transducers and monitored overnight
26-Mar-99	7:00	Arrived on location - continued rigging in S.T.E and other associated equipment
26-Mar-99	0:08	Checked temperature transducers for linearity - OK
26-Mar-99	9:00	Removed and checked oil and H2O strainers - OK
26-Mar-99	10:00	Rigged in Emergency Shutdown System lines
26-Mar-99	11:00	Rigged in chemical injection pumps

HALLIBURTON ENERGY SERVICES

PRODUCTION TEST DETAIL REPORT
SEQUENCE OF OPERATIONS

CUSTOMER : Western Underground Gas Storage
TEST No. : Production Flowback - 1
WELL : Iona - 4
RIG NAME : O.D.E #30

DATE	TIME	OPERATIONS
26-Mar-99	13:00	Rigged in SCAN wiring to pressure and temperature transducers
26-Mar-99	17:00	Welder fitted and secured separator relief line bracket
27-Mar-99	7:00	Arrived on location
27-Mar-99	7:30	Rigged in adjustable choke to gas flare line
27-Mar-99	8:30	Checked calibration of differential transmitter to 400" - OK
27-Mar-99	10:00	Continued checking S.T.E lines and associated equipment
27-Mar-99	10:00	Made up ignition pilot for gas flare
27-Mar-99	11:00	Rigged in propane lines & ignition system to flare
27-Mar-99	12:00	Flushed separator oil and H2O lines
27-Mar-99	13:00	Refitted strainer covers to oil and water lines
27-Mar-99	23:30	Rigged up wireline equipment onto wellhead
28-Mar-99	0:00	Commenced pressure testing Halliburton surface lines
28-Mar-99	1:30	Made up wireline toolstring into lubricator
28-Mar-99	2:15	Lifted lubricator onto wellhead
28-Mar-99	2:40	R.I.H with 3.813" GS pulling tool
28-Mar-99	3:20	Latched and pulled XXN lock mandrel at 1425 metres KB
28-Mar-99	3:15	P.O.O.H
28-Mar-99	3:30	Prepared to pressure test permanent packer
28-Mar-99	5:15	R.I.H with 4.562" BO shifting tool to open S.S.D
28-Mar-99	5:25	Latched into S.S.D at 1412 metres KB
28-Mar-99	5:15	Jarred down to open S.S.D - unable to move S.S.D
28-Mar-99	5:30	Applied 100 psi to tubing - jarred through S.S.D
28-Mar-99	5:30	Some returns to trip tank
28-Mar-99	5:30	Remained on bottom - rig prepared to circulate N2 down tubing
28-Mar-99	10:45	P.O.O.H
28-Mar-99	11:00	At surface - removed BO shifting tool - re-pinned tool
28-Mar-99	11:00	Fluid tagged at 430 metres KB
28-Mar-99	11:05	Bled off lubricator and lay out tools
28-Mar-99	11:25	Made up lubricator and R.I.H to confirm S.S.D shut
28-Mar-99	12:10	Pressure tested annulus to check S.S.D shut - No good
28-Mar-99	12:27	R.I.H to shut S.S.D and check position

HALLIBURTON ENERGY SERVICES

PRODUCTION TEST DETAIL REPORT
SEQUENCE OF OPERATIONS

CUSTOMER : Western Underground Gas Storage
TEST No. : Production Flowback - 1
WELL : Iona - 4
RIG NAME : O.D.E #30

DATE	TIME	OPERATIONS
28-Mar-99	12:45	P.O.O.H
28-Mar-99	13:00	O.O.H - fluid tagged at 370m - heavy fluid
28-Mar-99	13:08	Bled off lubricator - laid out tools and performed checks on same
28-Mar-99	13:25	Opened master valve and pressure tested annulus to 1000 psi
28-Mar-99	13:40	Picked up wireline into lubricator with BO shifting tool
28-Mar-99	13:45	Pressured up lubricator
28-Mar-99	13:50	R.I.H with BO shifting tool
28-Mar-99	14:50	P.O.O.H
28-Mar-99	15:20	O.O.H - Closed lower master valve and bled pressure to 0 psi through choke
28-Mar-99	15:25	Unstabbed lubricator - changed out wireline tool - 4.1" L.I.B
28-Mar-99	15:37	Tagged fluid at 366m
28-Mar-99	15:56	P.O.O.H with L.I.B
28-Mar-99	16:15	O.O.H - toolstring in lubricator - bled off
28-Mar-99	16:17	No tell-tale markings on L.I.B
28-Mar-99	16:30	R.I.H with shifting tool
28-Mar-99	17:11	P.O.O.H with shifting tool
28-Mar-99	18:44	R.I.H with shifting tool
28-Mar-99	18:54	Tagged fluid at 345m - R.I.H to 1350m
28-Mar-99	19:15	Sit down at 1414m
28-Mar-99	20:00	Jarred down for 30 minutes - unable to get BO shifting tool into S.S.D
28-Mar-99	20:50	P.O.O.H
28-Mar-99	21:15	O.O.H with shifting tool
28-Mar-99	22:40	Made up 5 1/2" scratch bar
29-Mar-99	0:40	Opened swab and crown valves
29-Mar-99	0:45	R.I.H with brush
29-Mar-99	1:20	Run through S.S.D at 1415 meters
29-Mar-99	2:00	O.O.H - Shut in and bled down lubricator
29-Mar-99	2:35	Fitted BO shifting tool to toolstring
29-Mar-99	2:40	R.I.H to close S.S.D
29-Mar-99	3:05	Sat down at 1415m
29-Mar-99	3:25	Jarred down then pull up

HALLIBURTON ENERGY SERVICES

PRODUCTION TEST DETAIL REPORT
SEQUENCE OF OPERATIONS

CUSTOMER : Western Underground Gas Storage
TEST No. : Production Flowback - 1
WELL : Iona - 4
RIG NAME : O.D.E #30

DATE	TIME	OPERATIONS
29-Mar-99	3:45	Try again
29-Mar-99	4:00	No luck - cannot pass through S.S.D - P.O.O.H
29-Mar-99	4:15	O.O.H - unstabbed lubricator and checked tool - Lots of heavy grease
29-Mar-99	4:35	Added knuckle joint between stem and jars - restabbed and equalised
29-Mar-99	4:40	R.I.H
29-Mar-99	5:10	Jarred down - not able to pass through S.S.D
29-Mar-99	5:30	P.O.O.H - fuel problem
29-Mar-99	6:10	Restarted unit - crew change
29-Mar-99	7:15	O.O.H - changed out tools to run 3.813" XXN plug
29-Mar-99	7:30	R.I.H with 3.813" XXN plug - not able to set plug in XXN nipple
29-Mar-99	9:00	O.O.H - inspection of plug showed a thin layer of tacky grease/sealant
29-Mar-99	9:20	Abandoned wireline/plug procedure - prepared to pull tubing
29-Mar-99	10:00	Rigged down wireline equipment
30-Mar-99	6:00	Commenced displacing tubing to N2 - returns back to trip tank
30-Mar-99	7:00	15 bbls displaced - continue displacing
30-Mar-99	7:25	22 bbls displaced - continued displacing brine with N2
30-Mar-99	7:45	25 bbls displaced - stopped displacing
30-Mar-99	7:50	Held pressure on tubing - latched back into packer and landed out
30-Mar-99	7:55	Rigged up to bleed N2 off tubing
30-Mar-99	8:05	Commenced bleeding N2 off through choke manifold
30-Mar-99	8:16	Continued bleeding N2 off through Lo-Torq valve on top of tubing
30-Mar-99	8:30	Commenced rigging up Xmas tree
30-Mar-99	8:35	Commence pressure test on annulus to 2000 psi
30-Mar-99	8:35	Continued bleeding off N2 from tubing
30-Mar-99	8:54	Increased bleed rate of N2
30-Mar-99	9:05	Tubing bled to 0 psi
30-Mar-99	9:10	Finished annulus pressure test - OK
30-Mar-99	9:25	Commenced rigging up Xmas tree onto well
30-Mar-99	10:30	Picked up and connected Coflexip hose to tree
30-Mar-99	10:47	Picked up lubricator to drill floor
30-Mar-99	10:55	Closed Lower Master Valve (L.M.V) on tree

HALLIBURTON ENERGY SERVICES

PRODUCTION TEST DETAIL REPORT
SEQUENCE OF OPERATIONS

CUSTOMER : Western Underground Gas Storage
TEST No. : Production Flowback - 1
WELL : Iona - 4
RIG NAME : O.D.E #30

DATE	TIME	OPERATIONS
30-Mar-99	11:00	Rigged up to pressure test across Xmas tree & lubricator to choke manifold
30-Mar-99	11:15	Flushed lines across top of tree to choke
30-Mar-99	11:17	Commenced pressure test of lubricator/tree to choke manifold to 3000 psi
30-Mar-99	11:20	Lubricator leaking - bled off pressure
30-Mar-99	11:24	Pumped up on lubricator stuffing box
30-Mar-99	11:30	Laid lubricator down to repair leak
30-Mar-99	11:49	Flushed across tree to choke again
30-Mar-99	11:50	Commenced pressure test to 3000 psi
30-Mar-99	12:05	Pressure test good - bled off through choke manifold
30-Mar-99	12:05	Rigged up N2 bottles to pressure test tubing to 2000 psi
30-Mar-99	12:20	Held Safety meeting
30-Mar-99	12:15	Changed over N2 bottles to increase fill rate
30-Mar-99	13:30	Changed over N2 bottles
30-Mar-99	13:55	Changed over N2 bottles
30-Mar-99	15:07	Dropped TCP bar to fire guns
30-Mar-99	15:10	Indication of guns fired
30-Mar-99	15:15	Opened well to flare on 32/64" adj choke
30-Mar-99	15:20	Flowed brine to flare pit
30-Mar-99	15:30	Gas to surface
30-Mar-99	15:44	Increased choke to 40/64"adj choke
30-Mar-99	15:45	Last of brine to surface
30-Mar-99	15:45	Commenced Methanol injection
30-Mar-99	15:50	CO2 = 7% H2S = 0 ppm
30-Mar-99	15:55	Increased choke to 48/64" adjustable
30-Mar-99	16:00	BS&W = 99.5% H2O with 0.5% pipe dope/sediment
30-Mar-99	16:07	Increased choke to 56/64" adjustable
30-Mar-99	15:50	BS&W = 80% H2O and 2% sediment
30-Mar-99	16:20	CO2 = 4%
30-Mar-99	16:25	BS&W = 75% H2O and 1% sediment
30-Mar-99	16:30	Diverted flow through separator
30-Mar-99	16:35	Separator block valve worked closed - diverted flow out of and back into separator

HALLIBURTON ENERGY SERVICES

PRODUCTION TEST DETAIL REPORT
SEQUENCE OF OPERATIONS

CUSTOMER : Western Underground Gas Storage
TEST No. : Production Flowback - 1
WELL : Iona - 4
RIG NAME : O.D.E #30

DATE	TIME	OPERATIONS
30-Mar-99	16:48	Increased choke to 64/64" adjustable
30-Mar-99	16:50	Increased choke to 72/64" adjustable
30-Mar-99	16:51	Suspect WHP transducer - changed out - readings n/a
30-Mar-99	16:59	Increased choke to 84/64" adjustable
30-Mar-99	17:00	Stopped Methanol injection at choke manifold
30-Mar-99	17:07	Installed 3.750" orifice plate
30-Mar-99	17:15	Pressure transducer changed out - WHP readings online again
30-Mar-99	17:20	
30-Mar-99	17:30	Gas gravity = 0.678
30-Mar-99	17:45	CO2 = 7.0% H2S = 0 ppm
30-Mar-99	17:50	BS&W not available - not enough fluid at choke
30-Mar-99	18:00	Gas gravity = 0.678
30-Mar-99	18:30	Commenced taking 1st H.P gas sample
30-Mar-99	18:40	Finished taking 1st H.P gas sample
30-Mar-99	18:45	Commenced taking 2nd H.P gas sample
30-Mar-99	18:55	Finished taking 2nd H.P gas sample
30-Mar-99	19:00	Lifted 3.750" orifice plate
30-Mar-99	19:04	Closed well in at choke manifold
30-Mar-99	19:20	R.I.H with XXN plug
30-Mar-99	19:55	Plug set - P.O.O.H
30-Mar-99	20:34	O.O.H - Closed L.M.V and bled off lubricator
30-Mar-99	20:50	Opened swab valve - bled tubing down to 1000 psi
30-Mar-99	21:22	Monitored tubing pressure for 15 minutes
30-Mar-99	21:45	Plug held OK
30-Mar-99	21:53	Rigged down slickline lubricator
30-Mar-99	23:15	Completed filling tubing with brine above plug - 75 bbls
30-Mar-99	23:20	Pressured up tubing to 2000 psi
30-Mar-99	23:30	Bled down tubing to flare
30-Mar-99	23:45	Closed choke to allow gas to break out of brine
31-Mar-99	0:10	Opened choke to bleed down tubing again
31-Mar-99	0:20	Closed choke - no gas at surface (WHP = 1450 psi)

HALLIBURTON ENERGY SERVICES

PRODUCTION TEST DETAIL REPORT
SEQUENCE OF OPERATIONS

CUSTOMER : Western Underground Gas Storage
TEST No. : Production Flowback - 1
WELL : Iona - 4
RIG NAME : O.D.E #30

DATE	TIME	OPERATIONS
31-Mar-99	0:35	Increased tubing pressure to 2000 psi (WHP = 1458 psi)
31-Mar-99	0:40	WHP = 1980 psi - Pumped another 10 bbls
31-Mar-99	1:10	Opened choke to flare - no gas
31-Mar-99	1:16	Closed choke
31-Mar-99	1:55	Opened choke to flare
31-Mar-99	2:10	Flare pilot out - closed choke
31-Mar-99	2:15	Relit pilot OK
31-Mar-99	2:20	Opened choke to flare
31-Mar-99	3:05	WHP = 500 psi - closed choke
31-Mar-99	3:10	Started pumping fluid into tubing
31-Mar-99	3:11	Total fluid pumped into tubing = 134 bbls
31-Mar-99	3:30	Stopped pumping into tubing
31-Mar-99	4:05	Opened choke to bleed off tubing
31-Mar-99	4:32	Bled down tubing to flare
31-Mar-99	4:35	Closed choke - no gas - monitored for 30 minutes
31-Mar-99	5:00	Bled down gas in tubing to flare
31-Mar-99	5:00	Small shows of gas at flare
31-Mar-99	6:00	WHP = 0 psi - no gas evident at flare
31-Mar-99	6:07	Pumped brine into tubing
31-Mar-99	6:43	Total brine pumped into tubing = 193.4 bbls
31-Mar-99	7:00	Commenced rigging down S.T.E/D.A.S equipment
31-Mar-99	7:05	Special note: Length of pipe work from test tree to choke
31-Mar-99	7:05	manifold was 70 feet x 2.5" I.D.
31-Mar-99	7:00	Opened separator hatch & visually inspected for sand production - no traces of sand
31-Mar-99	8:00	Sample of sludge/black grease taken
31-Mar-99	8:00	Commenced rigging down equipment to move to Iona - 2

HALLIBURTON

SURFACE SAMPLING DATA

TEST NUMBER	RATE NUMBER	AREA	DATE (DAY:MO:YY)	PAGE OF
Production Flowback	1	South-West Victoria	30/3/99	1 2

CUSTOMER	WELL NAME OR NUMBER	FIELD	FORMATION
Western Underground Gas Storage Pty Ltd	Iona #4	Development	C1 Warre

ELEVATION MTRS	STANDARD CONDITIONS	TIME WELL FLOWING OR SHUT IN BEFORE SAMPLING	INTERVAL TESTED MTRS
	[X] 14.73 psi @ 60°F [ ] OTHER PRESS TEMP	03:20:00 [X] HOURS [ ] DAYS	1454 - 1467 mKB

GAS SAMPLE # 1 CONTAINER # 3052A

TIME TAKEN	CONTAINER VOLUME (CC or GAL)	INITIALLY FILLED WITH (a)	(b) VOLUME OF FILL REMAINING W/SAMPLE	CONTAINER SHIPPING PRESSURE (PSIG)	SAMPLE TYPE	SAMPLE TAKEN AT	SAMPLING PRESSURE (PSIG)	SAMPLING TEMP (°F)	ATMOSPHERIC PRESSURE (PSI)	ATMOSPHERIC TEMPERATURE (°F)	TIME TO TAKE SAMPLE (MIN)
18:30	20 Litres	Vacuum	0.0	995.5	Gas	Separator	995.5	79.4	14.73	61.0	5 mins

FIELD READINGS AND FACTORS USED

WELLHEAD PRESS (psig)	WELLHEAD TEMP (°F)	CHOKE SIZE (64ths)	HI STAGE SEP PRESS (psig)	HI STAGE SEP TEMP (°F)	LO STAGE SEP PRESS (psig)	LO STAGE SEP TEMP (°F)	BOTTOMHOLE PRESS (psig) @Mtrs	BOTTOMHOLE TEMP (°F) @Mtrs	OIL GRAVITY @ 60°F (°API)	OIL BS&W (%)	OIL C_f (c)	OIL W_f	GAS GRAVITY (Air = 1)	GAS F_{pv}	OIL/GAS RATIOS AT: [X] STOCK TANK GOR mscf/bbl	OIL/GAS RATIOS AT: [ ] SEP COND OGR bbl/mmscf	TOTAL GAS/OIL FLOW RATE AT: [X] STOCK TANK mmscf/d	TOTAL GAS/OIL FLOW RATE AT: [ ] SEP COND stb/d	WATER FLOW RATE (bpd)
1244.8	80.8	84	995.5	79.4					n/a	n/a	1.0000	1.0000	0.678	1.0840000	n/a	n/a	51.15	n/a	n/a

REMARKS
Rates/pressures are from 18:35 reading
Liquids were produced to the separator but were too small to measure

OIL SAMPLE # - CONTAINER # -

TIME TAKEN	CONTAINER VOLUME (CC or GAL)	INITIALLY FILLED WITH (a)	(b) VOLUME OF FILL REMAINING W/SAMPLE	CONTAINER SHIPPING PRESSURE (PSIG)	SAMPLE TYPE	SAMPLE TAKEN AT	SAMPLING PRESSURE (PSIG)	SAMPLING TEMP (°F)	ATMOSPHERIC PRESSURE (PSI)	ATMOSPHERIC TEMPERATURE (°F)	TIME TO TAKE SAMPLE (MIN)

FIELD READINGS AND FACTORS USED

WELLHEAD PRESS (psig)	WELLHEAD TEMP (°F)	CHOKE SIZE (64ths)	HI STAGE SEP PRESS (psig)	HI STAGE SEP TEMP (°F)	LO STAGE SEP PRESS (psig)	LO STAGE SEP TEMP (°F)	BOTTOMHOLE PRESS (psig) @Mtrs	BOTTOMHOLE TEMP (°F) @Mtrs	OIL GRAVITY @ 60°F (°API)	OIL BS&W (%)	OIL C_f (c)	OIL W_f	GAS GRAVITY (Air = 1)	GAS F_{pv}	OIL/GAS RATIOS AT: [ ] STOCK TANK GOR mscf/bbl	OIL/GAS RATIOS AT: [ ] SEP COND OGR bbl/mmscf	TOTAL GAS/OIL FLOW RATE AT: [ ] STOCK TANK mmscf/d	TOTAL GAS/OIL FLOW RATE AT: [ ] SEP COND stb/d	WATER FLOW RATE (bpd)

REMARKS

SAMPLE # CONTAINER

TIME TAKEN	CONTAINER VOLUME (CC or GAL)	INITIALLY FILLED WITH (a)	(b) VOLUME OF FILL REMAINING W/SAMPLE	CONTAINER SHIPPING PRESSURE (PSIG)	SAMPLE TYPE	SAMPLE TAKEN AT	SAMPLING PRESSURE (PSIG)	SAMPLING TEMP (°F)	ATMOSPHERIC PRESSURE (PSI)	ATMOSPHERIC TEMPERATURE (°F)	TIME TO TAKE SAMPLE (MIN)

FIELD READINGS AND FACTORS USED

WELLHEAD PRESS (psig)	WELLHEAD TEMP (°F)	CHOKE SIZE (64ths)	HI STAGE SEP PRESS (psig)	HI STAGE SEP TEMP (°F)	LO STAGE SEP PRESS (psig)	LO STAGE SEP TEMP (°F)	BOTTOMHOLE PRESS (psig) @Mtrs	BOTTOMHOLE TEMP (°F) @Mtrs	OIL GRAVITY @ 60°F (°API)	OIL BS&W (%)	OIL C_f (c)	OIL W_f	GAS GRAVITY (Air = 1)	GAS F_{pv}	OIL/GAS RATIOS AT: [ ] STOCK TANK GOR scf/bbl	OIL/GAS RATIOS AT: [ ] SEP COND OGR bbl/mmscf	TOTAL GAS/OIL FLOW RATE AT: [ ] STOCK TANK mmscf/d	TOTAL GAS/OIL FLOW RATE AT: [ ] SEP COND stb/d	WATER FLOW RATE (bpd)

REMARKS

SAMPLED BY: HALLIBURTON

(a) CONTAINER MAY BE FILLED OR INITIALLY FILLED WITH WATER, MERCURY (Hg), OR BE EVACUATED (VACUUM).
(b) VOLUME OF WATER OR MERCURY LEFT WITH WELL EFFLUENT SAMPLE.
(c) [illegible] CORRECTION FACTOR FOR CORRECTING OIL VOLUME FROM SEPARATOR TO STOCK TANK CONDITIONS. IT INCLUDES WEATHERING FACTOR.
WF AND METER [illegible] M x WF

908910 064

HALLIBURTON

SURFACE SAMPLING DATA

TEST NUMBER	RATE NUMBER	AREA	DATE (DAY:MO:YY)	PAGE OF
Production Flowback	1	South-West Victoria	30/3/99	2 / 2

CUSTOMER	WELL NAME OR NUMBER	FIELD	FORMATION
Western Underground Gas Storage Pty Ltd	Iona #4	Development	C1 Warre

ELEVATION: MTRS | STANDARD CONDITIONS: [X] 14.73 psi @ 60°F [ ] OTHER PRESS TEMP

TIME WELL FLOWING OR SHUT IN BEFORE SAMPLING: 03:25:00 [X] HOURS [ ] DAYS

INTERVAL TESTED MTRS: 1454 - 1467 mKB

GAS SAMPLE # 2 CONTAINER # 3043A

TIME TAKEN	CONTAINER VOLUME (CC or GAL)	INITIALLY FILLED WITH (a)	(b) VOLUME OF FILL REMAINING W/SAMPLE	CONTAINER SHIPPING PRESSURE (PSIG)	SAMPLE TYPE	SAMPLE TAKEN AT	SAMPLING PRESSURE (PSIG)	SAMPLING TEMP (°F)	ATMOSPHERIC PRESSURE (PSI)	ATMOSPHERIC TEMPERATURE (°F)	TIME TO TAKE SAMPLE (MIN)
18.45	20 Litres	Vacuum	0.0	996.1	Gas	Separator	996.1	79.8	14.73	61.0	5 mins

FIELD READINGS AND FACTORS USED

WELLHEAD PRESS (psig)	WELLHEAD TEMP (°F)	CHOKE SIZE (64ths)	HI STAGE SEP PRESS (psig)	HI STAGE SEP TEMP (°F)	LO STAGE SEP PRESS (psig)	LO STAGE SEP TEMP (°F)	BOTTOMHOLE PRESS (psig) @Mtrs	BOTTOMHOLE TEMP (°F) @Mtrs	OIL GRAVITY @ 60°F (°API)	OIL BS&W (%)	OIL C_f (c)	OIL W_f	GAS GRAVITY (Air = 1)	GAS F_{pv}	OIL/GAS RATIOS AT: [X] STOCK TANK GOR	[ ] SEP COND OGR	TOTAL GAS/OIL FLOW RATE AT: [X] STOCK TANK mmscf/d	[ ] SEP COND stb/d	WATER FLOW RATE (bpd)
1215.6	89.3	84	996.1	79.8					n/a	n/a	1.0000	1.0000	0.678	1.0840000	n/a mscf/bbl	n/a bbl/mmscf	50.965	n/a	n/a

REMARKS:
Rates/pressures are from 18:50 reading
Liquids were produced to the separator but were too small to measure.

OIL SAMPLE # - CONTAINER # -

TIME TAKEN	CONTAINER VOLUME (CC or GAL)	INITIALLY FILLED WITH (a)	(b) VOLUME OF FILL REMAINING W/SAMPLE	CONTAINER SHIPPING PRESSURE (PSIG)	SAMPLE TYPE	SAMPLE TAKEN AT	SAMPLING PRESSURE (PSIG)	SAMPLING TEMP (°F)	ATMOSPHERIC PRESSURE (PSI)	ATMOSPHERIC TEMPERATURE (°F)	TIME TO TAKE SAMPLE (MIN)

FIELD READINGS AND FACTORS USED

WELLHEAD PRESS (psig)	WELLHEAD TEMP (°F)	CHOKE SIZE (64ths)	HI STAGE SEP PRESS (psig)	HI STAGE SEP TEMP (°F)	LO STAGE SEP PRESS (psig)	LO STAGE SEP TEMP (°F)	BOTTOMHOLE PRESS (psig) @Mtrs	BOTTOMHOLE TEMP (°F) @Mtrs	OIL GRAVITY @ 60°F (°API)	OIL BS&W (%)	OIL C_f (c)	OIL W_f	GAS GRAVITY (Air = 1)	GAS F_{pv}	OIL/GAS RATIOS AT: [ ] STOCK TANK GOR	[ ] SEP COND OGR	TOTAL GAS/OIL FLOW RATE AT: [ ] STOCK TANK mmscf/d	[ ] SEP COND stb/d	WATER FLOW RATE (bpd)
															mscf/bbl	bbl/mmscf			

REMARKS:

SAMPLE # CONTAINER

TIME TAKEN	CONTAINER VOLUME (CC or GAL)	INITIALLY FILLED WITH (a)	(b) VOLUME OF FILL REMAINING W/SAMPLE	CONTAINER SHIPPING PRESSURE (PSIG)	SAMPLE TYPE	SAMPLE TAKEN AT	SAMPLING PRESSURE (PSIG)	SAMPLING TEMP (°F)	ATMOSPHERIC PRESSURE (PSI)	ATMOSPHERIC TEMPERATURE (°F)	TIME TO TAKE SAMPLE (MIN)

FIELD READINGS AND FACTORS USED

WELLHEAD PRESS (psig)	WELLHEAD TEMP (°F)	CHOKE SIZE (64ths)	HI STAGE SEP PRESS (psig)	HI STAGE SEP TEMP (°F)	LO STAGE SEP PRESS (psig)	LO STAGE SEP TEMP (°F)	BOTTOMHOLE PRESS (psig) @Mtrs	BOTTOMHOLE TEMP (°F) @Mtrs	OIL GRAVITY @ 60°F (°API)	OIL BS&W (%)	OIL C_f (c)	OIL W_f	GAS GRAVITY (Air = 1)	GAS F_{pv}	OIL/GAS RATIOS AT: [ ] STOCK TANK GOR	[ ] SEP COND OGR	TOTAL GAS/OIL FLOW RATE AT: [ ] STOCK TANK mmscf/d	[ ] SEP COND stb/d	WATER FLOW RATE (bpd)
															scf/bbl	bbl/mmscf			

REMARKS:

(a) CONTAINER MAY BE FILLED OR INITIALLY FILLED WITH WATER, MERCURY (Hg), OR BE EVACUATED (VACUUM).
(b) VOLUME OF WATER OR MERCURY LEFT WITH WELL EFFLUENT SAMPLE.
(c) CORRECTION FACTOR FOR CORRECTING OIL VOLUME FROM SEPARATOR TO STOCK TANK CONDITIONS. IT INCLUDES WEATHERING FACTOR.
WF AND METER CORRECTION FACTOR ... M x Wf

SAMPLED BY: HALLIBURTON

WELL TEST DATA REPORT

COMPANY : WESTERN UNDERGROUND GAS STORAGE PTY LTD

WELL : IONA - 4

TEST NO. : COMPLETION/CLEANUP PROGRAM

DATE : 09-MAY-99 TO 11-MAY-99

HALLIBURTON

HALLIBURTON

19TH MAY. 1999

WESTERN UNDERGROUND GAS STORAGE PTY LTD
LEVEL 49, 525 COLLINS STREET
MELBOURNE 3000
VICTORIA
AUSTRALIA

Attention: Petroleum Operations and Quality Systems Superintendent.

Dear Sir,

Please find enclosed the report for the COMPLETION/CLEANUP PROGRAM on IONA - 4 and 5 during the period 9th May to 11th May 1999.

We trust this report is complete and to your satisfaction. Should you have any questions please do not hesitate to contact us.

It has been a pleasure to be of service to you and we hope to have the opportunity to do so again in the future.

Yours sincerely

for

GARY GIANCASPRO
Data Acquisition Specialist
HALLIBURTON AUSTRALIA PTY LTD

DISCLAIMER

These calculations are based on certain data, assumptions and applied mathematical methods. Inaccurate well data, changing well conditions, tolerance variations of mechanical components, mechanical malfunctions and other factors may affect these calculations.

HALLIBURTON AUSTRALIA PTY. LTD. ('H.E.S')

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TEST EQUIPMENT

IONA - 4 & 5 COMPLETION/CLEANUP PROGRAM

CHOKE MANIFOLD FOLEY 3 1/16" 10,000 PSI

1 X HALLIBURTON HYDRAULIC FLOW WING SAFETY VALVE

TEXSTEAM & HASKELL CHEMICAL INJECTION PUMPS

ASSOCIATED PIPEWORK AND COFLEXIP HOSE(S)

S.T.E TEST LABORATORY

FLOWLINE - PRODUCTION TREE TO CHOKE MANIFOLD

IONA - 4 & 5 COMPLETION/CLEANUP PROGRAM

ITEM	DESCRIPTION	ID (Inches)	LENGTH
1	COFLEXIP HOSE	2.50	60.0
2	DATA HEADER	3.00	2.75
3	CHOKE MANIFOLD TO BEAN	3.00	2.90

HALLIBURTON

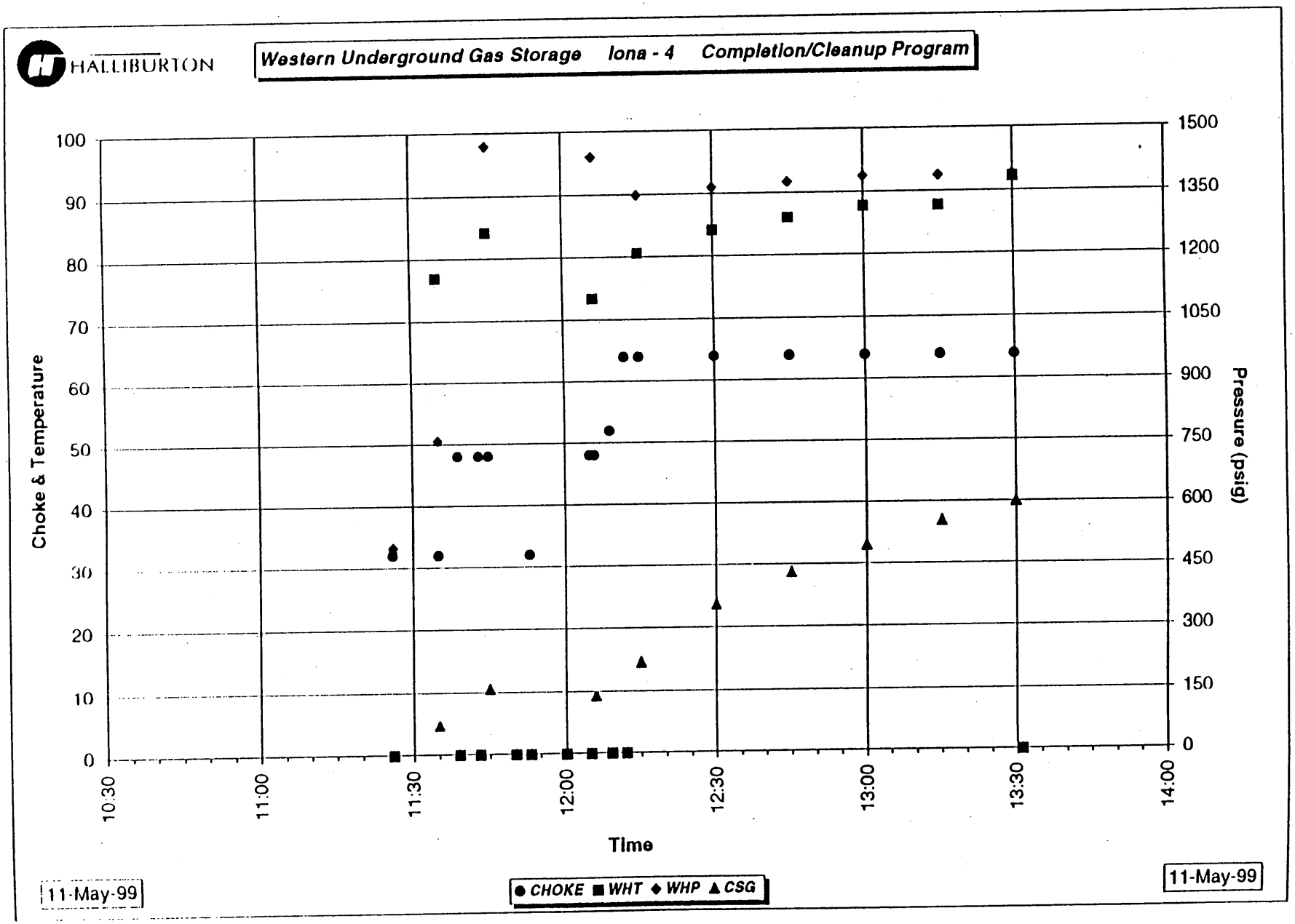
WELL TEST DATA SHEET

BASE: Australia

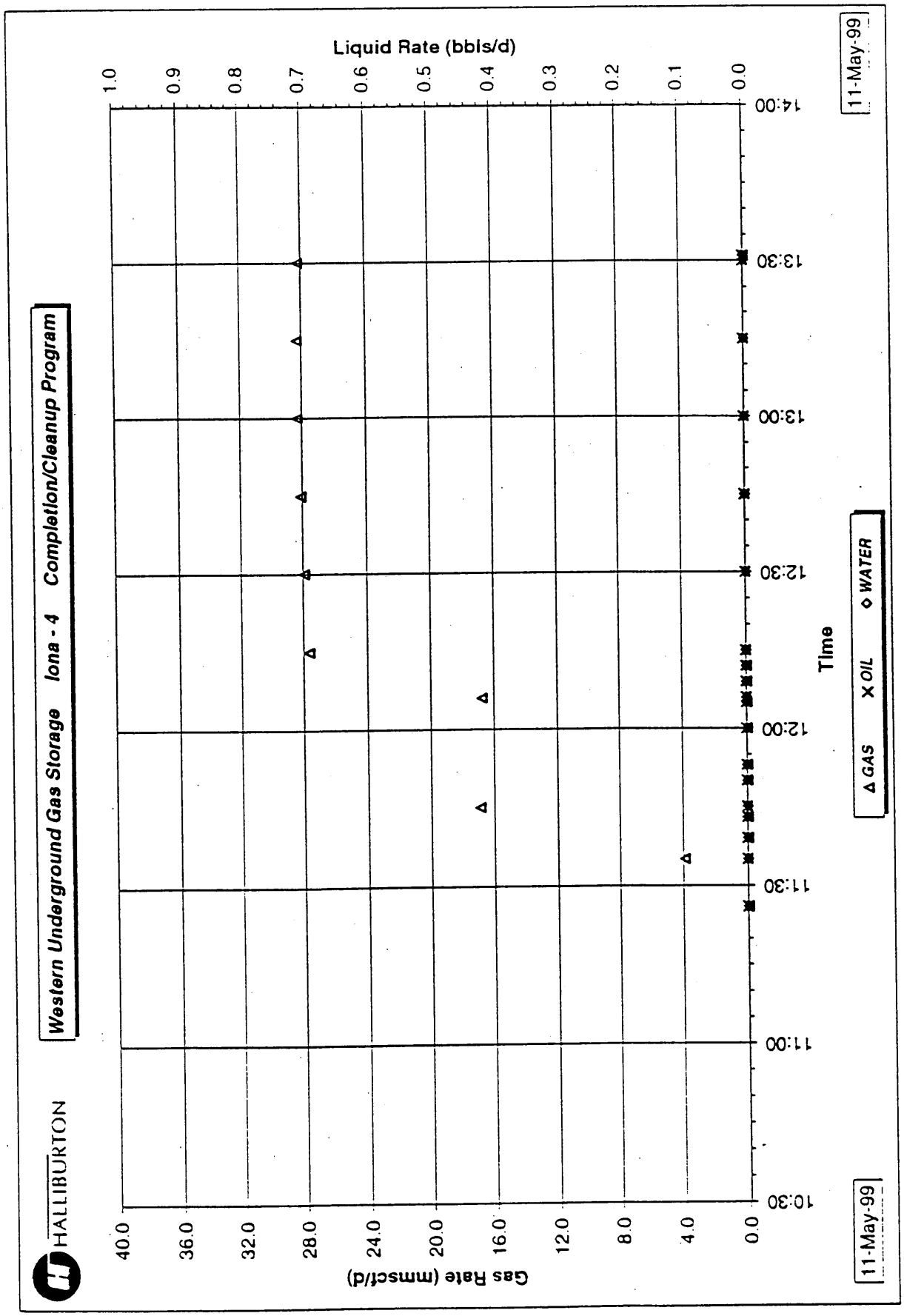
CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 4
DATE : 11th May 10:45 - 11th May 16:00
RIG :

PERFORATION INTERVAL : 1454 - 1467 mKB
TEST No. : Completion/Cleanup Program
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Michael Hodge

DATE & TIME	CHOKE				CSG	FLOW RATES			GOR	SEPARATOR				CUMMLATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	WHP	WHT		GAS	OIL	WATER		PRES.	TEMP.	BS&W	WCT	GAS	OIL	WATER	OIL	GAS	**Gas Rates are estimated only - using choke nipple Coefficient
(dd-mmm hh:mm)	(64ths)	(%)	(psig)	(°F)	(psig)	(MMscfd)	(bpd)	(bpd)	mscf/bbl	(psig)	(°f)	(%)	(%)	(MMscf)	(bbls)	(bbls)	(API@60°f)	(Air=1)	
11 May 11:26	32		500																Opened well to flare on 32/64" adjustable WHP = 500 psi
11 May 11:35	32		760	77	70	3.91												0.684	
11 May 11:39	48																		Increased choke to 48/64" adjustable
11 May 11:43	48																		Gas to surface
11 May 11:45	48		1470	84	160	16.91												0.684	
11 May 11:50																			Shut in well at choke manifold to repair leak in flow line
11 May 11:53	32																		Opened well to flare on 32/64" adjustable
11 May 12:00																			Shut well in - relight gas flare pilot
11 May 12:05	48																		Opened well to flare on 48/64" adjustable
11 May 12:06	48		1442	73	140	16.76												0.684	
11 May 12:09	52																		Increased choke to 52/64" adjustable
11 May 12:12	64																		Increased choke to 64/64" adjustable
11 May 12:15	64		1348	81	220	27.66												0.684	
11 May 12:30	64		1365	84	355	27.92												0.684	
11 May 12:45	64		1376	86	430	28.10												0.684	
11 May 13:00	64		1388	88	495	28.30												0.684	
11 May 13:15	64		1388	88	555	28.30												0.684	
11 May 13:30	64		1390	92	600	28.22												0.684	
11 May 13:31																			Closed wing valve on production tree and bled line off through choke
11 May 13:31																			Closed wing valve on production tree and bled line off through choke
11 May 15:00																			Flowed well back to flare for Television camera crew
11 May 16:00																			Rigged down S.T.E



Wellhead Plot



Production Plot

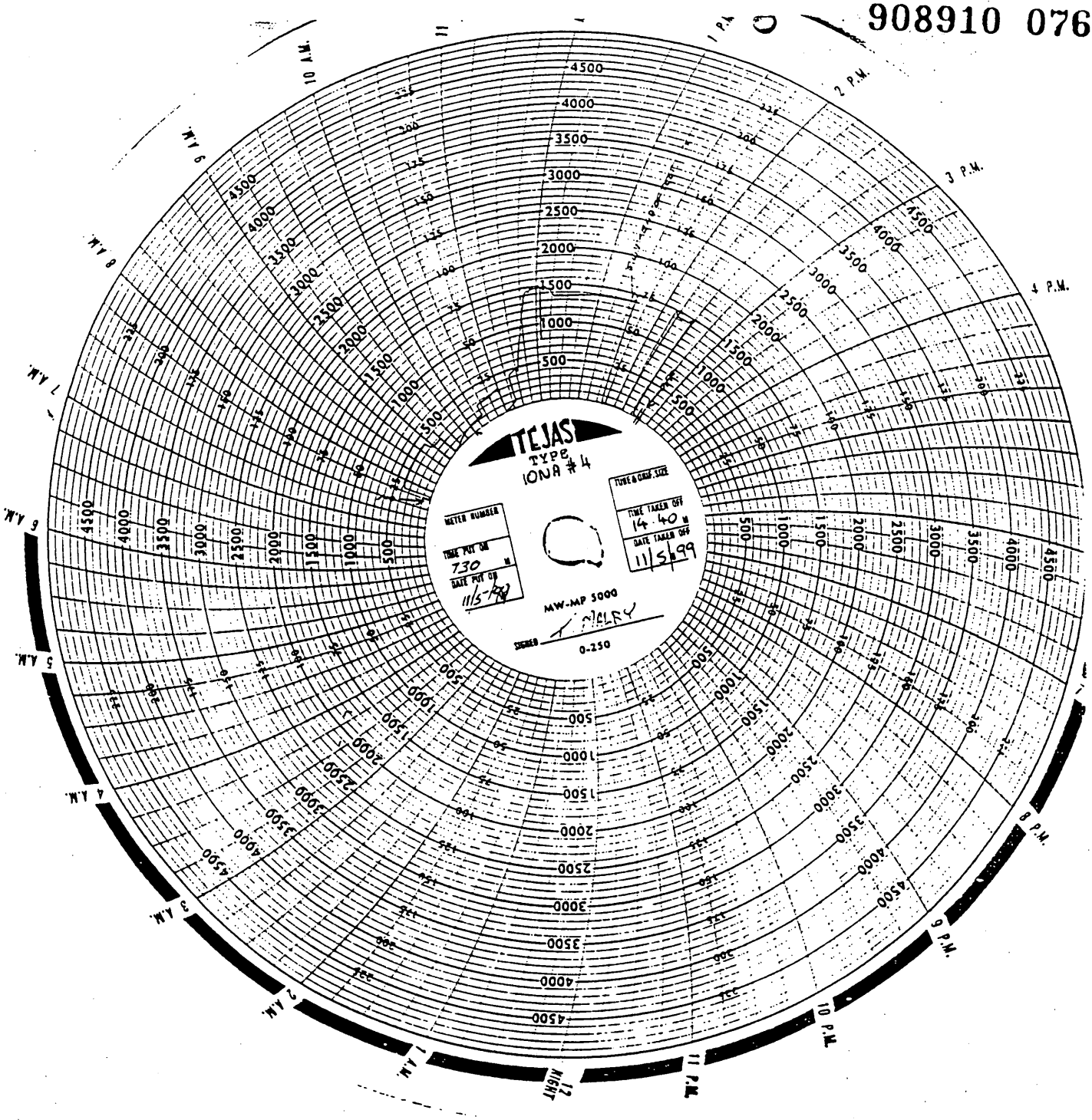
HALLIBURTON ENERGY SERVICES

PRODUCTION TEST DETAIL REPORT
SEQUENCE OF OPERATIONS

CUSTOMER : Western Underground Gas Storage
ST No. : Completion/Cleanup Program
WELL : Iona - 4
RIG NAME :

DATE	TIME	OPERATIONS
10-May-99	7:00	Halliburton crew prepare surface test line between wellhead and choke
10-May-99	7:00	manifold/flare line
10-May-99	10:00	Installed production tree to well
10-May-99	11:00	Pulled Back Pressure Valve from tubing hanger
10-May-99	12:00	Rigged up remaining surface test lines to wellhead
10-May-99	13:30	Rigged up slickline equipment
10-May-99	14:00	Pressure tested slickline lubricator
10-May-99	14:30	R.I.H to open S.S.D
10-May-99	15:00	S.S.D opened OK - P.O.O.H
10-May-99	15:15	Commenced displacing tubing with N2
10-May-99	16:00	Finished displacing tubing with N2
10-May-99	16:30	Pressure tested surface test lines to choke manifold from wellhead
10-May-99	16:50	R.I.H to close S.S.D
10-May-99	18:00	S.S.D closed - O.O.H and laid down lubricator
11-May-99	7:45	PIcked up lubricator - R.I.H to pull XXN plug from XN nipple
11-May-99	11:00	O.O.H - XXN plug pulled - OK
11-May-99	11:05	Lit gas flare pilot at flare pit
11-May-99	11:14	Opened master valve and lined well up to choke manifold
11-May-99	11:26	Opened well to flare on 32/64" adjustable - WHP = 500 psi
11-May-99	11:39	Increased choke to 48/64" adjustable
11-May-99	11:43	Gas to surface
11-May-99	11:50	Shut in well at choke manifold to repair leak in flow line
11-May-99	11:53	Opened well to flare on 32/64" adjustable
11-May-99	12:00	Shut well in - relight gas flare pilot
11-May-99	12:05	Opened well to flare on 48/64" adjustable
11-May-99	12:09	Increased choke to 52/64" adjustable
11-May-99	12:12	Increased choke to 64/64" adjustable
11-May-99	13:31	Shut well in at choke - End of Test
11-May-99	13:31	Closed wing valve on production tree and bled line off through choke
11-May-99	15:00	Flowed well back to flare for Television camera crew
11-May-99	16:00	Rigged down S.T.E

908910 076


TEJAS
TYPE
IONA #4
METER NUMBER
TIME PUT ON
730 M
DATE PUT ON
11/5/99
TUBE & ORIF. SIZE
TIME TAKEN OFF
14 40 M
DATE TAKEN OFF
11/5/99
MW-MP 5000
SIGNED
0-250
12 NIGHT
1 A.M.
2 A.M.
3 A.M.
4 A.M.
5 A.M.
6 A.M.
7 A.M.
8 A.M.
9 A.M.
10 A.M.
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1 P.M.
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11 P.M.

APPENDIX 9

Drilling fluid recap by Baroid

WESTERN UNDERGROUND GAS STORAGE
DRILLING FLUID RECAP
IONA - 4
PPL - 2 OTWAY BASIN, VICTORIA

Prepared by : Gerald Lange
: Alan Searle

Date : March, 1999

Table Of Contents

1. WELL SUMMARY

1.1 Well Data

Well Name	:	Iona - 4
Operator	:	Western Underground Gas Storage Pty Ltd.
Well Type	:	Directional
Maximum Deviation & Direction	:	48.8° / 264.2° relative to north
Horizontal Displacement at TD	:	502.3 m
Bottom Hole Temperature	:	62 °C
Location	:	PPL-2 Otway Basin, Victoria
Contractor/Rig	:	OD & E Rig 30
Start Date (Rig move)	:	1st March, 1999
Spud Date	:	6th March, 1999
RKB to Ground level	:	4.66 m
RKB to Wellhead	:	5.08 m
Total Depth	:	1560 m.
Date TD Reached (Set 9⅝" casing)	:	25th March, 1999
Total Days Drilling	:	25 days
Date Released	:	31st March, 1999
Total Days on Well	:	31

1.2 Formation Tops

TVD values in italics have been extrapolated from adjacent Sperry-Sun survey points

Formation		MD (m) KB	TVD (m) KB	Inclination (deg)
Heytesbury Group (undifferentiated)		surface	surface	0
Narrawaturk Marl		-	-	-
Mepunga Formation		285	285	0.1
Dilwyn Formation		339	339	0.1
Pember Mudstone		532	532	0.2
Pebble Point Formation		602.5	602.5	0.25
Paaratte Formation		671	671	2.5
Skull Creek Member		1043.8	*1016*	37
Nullawarre Greensand		1219	*1141*	47
Belfast Mudstone		1359.9	*1238*	48.8
Waare Formation	D unit	1417.2	*1276*	48.8
	C1 sand	1453.4	*1300*	48.8
	C2 sand	1470.6	*1306*	48.8
	B sand	1514	*1339*	48.8
Total Depth		1560	1369.7	48.8

1.3 Casing Program

20"	Conductor		@	5m
$13^{3}/_{8}$"	Intermediate Casing	K 55, 54.5 #	@	504m
$9^{5}/_{8}$"	Production Casing	L 80, 40.0 #	@	1557m
$5^{1}/_{2}$"	Completion Tubing	L 80, 17.0 #	to	1418m

1.4 Personnel

Drilling Supervisors	:	Wally Westman	Ian Zurakowski	Jack Lambert
Baroid Field Service Reps.	:	Gerald Lange	Alan Searle	

2.

COST SUMMARY

2.1 Drilling Fluid Costs

	Drilling Fluid	Hole Size	MD From	MD To	Cost (AUD$)
1.	KCl / EZ-MUD / Polymer	17 1/2"	5m	639m	31,867.95
	AQUAGEL for cementing				565.82
					32,433.77
2.	KCl / EZ-MUD / Polymer	12 1/4"	639m	1560m	70,960.81
Mud Materials Used For Drilling				**Total AUD$**	**102,828.76**
Mud Materials Used For Completion				**AUD$**	**5909.89**
8.6 ppg KCl Brine					
Total Materials				**AUD$**	**109,304.47**

2.2 Engineering Costs

Service Representatives	From (date)	To (date)	Days
Gerald Lange	1/03/99	16/03/99	16
Alan Searle	17/03/99	31/03/99	15
Total Days			**31**
Service Cost @	**$650.00 per day**	**Total AUD$**	**20,150.00**

Vehicle @ $ 100.00 / day		**31 days**	**3,100.00**
Mileage @ $ 1.00 / km.	**91867 km to 93262 km**	**1395 km.**	**1395.00**

TOTAL COSTS **AUD$ 133,949.47**

3. PERFORMANCE SUMMARY

3.1 Comments

- Iona-4 was successfully drilled, utilising a KCl / EZ-MUD / Polymer fluid to provide optimal inhibition of the clays encountered in this area.
- $13^3/_8$" casing became stuck at 504m leaving 135m of exposed $17^1/_2$" rathole, this was not considered to be a mud related problem.
- During cementing of the $13^3/_8$" casing, the mud in the $17^1/_2$" rathole became severely contaminated with cement and this in turn affected the remainder of the circulating system. Contamination was too severe, pH > 12.5, to be treated with sodium bicarbonate and citric acid. There was no choice but to dump and rebuild the active mud system.
- Extensive reaming was required when running the stiffer core barrel assembly for the first coring run. Subsequent coring runs encountered no problems.

3.2 Performance Indicators

Interval 1. $17^1/_2$" Surface Hole 5 m - 639 m (634 m drilled)	**Program**	**Actual**	**Achieved (± 10 %)**
• Salvaged Mud from OBS-1	450	300	
• Volume Used, bbl	1238	1639	No
• Dilution Rate, bbl/m	1.5	1.51	Yes
• Consumption Rate, bbl/m	2.38	2.59	Yes
• Mud Cost/bbl., A$	22.23	19.44	Yes
• Mud Cost/m., A$	52.82	50.26	Yes
• Interval Mud Cost, A$	27,518.91	31,867.95	No
• Drill interval with minimal mud related hole problems		None	Yes
• Minimal reaming/backreaming (<15 hrs.)		No reaming	Yes
• Successfully set casing on bottom		Casing stuck @ 504m	No

Interval 2. $12^1/_4$" Production Hole 639 m – 1560 m (921 m drilled)	**Program**	**Actual**	**Achieved (± 10 %)**
• Volume Used, bbl	1562	2457	No
• Dilution Rate, bbl/m	0.9	2.44	No
• Consumption Rate, bbl/m	1.67	2.67	No
• Mud Cost/bbl., A$	31.74	28.89	Yes
• Mud Cost/m., A$	52.85	77.05	No
• Interval Mud Cost, A$	49,575.51	70,960.81	No
• Drill interval with minimal mud related hole problems		None	Yes
• Minimal reaming/backreaming (<15 hrs.)		29.5 hours	No
• Successfully run wireline logs		Run to 1554m	Yes
• Successfully set $9^5/_8$" production casing		Set @ 1558m	Yes
Entire Well			
• Total Drilling fluid cost A$	77,094.42	103,394.58	No
Completion Interval			
• Completion Fluid Cost, A$	8,344.11	5,208.69	No

Explanation of Non-Conformance

17 1/2" Surface Hole

- The programmed mud cost for the 17 1/2" hole interval was calculated on drilling 521 metres, but the actual length drilled was 634 metres over a 3 day period.
- The 13 3/8" casing became stuck at 504m, the cause being either hole misalignment or differential sticking. A number of hard stringers were encountered in drilling this interval and, since the 17 1/2" bottom hole assembly did not include a near bit stabiliser, it is suspected that the bit "walked" when drilling these. Resultant ledges and hole misalignment probably caused the sticking of the casing.
- Attempts to free the casing using TORQ-TRIM II as a spotting fluid and then displacing the annulus with KCl brine to reduce hydrostatic pressure, increased the overall cost for this section. Actual mud cost was A$ 31,687.95, however, deducting the sum of A$ 4,912.03 spent in trying to free the casing brings this back to A$ 26,775.92. This approximates the programmed cost of A$ 27,518.91 in spite of the additional 113m of 17 1/2" hole drilled.
- Mud cost per metre would actually have been much lower than programmed had the casing not become stuck.

12 1/4" Production Hole

- While drilling out from the 13 3/8" casing the mud was treated with sodium bicarbonate and citric acid to counter cement contamination.
- Mud in the 17 1/2" rathole below the casing was severely cement contaminated, presumably cement channelled down into the open hole. This was totally unexpected and some of this contaminated mud was displaced back into the surface pits before the problem was realised. Cement contamination of the mud raised the pH in excess of 12.5, causing polymers to break down. As the cement contamination was too severe to treat out, 819 bbls of cement contaminated mud were dumped and 686 bbls of new KCl / EZ-MUD / Polymer mud mixed, at a cost of A$ 14,220.37. Had this new mud not been required the cost for the interval would have been reduced from A$ 70,960.81 to A$ 56,740.44, still marginally higher than programmed (A$ 49,575.51)
- A 6 rpm value of at least 10 - 15 lb/100 ft^2 was requested to ensure adequate hole cleaning in the angled hole. This could only be achieved by increasing the XCD Polymer concentration to almost double that programmed. XCD Polymer is a high cost item and the cost for this individual item was A$ 12,615.59 higher than programmed.
- KCl consumption was more than double that programmed. Programmed consumption was based on the concentration required to achieve a KCl content of 3 - 4% by weight, with no allowance for depletion of KCl as it became adsorbed by the clays. Maintaining the required KCl content consumed more than twice the programmed amount of KCl, increasing the cost for this product by A$ 4,938.84
- Extensive reaming was required to get the core barrel to bottom for the initial coring run. When running a stiffer bottom hole assembly into a near gauge, deviated hole this is not unusual.

4. INTERVAL - 1

4.1 SUMMARY

17½" Hole From 5 m To 639 m In 3 Days

Drilling Fluid KCl / EZ-MUD / Polymer

Formations Heytesbury Group; Narrawaturk Marl; Mepunga Fm.; Dilwyn Fm.; Pember Mudstone; Pebble Point Fm..

Operations Summary

Iona-4 was spudded in at 21:30 hours, 6th March 1999. Drilled 17½" hole to interval TD with no problems encountered. At TD a high viscosity pill, treated with 10 ppb Kwik Seal (Fine), was circulated around to flush the hole clean; observed only a slight increase in cuttings at bottoms up. A wiper trip was made and the hole circulated clean before pulling out; there was a significant increase in cuttings at bottoms up after the wiper trip.

13⅜" casing was run to 504m. While picking up another joint, the casing became stuck. Based on casing stretch, the free point was calculated at 390m; in the Dilwyn Formation. Swept the hole with a 40 bbl high viscosity pill, with only a slight increase in cuttings at surface. A 50 bbl TORQ-TRIM II / active mud pill was mixed and spotted around the shoe, the casing was worked displacing 14 bbls of spotting fluid at 30 minute intervals. Pumped a total of 70 bbls with no success. Suspecting differential sticking, the annulus was displaced with 250 bbls of 8.5 ppg KCl brine to reduce hydrostatic pressure and the casing worked, again without success. Displaced the annulus back to mud. Casing was cemented at 504m, leaving 135m of 17½" rat hole.

Properties	Programmed		Actual (Typical)		
	Min	Max	Min	Max	Conformance
Mud Weight, ppg	N.C.	9.0	8.8	9.1	Yes
PV (cP) @ 120°F		< 30	10	22	Yes
6 rpm, lb/100 ft²	10	15	4	10	No
API Filtrate		< 15	5	7.4	Yes
KCl Content	3	4	4	4.1	Yes
pH	8.5	9	8.3	8.5	Yes
LGS, % v/v		<10	3.2	4.2	Yes

Explanation of Non-Conformance

- The mud weight was generally maintained at 9.0 ppg or less while drilling. A flowline check while circulating clean after the wiper trip at TD recorded a mud weight of 9.1 ppg, exceeding the 9.0 ppg ceiling as the LGS content increased. A subsequent pit check also recorded a weight of 9.1 ppg. In displacing to KCl brine to attempt to free the casing, 50 bbls of brine were incorporated into the system and this reduced the mud weight to < 9.0 ppg
- The 6 rpm readings were below specification until 575m and even then only increased to 10 - 11, the lower end of the specified range. As discussed with the company representative, 6 rpm values were maintained at 7 - 8 while drilling. Hole cleaning in the vertical hole was never a problem even with the lower 6 rpm value.
- The KCl content fluctuated, due to adsorption by the reactive clays being drilled. Higher KCl concentrations were added to the premix to maintain the specified KCl content.
- The pH was kept low to minimise dispersion of clays, particularly the Narrawaturk Marl.

Maintenance

- A full KCl / EZ-MUD / Polymer system was prepared prior to spudding, incorporating 300 bbls of mud salvaged from the Iona OBS-1 well.
- DEXTRID LT was used as a filtration control agent on the OBS-1 well. However, to minimise potential bacterial degradation, this was replaced with a combination of PAC-L and PAC-R when drilling Iona-4. API filtration was controlled in the range 6 - 8 ml/30 minutes.
- A concentration of 0.5 ppb EZ MUD DP was utilised to effectively encapsulate and inhibit the Narrawaturk Marl.
- The pH was minimised through the Narrawaturk Marl section to prevent dispersion of the reactive clay. pH was then maintained at 8.3 - 8.5 for the remainder of the interval.
- The rheology was kept at the low end of the programmed range to optimise solids removal efficiency and assist in minimising increases in LGS and mud weight.
- 50 bbls of 10 ppb LCM (Kwik Seal) was mixed and on standby should downhole losses occur in the Dilwyn Formation. None occurred and this was pumped as a sweep to flush the hole at interval TD.

Solids Control Equipment

- The DFE linear motion shale shakers were fitted with 3 x 84 mesh screens and operated effectively over this interval.
- Initially the Harrisburg desilter was not operating efficiently. After stripping the unit and cleaning or replacing cones, the desilter worked effectively.
- The DFE centrifuge was run continuously throughout this whole section while drilling or circulating. The centrifuge was run with a wet discharge to increase colloidal solids removal and dilution.

4.2 EVALUATION

Comments

- The usage of PHPA has proved successful in this area in the past and again the Narrawaturk Marl was kept in check with EZ-MUD and KCl in this hole.

Problems, Causes, Remedial Action Taken or Recommended

Hole Conditions

1) Problem Stuck $13^{3}/_{8}$" casing in the Dilwyn Formation.
   Cause Hole misalignment causing mechanical sticking and/or fractured/porous formation resulting in differential sticking; hole misalignment is considered more likely.
   Action Pumped TORQ-TRIM II as a spotting fluid and worked casing. Displaced annulus with 4% KCl brine to reduce hydrostatic pressure and worked pipe, again with no success. Displaced annulus back to mud and cemented casing at 504m.

Drilling Fluid

1) Problem No problems encountered.
   Cause
   Action

Solids Control and Mud Mixing Equipment

1) Problem No problems encountered.
   Cause
   Action

4.3 RECOMMENDATIONS FOR IMPROVEMENT

Hole Conditions

- Hole misalignment due to the bit "walking" when drilling hard stringers is thought to have been the most likely reason for the casing becoming stuck. Using stabilisers to lock up the assembly should eliminate this problem in future
- Differential sticking in the Dilwyn Formation was also considered as a possible cause of the casing becoming stuck, however, this seems unlikely based on experience with previous wells in the area. Should there be evidence of differential sticking on future wells the addition of fine / medium BARACARB bridging agent could be considered.

Drilling Fluid

- The Centrifuge should be run continuously to prevent the build up of low gravity solids. Continue running the centrifuge during trips to reduce mud weight and solids content of the surface volume.

Solids Control and Mud Mixing Equipment.

- Conduct regular maintenance checks to ensure optimum operating efficiency of all solids control equipment.
- A full selection of shaker screens must be maintained on the rig at all times.
- Centrifuge currently takes suction from and returns to the same pit, active pit 2. To optimise centrifuge performance the return mud discharge should be realigned to active pit 3.

5. INTERVAL -2

5.1 SUMMARY

12¼" Hole From 639 m To 1560 m In 15 Days

Drilling Fluid KCl / EZ-MUD / Polymer

Formations Pebble Point Fm, Paaratte Fm, Skull Creek Member, Nullawarre Greensand, Belfast Mudstone, Waare Formation, D unit C1 sand C2 sand B sand.

Operations Summary

Tagged cement at 490m, drilled out from casing and continued drilling contaminated cement to 513m. Circulated bottoms up, treating for minor cement contamination at bottoms up, and ran Leak-Off Test; equivalent mud weight 10.7 ppg. Washed and reamed 513 - 531m, RIH to 629m and washed to 639m. The mud in the rathole was severely contaminated by cement which had apparently channelled down. Due to washing/reaming when running in, this contamination was spread throughout the annulus. At bottoms up the mud was severely clabbered, with a pH in excess of 12.5 affecting polymers which precipitated and came over the shakers in clumps. Such severe contamination was totally unexpected and before the problem was fully appreciated, the mud in the surface pits was also contaminated. After pulling back to the casing shoe, the pits were dumped and cleaned. While continuing to pull out of the hole, 686 barrels of new KCl / EZ-MUD / Polymer fluid was prepared and sheared.

Made up a new directional assembly and RIH to 639m. Pumped a 40 bbl water spacer and displaced the hole to new mud, dumping contaminated returns. Pulled back to the shoe and repeated the Leak-Off Test, this time with an equivalent mud weight of 12.0 ppg. Drilled ahead, rotating and sliding as required after kicking off at 650m and surveying and reaming each connection. Precautionary wiper trips were made at 783m and 935m, with no hole problems encountered. At 1154m, a 40 bbl LCM sweep was pumped, flushing the hole and bringing up a high concentration of cuttings. A Gyro survey was run while pulling back to 485m. Resumed drilling, sliding and rotating as necessary for directional control. Another LCM pill was circulated around prior to tripping at 1382m to pick up the coring assembly.

RIH with coring assembly to 656m, where the string held up. Spent 27 hours reaming back to bottom with the coring assembly. Core #1 was cut from 1381 - 1383m, with 85%. Laid out core barrel and RIH with conventional rotary assembly, drilling ahead to 1448.5m before tripping again to pick up the core barrel.

Further coring runs were made in the Belfast and the top of the Waare formation, requiring only precautionary washing/reaming:

Core #2	1448.5 - 1455m	93% recovery
Core #3	1455 - 1463.3m	91% recovery
Core #4	1463.3 - 1471.5m	77.7% recovery
Core #5	1471.5 - 1478.3m	113% recovery

Resumed rotary drilling, washing and reaming the cored interval before drilling ahead to well TD at 1560m. Pumped a 40 bbl LCM sweep and circulated the well clean, dropped a Magnetic Single Shot and started to pull out of the hole. Worked a tight spot at 1520m after experiencing 30K lbs overpull. Overpull of 50K lbs occurred at 1480m, picked up kelly, worked and wiped tight spot and then pumped out to 1440m. No further tight hole was encountered while pulling out of the hole.

Ran Schlumberger PEX/HALS/DSI combo log, Schlumberger TD 1554m. Attempted to run SAT survey, but this was abandoned due to problems with the gun in the VSP pit.
RIH for a wiper trip, washing/reaming 1467 - 1560m and encountering 9m of fill on bottom. Circulated hole clean. While tripping out, overpull was encountered once again at 1520m. Picked up kelly and worked tight spot before pumping out to 1445m. Pulled out of hole and rigged up to run 9⅝" casing. Casing was successfully run and cemented at 1557m.

Properties	Programmed		Actual (Typical)		
	Min	Max	Min	Max	Conformance
Mud Weight, ppg	-	< 9.6	8.6	9.3	Yes
PV (cP) @ 120°F		< 30	10	13	Yes
6 rpm, lb/100 ft^2	10	15	7	12	No
API Filtrate	6	8	5.4	6.4	Yes
KCl Content	3	4	3.3	3.7	Yes
pH	8.5	9.2	8.3	8.5	No
LGS, % v/v		<10	3.2	4.2	Yes
HPHT Filtrate, 250 F		<15	13.4	18.6	No

Explanation of Non-Conformance

- Initial mud weight was 8.6 ppg. This gradually increased due to incorporation of low gravity solids as drilling progressed, however, at no time did the mud weight exceed specification. Maximum mud weight was 9.3 ppg, immediately after adding the BARACARB bridging agent.
- Generally the mud properties were maintained within the specified limits.
- Hole cleaning in deviated hole was optimised by maintaining a 6 rpm value of 10 - 12 while drilling. The 6 rpm value began to drop away during coring of the Waare sands and this trend continued through to interval TD at 1560m. While coring and drilling the sands there was little or no formation clay being incorporated into the system to supplement the XCD Polymer as a viscosifier. Centrifuging during trips and during coring further reduced the clay content
- API filtration remained steady in the range 6 - 6.5 ml/30 minutes. However, HPHT filtration showed a steadily increasing trend with depth, stabilising in the range 18 - 20 ml/30 minutes. Low gravity solids remained well below the specified upper limit, but still exhibited an increasing trend to stabilise at 5%. These trend lines for HPHT filtrate and LGS are quite similar. Apparently, as LGS content increased, polymer was being consumed in coating the cuttings and this reduced the quantity available for maintenance of HPHT filtration control. Sufficient free polymer was still available for effective API filtrate control.
- A lower pH was maintained to minimise clay solids dispersion.

Maintenance

- Use of KCl / EZ-MUD / Polymer fluid was continued through this interval, with no major changes in formulation.
- XCD Polymer usage was higher than programmed, approximately double. Additional polymer was necessary to maintain the 6 rpm value in the required range.
- Maintaining the KCl content in the required range required a treatment rate almost double that programmed, due to adsorption of the K+ ion by the drilled formation clays.
- Prior to logging and running casing the mud was treated with BARACIDE to prevent bacterial degradation.

Solids Control Equipment

- The DFE linear motion shale shakers again proved effective in removing solids during this section of the hole. A combination of 84 and 110 mesh screens was used initially, but as the newly mixed mud was sheared through the bit the screens were downsized to 3 x 110 mesh (pyramid screens) on each shaker.
- The Harrisburg desilter operated effectively, with all 12 cones functional. Underflow discharge was < 1.5 bbl/minute, ranging from 10.2 - 14 ppg in weight.
- Ran the DFE centrifuge continuously while drilling or circulating, operating with a wet discharge to increase colloidal solids removal. The centrifuge was frequently run during trips to reduce the drill solids content in the surface pits.

5.2 EVALUATION

Comments

- KCl / EZ-MUD / Polymer fluid performed effectively in drilling this interval.
- Problems encountered were unrelated to mud formulation or properties .

Problems, Causes, Remedial Action Taken or Recommended
Hole Conditions

1) Problem: Extensive reaming required on first core barrel run.
   Cause: Running of stiffer core barrel assembly in deviated, near gauge hole.
   Action: Reamed and worked to TD, subsequent trips were troublefree.

2) Problem: Tight hole from 1520 - 1440m when tripping out at TD.
   Cause: Result of thin hard bands in the Waare, loose sands on either side washed out forming ledges.
   Action: Pumped and worked out as required, no problems running $9^5/_8$" casing.

3) Problem: Schlumberger caliper log indicated average hole size of $14^1/_4$".
   Cause: Some hole enlargement due to washout in the sands.
   Action: None taken. $17^1/_2$" rathole section and the fact that it was only a one arm caliper made this problem appear worse.

Drilling Fluid

1) Problem: Cement contaminated mud, requiring mixing of 686 bbls of new KCl / EZ-MUD / Polymer fluid
   Cause: Cement channelled down into the $17^1/_2$" rathole, severely contaminating mud in the rathole. Washing/reaming while running in spread this contamination through the system. This problem was totally unexpected, by the time it was realised the mud from downhole had been circulated back to the surface pits and contaminated those as well.
   Action: Attempted to treat with sodium bicarbonate and citric acid, but contamination too severe, pH > 12.5. Dumped contaminated surface pits, mixed new volume and displaced hole with new mud.

2) Problem: Mud cost significantly higher than programmed.
   Cause: Cost of new volume to replace cement contaminated mud. Consumption of XCD Polymer and KCl higher than programmed.
   Action: XCD Polymer was required to maintain low end rheology, KCl to maintain K+ level due to depletion when adsorbed by clays.

Solids Control and Mud Mixing Equipment

1) Problem High sand content in the mud.
   Cause Shaker screens (84 mesh) too coarse, desilter cones plugged.
   Action Replaced screens with finer mesh and unplugged cones.

5.3 RECOMMENDATIONS FOR IMPROVEMENT

Hole Conditions

- Hole problems in this interval were not mud related. Hole cleaning efficiency was good and there was no obvious formation of cuttings beds.
- Extensive reaming, required when initially running the stiffer core barrel assembly, is not unusual in deviated holes drilled with KCl / EZ MUD / Polymer fluids.
- The nature of the Waare sands, uncemented and highly porous, make it difficult to prevent washout and formation of ledges.

Drilling Fluid

- Generally the KCl / EZ-MUD / Polymer fluid performed well.
- Severe cement contamination of mud in the rathole was totally unexpected. In the event that casing is set high, as in this case, it would be advisable to run to bottom without circulating. Contaminated mud could then be circulated out with minimal effect on the remainder of the mud system. If similar contamination is suspected, circulate bottoms up, then stop while checking the mud for severity of any potential cement contamination. A decision can then be made whether or not to save and treat returns or dump and replace with new mud if severely contaminated.
- Addition of 2 - 5 ppb of prehydrated bentonite would assist in maintaining low end rheology, particularly through the sand sections. Filter cake quality would also be improved, presumably with some decease in HPHT filtration values
- HPHT filtrate values did increase, but the filter cake remained thin and firm. In relation to potential differential sticking, filter cake quality is more important than the actual filtrate value.

Solids Control and Mud Mixing Equipment.

- Solids control and mixing equipment performed effectively.
- The centrifuge proved extremely effective in removing ultra-fine solids and minimising the increase in colloidal sized solids. All future wells in this area should utilise a centrifuge for optimum solids control.

6. INTERVAL - 3

6.1 COMPLETION FLUID SUMMARY

Production Tubing $5^1/_2$" **Run to** **1419 m**

Completion Fluid Inhibited KCl Brine (8.6 ppg)

Operations Summary

After cutting casing and installing the B section, a Schlumberger CBL/VDL/GR run was made and this indicated good isolation across the reservoir. Ran Schlumberger SAT velocity Checkshot survey, while pressure testing and rigging up flare line.

Made a $9^5/_8$" scraper run in to 1570m, working the scraper over the interval 1440 - 1470m. At 1570m the casing was displaced to inhibited brine before pulling out, laying down drill pipe.

Made up Schlumberger 7" gun assembly and completion assembly. RIH with $5^1/_2$" tubing; tubing was closed and had to be filled every 5 stands, the brine displaced from the hole was lost to the sump. Made up test tree and pressure tested, repairing observed leaks. Rigged up wireline lubricator and equipment, retrieved plug. Opened SSD, pumped nitrogen into tubing and displaced 23.5 bbls of bine to the annulus. Attempted, unsuccessfully, to close SSD.

Rigged down lubricator and test tree. Pulled out of hanger, backed out of packer, pulled landing joint and hanger. Reverse circulated tubing volume plus 20%, taking brine returns back to the pits. Pulled out and laid down $5^1/_2$" tubing. Inspected and cleaned tubing and tools, changed out SSD.

Reran $5^1/_2$" tubing, open ended so no need to fill tubing while running in. Ran tubing to 1m above the packer, displaced to nitrogen recovering 23.5 bbls of brine to the trip tank. Stabbed and latched into packer, landed completion.

Pressure tested well as per program. Shut well in and bled off pressure. Set plug in EOT, using wireline. Laid down wireline tool, rigged down lubricator and wireline. Killed well with KCl brine, pumped approximately 230 bbls to finally kill well

Properties	Programmed		Actual (Typical)		
	Min	Max	Min	Max	Conformance
Brine Weight, ppg	8.6	8.6	8.6	8.6	Yes

Explanation of Non-Conformance

- Not applicable.

Maintenance

- It was deemed unnecessary to utilise BARAKLEAN FL as a clean up treatment during the completion operations.
- Mixed KCl, tech grade at 19.5 - 20 ppb, giving a brine weight of 8.6 ppg as requested.
- COAT 2748 was added as a corrosion inhibitor.
- A total of 860 bbls of brine were prepared for the completion. Brine consumption was higher than anticipated due to losses incurred as a result of pulling the tubing and the high volume needed to kill the well.

APPENDIX

DEVIATION DATA

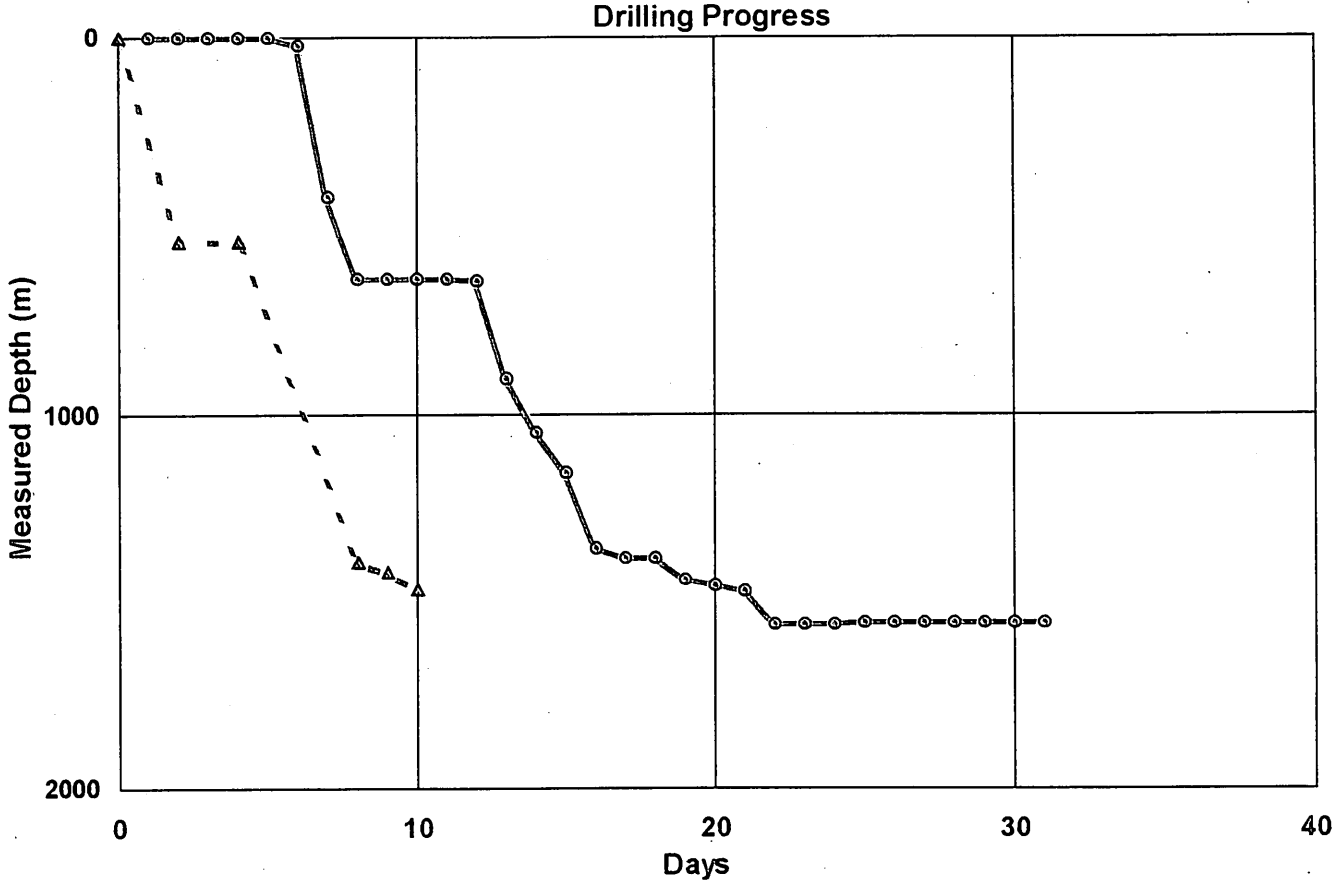
Depth MD (m)	Depth TVD (m)	Inclination (deg)	Direction (deg)	Displacement (m) (Vertical Section)
100.0	100.0	0.07	141.2	-0.1
220.0	220.0	0.14	130.1	-0.2
310.0	310.0	0.07	145.1	-0.3
400.0	400.0	0.09	169.7	-0.3
518.0	518.0	0.21	179.3	-0.3
613.5	613.5	0.27	212.2	-0.2
660.6	660.6	1.5	271.6	0.3
746.1	745.6	9.8	266.2	8.5
803.0	801.1	15.7	262.8	21.0
860.1	855.2	21.7	262.6	39.3
917.1	907.2	26.3	262.4	62.4
974.1	957.5	30.0	261.0	89.3
1031.1	1005.5	35.1	264.1	120.0
1088.1	1050.0	41.8	264.6	155.5
1129.1	1079.8	45.0	263.8	183.7
1181.2	1115.8	47.3	262.5	221.3
1238.2	1154.4	46.9	264.1	263.3
1295.2	1193.5	46.3	262.9	304.7
1361.7	1239.1	48.8	264.3	353.1
1458.7	1303.0	48.8	264.2	426.1
1560.0	1369.7	48.8	264.4	502.3

GRAPHS

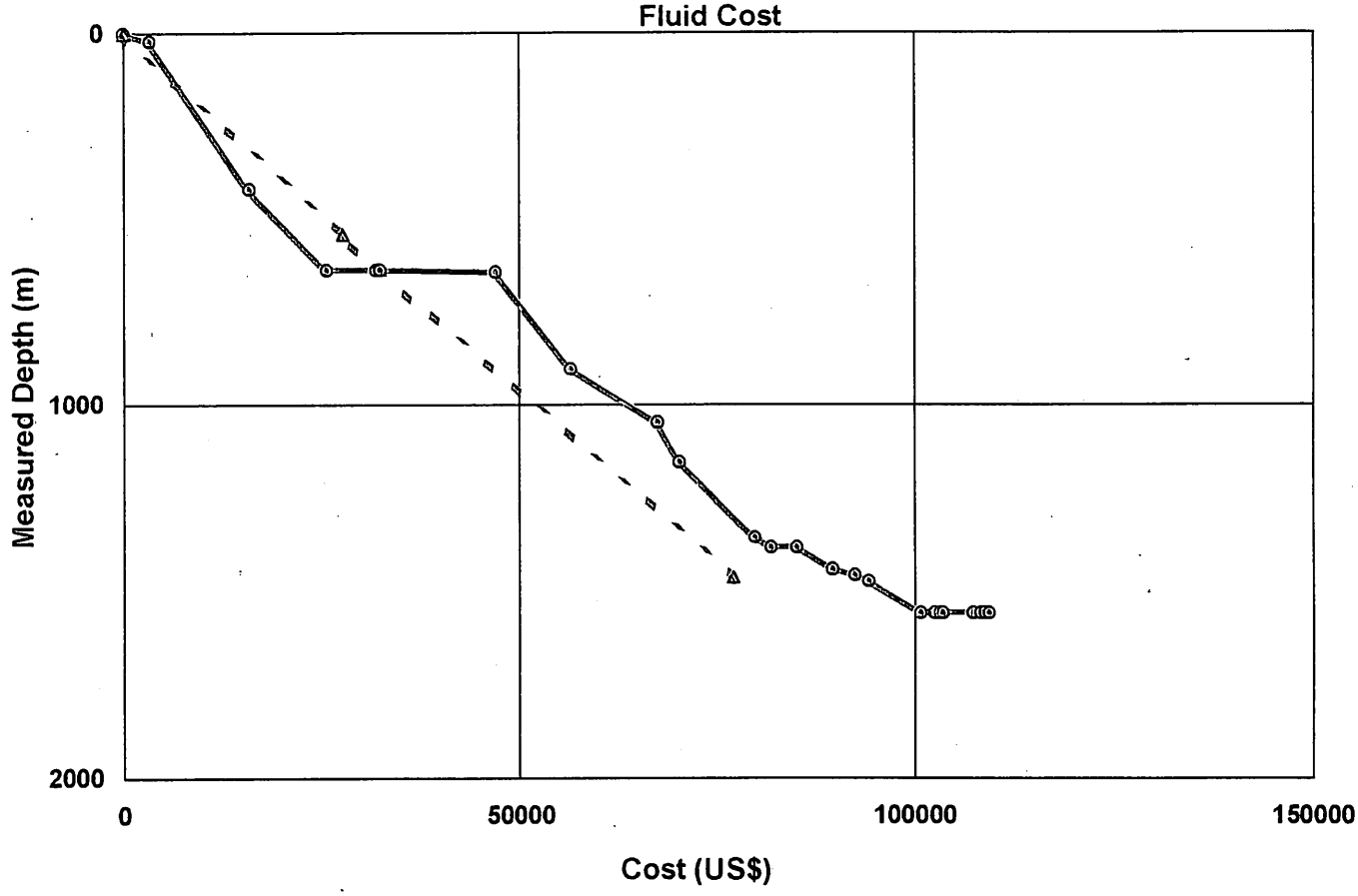
DRILLING FLUID PERFORMANCE

Operator : Western Underground Gas
Well : IONA-4

Drilling Progress

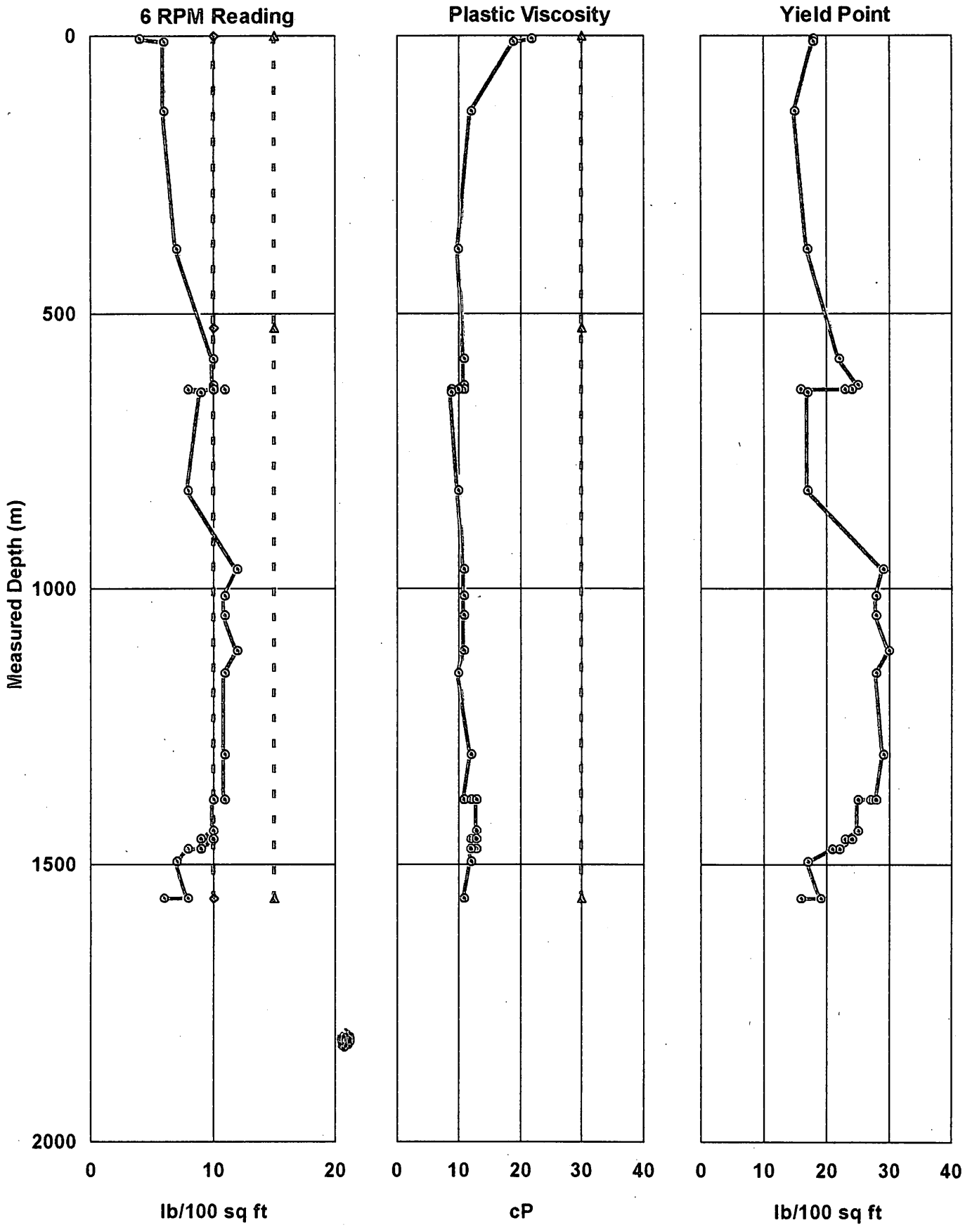


Fluid Cost



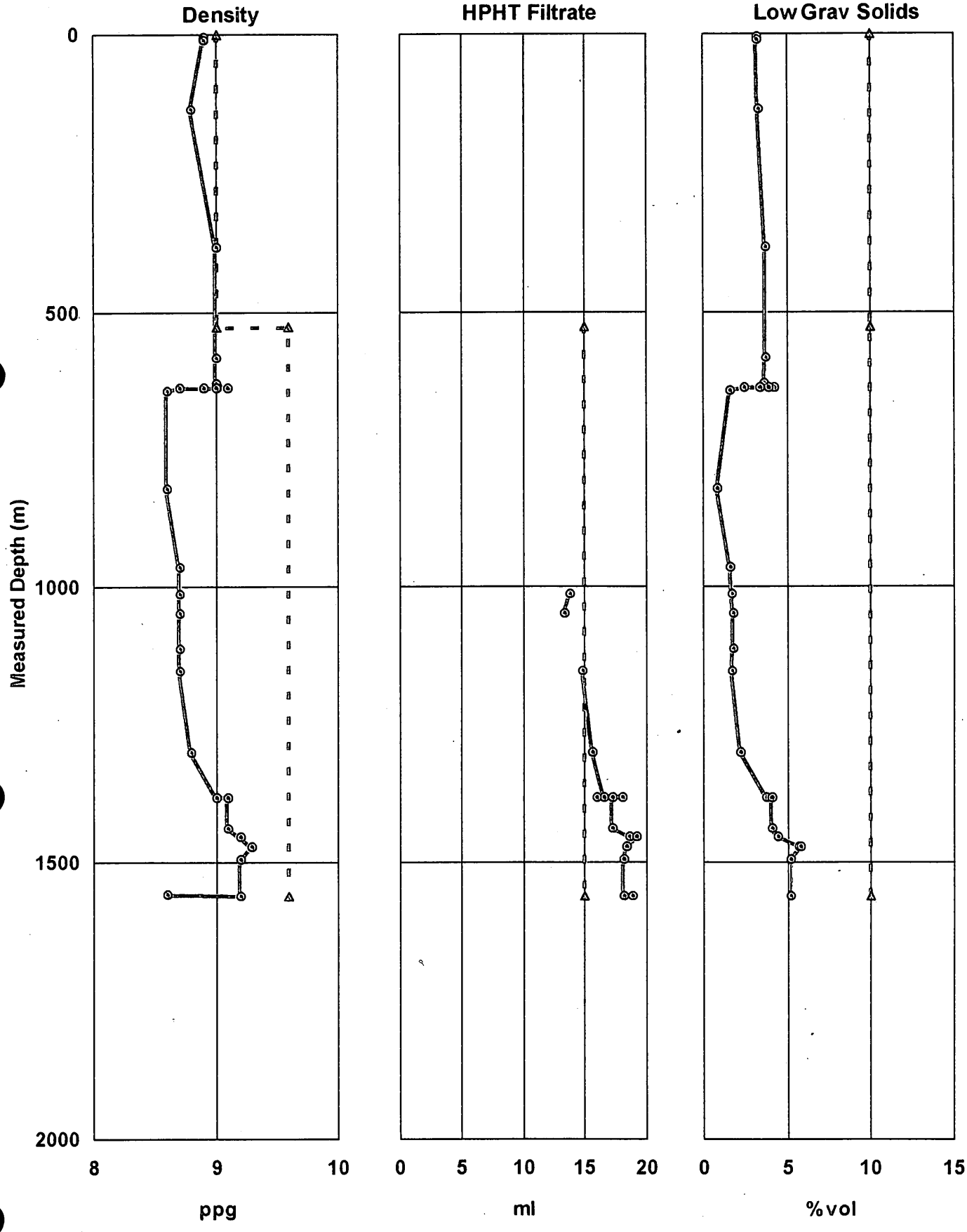
DRILLING FLUID PROPERTIES (Page - 1)

Operator : Western Underground Gas
Well : IONA-4



DRILLING FLUID PROPERTIES (Page - 2)

Operator : Western Underground Gas
Well : IONA-4



POST WELL AUDIT

Postwell Audit

Western Underground Gas Storage Pty. Ltd

IONA-4

Drilling Contractor	O.D.& E.
Rig	30
Prepared by	ALAN SEARLE/GERALD LANGE
Date	09/04/99
Internal Well Number	M0300329

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Contents

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Well Summary

Well data	Spud date	: 06/03/99
	TD date	: 25/03/99
	Days on well	: 26
	Drilling days	: 12
	Total measured depth	: 1,560 meters
	True vertical depth	: 1,370 meters
	Distance Drilled	: 1,557 meters
	Maximum deviation	: 48.80°
	BHT	: 62 Deg C
	Total mud cost	: $A 109,304.47
	Mud cost per meters	: $A 70.19
	Total cost	: $A 109,304.47
	Baroid Engineers	: GERALD LANGE : ALAN SEARLE

Casing Program	Casing size in.	Shoe depth meters
	20	5
	13 3/8	504
	9 5/8	1,558

Mud type	Interval meters	Hole size in.	Mud cost, $A
KCL/EZ MUD/POLYMER	5 To 639	17.5	32,433.77
KCL/EZ MUD/POLYMER	639 To 1560	12.25"	70,960.81
KCL BRINE	1558 To 1560		5,909.89

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Total Material Consumption

Material	Unit size	Quantity	Total cost ($A)
AQUAGEL	25 KG. BAG	79	1,424.37
BARACARB 100	25 KG. BAG	174	2,068.86
BARACARB 25	25 KG. BAG	176	1,874.40
BARACIDE	25 KG. CAN	6	1,088.64
BARACOR 129	25 KG. CAN	17	1,104.66
barite	25 KG. SACK	455	3,257.80
citric acid	25 KG. BAG	20	1,241.00
Coat-2748	208 L. DRUM	2	1,700.00
EZ-MUD DP	25 KG. BAG	33	5,789.52
KCL - Tech.	25 KG. SACK	308	4,321.24
Kwikseal Fine	40 LB. BAG	20	884.60
Kwikseal Medium	40 LB. BAG	20	874.20
PAC-L	25 KG. BAG	44	8,352.52
PAC-R	25 KG. BAG	26	4,935.58
potassium chloride	25 KG. BAG	1,210	15,730.00
potassium hydroxide	20 KG. PAIL	40	1,758.00
soda ash	25 KG. BAG	6	90.00
sodium bicarbonate	25 KG. BAG	7	120.12
TORQ-TRIM	55 GAL. DRUM	4	3,049.16
XCD Polymer	55 LB. BAG	105	49,639.80

Total mud cost $A 109,304.47

Programmed mud cost $A 77,094.42

Variance $A 32,210.05

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Interval Summary

Interval # 01

Bit Size	17.5 in.
Maximum hole diameter	17.5 in.
Mud type(s)	KCL/EZ MUD/POLYMER
Top of interval	5.0 meters
Bottom of interval	639.0 meters
Maximum density	9.10 ppg
Interval start date	01/03/99
Interval end date	10/03/99
Interval days	10
Drilling days	3
Interval TD date	08/03/99
Rotating hours	36.50
Average penetration rate	17.4 meters
Maximum flowline temperature	41° Deg C
Casing size	13 3/8 in.
Interval mud cost	$A 32,433.77
Mud cost per meters	$A 51.16
Total Interval Cost	$A 32,433.77

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Interval Summary

Interval # 02

Bit Size	12.25" in.
Maximum hole diameter	17.5 in.
Mud type(s)	KCL/EZ MUD/POLYMER
Top of interval	639.0 meters
Bottom of interval	1,560.0 meters
Maximum density	9.30 ppg
Interval start date	11/03/99
Interval end date	25/03/99
Interval days	15
Drilling days	9
Interval TD date	22/03/99
Rotating hours	102.00
Average penetration rate	9.0 meters
Maximum flowline temperature	52° Deg C
Casing size	9 5/8 in.
Maximum deviation	48.80°
Interval mud cost	$A 70,960.81
Mud cost per meters	$A 77.05
Total Interval Cost	$A 70,960.81

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Interval Summary

Interval # 03

Bit Size	in.
Mud type(s)	KCL BRINE
Top of interval	1,558.0 meters
Bottom of interval	1,560.0 meters
Maximum density	8.60 ppg
Interval start date	26/03/99
Interval end date	31/03/99
Interval days	6
Maximum flowline temperature	0° Deg C
Casing size	9 5/8 in.
Maximum deviation	48.80°
Interval mud cost	$A 5,909.89
Mud cost per meters	$A 2,937.79
Total Interval Cost	$A 5,909.89

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Interval Material Consumption

Interval #01 17.5 in. Hole Section

Top of Interval 5 meters
Bottom of Interval 639 meters

Material	Unit size	Quantity	Total cost ($A)
AQUAGEL	25 KG. BAG	79	1,424.37
BARACIDE	25 KG. CAN	2	362.88
barite	25 KG. SACK	68	486.88
EZ-MUD DP	25 KG. BAG	16	2,807.04
KCL - Tech.	25 KG. SACK	45	631.35
Kwikseal Fine	40 LB. BAG	10	442.30
PAC-R	25 KG. BAG	3	569.49
potassium chloride	25 KG. BAG	450	5,850.00
potassium hydroxide	20 KG. PAIL	6	263.70
TORQ-TRIM	55 GAL. DRUM	4	3,049.16
XCD Polymer	55 LB. BAG	35	16,546.60

Interval mud cost	$A 32,433.77
Programmed mud cost	$A 27,518.91
Variance	$A 4,914.86

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Interval Material Consumption

Interval #02 12.25" in. Hole Section

Top of Interval 639 meters
Bottom of Interval 1,560 meters

Material	Unit size	Quantity	Total cost ($A)
BARACARB 100	25 KG. BAG	174	2,068.86
BARACARB 25	25 KG. BAG	176	1,874.40
BARACIDE	25 KG. CAN	4	725.76
BARACOR 129	25 KG. CAN	17	1,104.66
barite	25 KG. SACK	387	2,770.92
citric acid	25 KG. BAG	20	1,241.00
EZ-MUD DP	25 KG. BAG	17	2,982.48
Kwikseal Fine	40 LB. BAG	10	442.30
Kwikseal Medium	40 LB. BAG	20	874.20
PAC-L	25 KG. BAG	44	8,352.52
PAC-R	25 KG. BAG	23	4,366.09
potassium chloride	25 KG. BAG	720	9,360.00
potassium hydroxide	20 KG. PAIL	34	1,494.30
soda ash	25 KG. BAG	6	90.00
sodium bicarbonate	25 KG. BAG	7	120.12
XCD Polymer	55 LB. BAG	70	33,093.20

Interval mud cost	$A 70,960.81
Programmed mud cost	$A 49,575.51
Variance	$A 21,385.30

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Interval Material Consumption

Interval #03 in. Hole Section

Top of Interval	1,558	meters
Bottom of Interval	1,560	meters

Material	Unit size	Quantity	Total cost ($A)
Coat-2748	208 L. DRUM	2	1,700.00
KCL - Tech.	25 KG. SACK	263	3,689.89
potassium chloride	25 KG. BAG	40	520.00

Interval mud cost	$A 5,909.89
Programmed mud cost	$A 8,344.11
Variance	$A -2,434.22

Company:	Western Underground Gas Storage Pty. Ltd	**Country:**	AUSTRALIA
Well Name:	IONA-4	**Geo Area:**	OTWAY BASIN
Contractor:	O.D.& E.	**Field:**	PPL 2
Rig:	30	**Region:**	Victoria

Daily Mud Volume Record

HOLE SIZE:17.5 in.

MUD TYPE:KCL/EZ MUD/POLYMER

DATE	INITIAL VOLUME bbl	MUD RECEIVED bbl	OIL ADDED bbl	WATER ADDED bbl	BARITE ADDED bbl	CHEMICALS ADDED bbl	DAILY TOTAL bbl	CUMLATIVE TOTAL bbl	MUD LOST SURFACE bbl	MUD LOST DOWNHOLE bbl	TOTAL DAILY LOSSES bbl	CUMLATIVE LOSSES bbl	MUD RETURNED bbl	FINAL VOLUME bbl	HOLE VOLUME bbl	ACTIVE PITS bbl	RESERVE PITS bbl
01/03/99	0	450	0	0	0	0	450	450	0	0	0	0	0	450	0	0	450
02/03/99	450	0	0	0	0	0	0	450	0	0	0	0	0	450	0	0	450
03/03/99	450	0	0	0	0	0	0	450	0	0	0	0	0	450	0	0	450
04/03/99	450	0	0	0	0	0	0	450	0	0	0	0	0	450	0	0	450
05/03/99	450	0	0	0	0	0	0	450	150	0	150	150	0	300	0	0	300
06/03/99	300	0	0	300	0	4	304	754	53	0	53	203	0	551	19	382	150
07/03/99	551	0	0	800	0	14	814	1,568	476	0	476	679	0	889	392	332	165
08/03/99	889	0	0	450	3	9	462	2,030	413	0	413	1,092	0	938	594	344	0
09/03/99	938	0	0	50	0	9	59	2,089	28	0	28	1,120	0	969	625	344	0
10/03/99	969	0	0	50	0	0	50	2,139	0	0	0	1,120	0	1,019	387	482	150

Company:	Western Underground Gas Storage Pty. Ltd	**Country:**	AUSTRALIA
Well Name:	IONA-4	**Geo Area:**	OTWAY BASIN
Contractor:	O.D.& E.	**Field:**	PPL 2
Rig:	30	**Region:**	Victoria

Daily Mud Volume Record

HOLE SIZE:12.25" in.

MUD TYPE:KCL/EZ MUD/POLYMER

DATE	INITIAL VOLUME bbl	MUD RECEIVED bbl	OIL ADDED bbl	WATER ADDED bbl	BARITE ADDED bbl	CHEMICALS ADDED bbl	DAILY TOTAL bbl	CUMLATIVE TOTAL bbl	MUD LOST SURFACE bbl	MUD LOST DOWNHOLE bbl	TOTAL DAILY LOSSES bbl	CUMLATIVE LOSSES bbl	MUD RETURNED bbl	FINAL VOLUME bbl	HOLE VOLUME bbl	ACTIVE PITS bbl	RESERVE PITS bbl
11/03/99	1,019	0	0	0	0	0	0	0	0	0	0	0	0	1,019	387	482	150
12/03/99	1,019	0	0	686	0	14	700	700	856	0	856	856	0	863	365	498	0
13/03/99	863	0	0	246	0	4	250	950	281	0	281	1,137	0	832	477	315	40
14/03/99	832	0	0	391	0	9	400	1,350	169	0	169	1,306	0	1,063	638	485	40
15/03/99	1,063	0	0	97	2	3	102	1,452	52	0	52	1,358	0	1,113	583	530	0
16/03/99	1,113	0	0	390	0	10	400	1,852	384	0	384	1,742	0	1,129	669	410	50
17/03/99	1,129	0	0	90	0	5	95	1,947	93	0	93	1,835	0	1,131	712	319	100
18/03/99	1,131	0	0	90	0	6	96	2,043	133	0	133	1,968	0	1,094	702	323	69
19/03/99	1,094	0	0	190	0	8	198	2,239	86	0	86	2,054	0	1,194	730	359	105
20/03/99	1,194	0	0	95	0	6	101	2,340	52	0	52	2,116	0	1,243	735	376	132
21/03/99	1,243	0	0	0	2	7	9	2,349	95	0	95	2,211	0	1,157	743	344	70
22/03/99	1,157	0	0	95	0	13	108	2,457	52	0	52	2,263	0	1,213	784	402	27
23/03/99	1,213	0	0	0	0	0	0	2,457	123	0	123	2,386	0	1,090	787	276	27
24/03/99	1,090	0	0	0	0	0	0	2,457	96	20	116	2,502	0	974	764	210	0
25/03/99	974	0	0	388	0	0	388	2,845	975	0	975	3,477	0	388	388	0	0

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Company:	Western Underground Gas Storage Pty. Ltd	**Country:**	AUSTRALIA
Well Name:	IONA-4	**Geo Area:**	OTWAY BASIN
Contractor:	O.D.& E.	**Field:**	PPL 2
Rig:	30	**Region:**	Victoria

Daily Mud Volume Record

MUD TYPE:KCL BRINE

HOLE SIZE:in.

DATE	INITIAL VOLUME bbl	MUD RECEIVED bbl	OIL ADDED bbl	WATER ADDED bbl	BARITE ADDED bbl	CHEMICALS ADDED bbl	DAILY TOTAL bbl	CUMLATIVE TOTAL bbl	MUD LOST SURFACE bbl	MUD LOST DOWNHOLE bbl	TOTAL DAILY LOSSES bbl	CUMLATIVE LOSSES bbl	MUD RETURNED bbl	FINAL VOLUME bbl	HOLE VOLUME bbl	ACTIVE PITS bbl	RESERVE PITS bbl
26/03/99	388	0	0	460	0	12	462	462	422	0	422	422	0	428	388	40	0
27/03/99	428	0	0	170	0	0	170	632	150	0	150	572	0	448	388	60	0
28/03/99	448	0	0	113	0	2	115	747	0	0	0	572	0	563	388	175	0
29/03/99	563	0	0	110	0	2	112	859	7	0	7	579	0	668	388	280	0
30/03/99	668	0	0	0	0	0	0	859	0	0	0	579	0	668	388	280	0
31/03/99	668	0	0	0	0	0	0	859	281	0	281	860	0	388	388	0	0

Company:	Western Underground Gas Storage Pty. Ltd	**Country:**	AUSTRALIA
Well Name:	IONA-4	**Geo Area:**	OTWAY BASIN
Contractor:	O.D.& E.	**Field:**	PPL 2
Rig:	30	**Region:**	Victoria

Mud Program Exceptions Report

DATE	TIME	DEPTH meters	PROPERTY	UNITS	EXCEPTION	PROGRAM MINIMUM	PROGRAM MAXIMUM	ACTUAL	PROBLEM
03/06/99	22:30	15	6 rpm		LOW	10.0		8.0	
	21:50	10	6 rpm		LOW	10.0		6.0	
	15:00	5	6 rpm		LOW	10.0		4.0	
03/07/99	22:00	383	6 rpm		LOW	10.0		7.0	
	20:42	383	MUD WEIGHT	ppg	HIGH		9.0	9.1	
		383	6 rpm		LOW	10.0		8.0	
	09:00	136	6 rpm		LOW	10.0		6.0	
03/08/99	23:30	639	PH		LOW	8.5	9.2	8.3	
	13:30	631	PH		LOW	8.5	9.2	8.3	
03/09/99	09:30	639	PH		LOW	8.5	9.2	8.3	
	17:00	639	PH		LOW	8.5	9.2	8.2	
03/10/99	16:00	639	PH		LOW	8.5	9.2	8.1	
		639	6 rpm		LOW	10.0	15.0	8.0	
03/11/99	16:00	639	PH		LOW	8.5	9.2	8.1	
		639	6 rpm		LOW	10.0	15.0	8.0	
03/12/99	23:00	644	API FILTRATE	ml/30 min	HIGH	6.0	8.0	9.2	
		644	PH		LOW	8.5	9.2	8.2	
		644	6 rpm		LOW	10.0	15.0	9.0	
	06:30	639	API FILTRATE	ml/30 min	HIGH	6.0	8.0	14.0	
		639	PH		HIGH	8.5	9.2	12.5	
		639	6 rpm		LOW	10.0	15.0	8.0	
	00:30	639	6 rpm		LOW	10.0	15.0	8.0	
03/13/99	16:45	822	6 rpm		LOW	10.0	15.0	8.0	
	10:45	775	6 rpm		LOW	10.0	15.0	8.0	
03/14/99	10:30	964	PH		LOW	8.5	9.2	8.4	

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Mud Program Exceptions Report

DATE	TIME	DEPTH meters	PROPERTY	UNITS	EXCEPTION	PROGRAM MINIMUM	PROGRAM MAXIMUM	ACTUAL	PROBLEM
03/17/99	23:45	1382	API FILTRATE	ml/30 min	LOW	6.0	8.0	5.8	
		1382	PH		LOW	8.5	9.2	8.3	
	09:45	1382	PH		LOW	8.5	9.2	8.4	
03/18/99	24:00	1382	API FILTRATE	ml/30 min	LOW	6.0	8.0	5.9	
	13:00	1382	API FILTRATE	ml/30 min	LOW	6.0	8.0	5.6	
		1382	PH		LOW	8.5	9.2	8.3	
03/19/99	14:00	1383	API FILTRATE	ml/30 min	LOW	6.0	8.0	5.4	
03/20/99	13:30	1455	API FILTRATE	ml/30 min	LOW	6.0	8.0	5.7	
03/21/99	23:50	1472	MUD WEIGHT	ppg	HIGH		9.2	9.3	
		1472	6 rpm		LOW	10.0	15.0	8.0	
	14:00	1472	MUD WEIGHT	ppg	HIGH		9.2	9.3	
		1472	6 rpm		LOW	10.0	15.0	9.0	
03/22/99	23:55	1560	API FILTRATE	ml/30 min	LOW	6.0	8.0	5.7	
		1560	6 rpm		LOW	10.0	15.0	8.0	
	15:00	1495	6 rpm		LOW	10.0	15.0	7.0	
03/23/99	23:50	1560	6 rpm		LOW	10.0	15.0	6.0	
03/24/99	01:30	1560	6 rpm		LOW	10.0	15.0	6.0	
03/26/99	12:00	1558	API FILTRATE	ml/30 min	LOW	6.0	8.0		
		1558	PH		LOW	8.5	9.2		
03/27/99	23:45	1558	API FILTRATE	ml/30 min	LOW	6.0	8.0		
		1558	PH		LOW	8.5	9.2		
03/28/99	23:50	1558	API FILTRATE	ml/30 min	LOW	6.0	8.0		
		1558	PH		LOW	8.5	9.2		
03/29/99	21:00	1558	API FILTRATE	ml/30 min	LOW	6.0	8.0		
		1558	PH		LOW	8.5	9.2		

Company:	Western Underground Gas Storage Pty. Ltd	**Country:**	AUSTRALIA
Well Name:	IONA-4	**Geo Area:**	OTWAY BASIN
Contractor:	O.D.& E.	**Field:**	PPL 2
Rig:	30	**Region:**	Victoria

Mud Program Exceptions Report

DATE	TIME	DEPTH meters	PROPERTY	UNITS	EXCEPTION	PROGRAM MINIMUM	PROGRAM MAXIMUM	ACTUAL	PROBLEM
03/30/99	23:00	1558	API FILTRATE	ml/30 min	LOW	6.0	8.0		
		1558	PH		LOW	8.5	9.2		
03/31/99	23:04	1558	API FILTRATE	ml/30 min	LOW	6.0	8.0		
		1558	PH		LOW	8.5	9.2		

Company: Western Underground Gas Storage Pty. Ltd
Well Name: IONA-4
Contractor: O.D.& E.
Rig: 30

Country: AUSTRALIA
Geo Area: OTWAY BASIN
Field: PPL 2
Region: Victoria

Mud Property Recap:Water-Based Mud

DATE	DEPTH	F/L TEMP	DENSITY	FUN VIS	RHEOLOGY @ 120°F			pH	FILTRATION				FILTRATE ANALYSIS					SAND	RETORT ANALYSIS				MBT	RHEOMETER DIAL READINGS		
					PV	YP	GELS		API	HTHP	Cake	Temp	Pm	Pf	Mf	Cl	Total Hardness		Corr Solids	LGS	Oil	Water				
	meters	Deg C	ppg	sec/qt	cP	lbs/100 ft2			ml/30 ml	ml/30 min	32nd in	Deg C	ml	ml	ml	mg/L	mg/L	% by vol	% by vol	% by vol	% by vol	% by vol	me/ml mud	600/300	200/100	6/3
01/03/99			0.0	28	1.0		/					121												/	/	/
02/03/99			0.0	28	1.0		/				2/0	121												/	/	/
03/03/99			0.0	28	1.0		/					121												/	/	/
04/03/99			0.0	28	1.0		/				2/0	121												/	/	/
05/03/99			0.0	28	1.0		/					121												/	/	/
06/03/99	23	27	8.9	64	20.0	18.0	4.0/ 7.0	8.50	6.5		2/0	121	0.30	0.15	0.50	22,000	120.0	0.75	3.23	3.23		95.50	12.00	58 / 38	29 / 17	8 / 4
07/03/99	421	29	9.0	45	10.0	17.0	7.0/ 11.0	8.00	7.5		1/0	121	0.25	0.05	0.35	22,000	120.0	1	3.74	3.74		95.00	12.50	37 / 27	23 / 17	7 / 5
08/03/99	639	38	9.1	46	11.0	23.0	10.0/ 17.0	8.30	7.4		1/0	121	0.35	0.05	0.35	21,000	100.0	1	4.30	4.22		94.50	11.00	45 / 34	30 / 24	10 / 8
09/03/99	639		9.1	47	11.0	24.0	10.0/ 17.0	8.30	7.4		1/0	121	0.35	0.05	0.35	21,000	100.0	1	4.30	4.22		94.50	11.00	46 / 35	30 / 24	10 / 8
10/03/99	639		8.9	45	9.0	16.0	7.0/ 12.0	8.10	7.6		1/0	121	0.20	0.02	0.40	18,500	80.0	0.3	3.43	3.43		95.50	7.50	34 / 25	21 / 17	8 / 6
11/03/99	639		8.9	45	9.0	16.0	7.0/ 12.0	8.10	7.6		1/0	121	0.20	0.02	0.40	18,500	80.0	0.3	3.43	3.43		95.50	7.50	34 / 25	21 / 17	8 / 6
12/03/99	644	27	8.8	56	9.0	17.0	6.0/ 8.0	8.20	9.2		1/0	121	0.05	0.01	0.35	24,000	120.0	tr	1.59	1.59		97.00		36 / 26	22 / 16	9 / 6
13/03/99	906	41	8.7	51	12.0	24.0	10.0/ 12.0	8.60	6.6		1/0	121	0.25	0.08	0.35	22,000	180.0	1.5	1.71	1.71		97.00	7.50	48 / 36	31 / 24	10 / 8
14/03/99	1049	42	8.7	53	11.0	28.0	11.0/ 16.0	8.50	6.6	13.40	1/2	121	0.20	0.08	0.40	21,000	200.0	0.5	1.77	1.77		97.00	5.00	50 / 39	34 / 26	11 / 9
15/03/99	1154		8.7	50	10.0	28.0	11.0/ 17.0	8.50	6.4	14.80	1/2	121	0.20	0.08	0.55	22,000	180.0	0.25	1.71	1.71		97.00	5.00	48 / 38	32 / 26	11 / 9
16/03/99	1350	51	8.9	50	12.0	30.0	11.0/ 19.0	8.50	6.4	15.80	1/2	121	0.20	0.10	0.70	22,000	200.0	0.5	3.23	3.23		95.50	7.50	54 / 42	36 / 29	12 / 9
17/03/99	1382	41	9.0	51	11.0	27.0	10.0/ 18.0	8.30	5.8	16.00	1/2	121	0.20	0.04	0.87	22,000	190.0	0.3	3.74	3.74		95.00	7.50	49 / 38	32 / 25	10 / 8
18/03/99	1382	40	9.1	55	13.0	28.0	10.0/ 18.0	8.60	5.9	17.20	1/2	121	0.15	0.08	0.73	23,000	232.0	0.75	4.18	4.12		94.50	8.00	54 / 41	35 / 28	11 / 9
19/03/99	1439	49	9.1	52	13.0	25.0	9.0/ 17.0	8.50	6.2	17.20	1/2	100	0.08	0.08	0.78	23,000	200.0	0.5	4.18	4.12		94.50	8.00	51 / 38	32 / 25	10 / 8
20/03/99	1456	40	9.2	52	13.0	24.0	9.0/ 200.0	8.50	6.1	19.20	1/2	100	0.10	0.12	0.78	22,000	212.0	0.5	4.75	4.43		94.00	10.00	50 / 37	32 / 24	10 / 8
21/03/99	1472		9.3	49	12.0	21.0	8.0/ 19.0	8.50	6.2	18.40	1/2	100	0.10	0.90	0.72	22,000	180.0	1.25	5.76	5.76		93.00	11.00	45 / 31	28 / 20	8 / 6
22/03/99	1560	49	9.2	49	11.0	19.0	7.0/ 22.0	8.50	5.7	18.20	1/2	100	0.08	0.07	0.88	23,500	220.0	0.5	5.17	5.17		93.50	11.00	41 / 30	25 / 19	8 / 7
23/03/99	1560	39	9.2	46	11.0	16.0	6.0/ 18.0	8.60	6.2	18.80	1/2	100		0.08	1.00	23,500	180.0	0.75	5.17	5.17		93.50	12.00	38 / 27	23 / 17	6 / 5
24/03/99	1560	39	9.2	46	11.0	16.0	6.0/ 18.0	8.50	6.2		1/0	100	0.10	0.08	0.98	23,500	180.0	0.75	5.17	5.17		93.50	12.00	38 / 27	23 / 17	6 / 5

Company:	Western Underground Gas Storage Pty. Ltd	**Country:**	AUSTRALIA
Well Name:	IONA-4	**Geo Area:**	OTWAY BASIN
Contractor:	O.D.& E.	**Field:**	PPL 2
Rig:	30	**Region:**	Victoria

Mud Property Recap:Water-Based Mud

DATE	DEPTH	F/L TEMP	DENSITY	FUN VIS	RHEOLOGY @ 120°F			pH	FILTRATION				FILTRATE ANALYSIS					SAND	RETORT ANALYSIS				MBT	RHEOMETER DIAL READINGS		
					PV	YP	GELS		API	HTHP	Cake	Temp	Pm	Pf	Mf	Cl	Total Hardness		Corr Solids	LGS	Oil	Water				
	meters	Deg C	ppg	sec/qt	cP	lbs/100 ft2			ml/30 ml	ml/30 min	32nd In	Deg C	ml	ml	ml	mg/L	mg/L	% by vol	% by vol	% by vol	% by vol	% by vol	me/ml mud	600/300	200/100	6/3
25/03/99	1558		0.0		1.0		/				2/ 0	100												/	/	/
26/03/99	1558		8.6	28	1.0		/					100				25,000								/	/	/
27/03/99	1558		8.6	28	1.0		/				2/ 0	100				25,000								/	/	/
28/03/99	1558		8.6	28	1.0		/					100				25,000								/	/	/
29/03/99	1558		8.6	28	1.0		/					100				25,000								/	/	/
30/03/99	1558		8.6	28	1.0		/				2/ 0	100				24,500								/	/	/
31/03/99	1558		0.0		1.0		/					100												/	/	/

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Daily Operations Log

DATE	DEPTH meters	OPERATION
01/03/99	0	**MOVING RIG** Moving rig to next location.
02/03/99	0	**MOVING RIG** Moving rig to next location.
03/03/99	0	**MOVING RIG** Moving rig to next location.
04/03/99	0	**MOVING RIG** Move rig on location.
05/03/99	0	**MOVING RIG** Rigging up rig.

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Daily Operations Log

DATE	DEPTH meters	OPERATION
06/03/99	23	DRILLING

Received 300 bbls of KCL/polymer mud from OBS-1 well. Reduced viscosity with premix. Mixed 300 bbls of premix. Added XCD polymer to increase 6 RPM reading. Used high vis mud from OBS-1 well to mix 50 bbls of 10 ppb Kwik Seal Fine LCM pill. (10 sx).

Drill Rat hole and Mouse hole with mud. Spud well at 21:30 hrs on the 6/3/99. Control drilling kelly down picking up drill collars. Changed screens to 84 mesh on shaker #1 no larger screens available.

07/03/99	421	DRILLING

Mixed 800 bbls of KCL/polymer premix, transferred to active for volume and dilution. Maintaining 0.5 ppb of EZ Mud in the system. Drilled the Gellibrand Marl section with no gumbo clay problems. 6 RPM reading kept at 7-8 as discussed with WUGS representatives.

Drilling, ran survey at 195 m, 0.25 deg and ì at 360 m, 0.4 deg.

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Daily Operations Log

DATE	DEPTH meters	OPERATION
08/03/99	639	CIRCULATING

Mixed 450 bbls of KCL/polymer premix, ì transferred to active for volume and ì dilution. Swept hole at TD with 40 bbls high viscosity ì pill with 10 ppb of Kwik seal fine. Kwik seal fine, 10 sx not charged. No price ì on each sx.

Drilled to 631 m, circulate for sample, drill to 639 m TD, circulate out, pump and swept the hole with 40 bbls hi-vis pill. Light increase in cuttings when sweep to surface. Slug pipe, made wiper trip. Circulate out, high increase in cuttings over shakers on bottoms up, circ. until hole clean.

09/03/99 639 **WORKING STUCK CSG**

Run 13-3/8" csg, stuck at 504 m, Pump 50 ì bbls of 165 sec/qt hi-vis sweep, very light ì cuttings to surface. Mixed and spotted 50 ì bbls Torq Trim pill on bottom of csg, no ì success to release csg. Mixing 300 bbls of ì 3.5 % KCL fluid to displace well. 54 sx of Aquagel used for cement water, ì charged to the mud. Charged 10 sx of Kwik ì Seal Fine used on the 6/3/99. Mixed cement water in mud pits, when ì transferring cement water to Halliburton ì tank, 50 bbls leaked to the mud system ì through the mud pump suction valve on ì centrifical pump.

Stuck casing at 504 m. Circulate and worked ì casing. Swept hole with 50 bbls of XCD ì Polymer hi-vis mud. Spot 50 bbls of Torq ì Trim II stuck pipe fluid at the shoe, worked ì pipe and pumped 210 strokes each 30 minutes, ì total pumped 1050 strokes, no success. Mixing 300 bbls of 3.5 % KCL brine to ì displace the annulus.

10/03/99 639 **NIPPLING UP BOP'S**

Mixed 300 bbls of 3% KCL brine, displaced the annulus with 250 bbls of KCL brine, worked pipe, no success. Displaced the annulus with KCL/polymer mud. Piked up 50 bbls of KCL water in the system.

27 sx of Aquagel used for cement water, charged to the mud.

Displaced annulus with 3% KCL fluid, worked pipe, no success, displaced back to mud. Mixed cement water, cement casing in place at 504 m. Nippling up BOP.

Casing stretch free point, calculated at 390 m Barite on location 1084 sx.

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Daily Operations Log

DATE	DEPTH meters	OPERATION
11/03/99	639	**RUNNING IN HOLE** Prepare to drill cement. Barite on location 1084 sx. Nipple up and test BOP's, Running in hole.
12/03/99	644	**DRILLING** RIH to top of cement at 490 m. Drill out the shoe track, bottoms up at 490 m, mud contaminated with cement, conditioned with Bicarb and Citric acid. Drilled out casing shoe circulate and ran LOT. RIH to 639 m, circulate, mud in rat hole contaminated with cement, pH 12.5. PHPA came over the shakers in clumps. Lost mud over shakers and dumped severe contaminated mud. Treat system with Citric acid, Bicarb and water with minimal results. Mixed slug POOH. While POOH, dumped and clean mud pits, salvaged 200 bbls of KCL/Polymer mud in reserve. Mixed 600 bbls of 4% KCL/polymer mud, sheared mud with rig pump for 9 Hrs. RIH with a directional drilling assembly to 639 m, pumped 40 bbls water spacer and displaced hole with freshly built KCL polymer mud. POOH to csg shoe at 504 m, ran LOT, results 12.0 ppg EMW. RIH Drilling. Mixed 50 bbls 10 ppb LCM pill w/Kwik Seal F. Mixed 100 bbls premix. Mud needs shearing.
13/03/99	906	**DRILLING** Adding XCD Polymer to increase the 6 RPM reading to above 10. Adding premix to maintain volume. Initiated Baracor 129 to the mud system. Installed Wilden pump to transfer premix, working very well. Barite on location 1044 sx. K+ % by vol = 3.28 PHPA concentration ppb = 0.3 Sulfite residual ppm = 80 Drilling and sliding, builing angle. Made wiper trip from 783 to 628 m, wash down ì to 640 m and RIH to 783 m, drilling.

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Daily Operations Log

DATE	DEPTH meters	OPERATION
14/03/99	1,049	DRILLING

Mixed 400 bbls of premix, transferred slowly to active for volume. Maintaining 6 RPM reading at 10. Changed screens on shakers to 84/110/110 mesh screens. Repaired desilter, all cones working. Sand content reduced from 1% to 0.5% Barite on location 1044 sx. K+ % by vol = 3.28 PHPA concentration ppb = 0.3 Sulfite residual ppm = 120

Drilling, rotating and sliding. Drilled to 935 m, wiper trip to 628 m, circulate and wash down to 640 m and RIH to 913 m. Precaution ream down to 935 m, Drilling.

15/03/99	1,154	WIPER TRIP

Mixed 100 bbls of KCL/Polymer premix. Treat system with Soda Ash to reduce ì calcium.

Barite on location 984 sx. K+ % by vol = 3.28. PHPA concentration ppb = 0.32. Sulfite residual ppm = 100.

Drill to 1153.6 m, circulate and swept hole with 40 bbls of mud with 10 ppb Kwik Seal fine. High concentration of cuttings when sweep to surface. Drop Gyro, slug pipe, pull out running Gyro to 485 m, csg shoe. Cut drill line, RIH. Running centrifuge and desilter while ì tripping to reduce sand contant. Changed shale shaker screens to 110 pyramid screens.

16/03/99	1,356	DRILLING

Mixed 400 bbls of premix, Transfer to active slowly for volume and dilution. Added soda ash to reduce calcium, Baracide for bacteria and Baracor 129 oxygen scavenger. Mixed 50 bbls LCM pill with 10 ppb of Kwik Seal medium.

Barite on location 984 sx. K+ % by vol = 3.4 PHPA concentration ppb = 0.3 Sulfite residual ppm = 120 Wilden pump working very well transferring fluid from premix to active.

RIH to 1141 m, circulate and wash to 1153 m, ì drilling.

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Daily Operations Log

DATE	DEPTH meters	OPERATION
17/03/99	1,382	**WASH / REAM**

Mixed 100 bbls premix. Ran centrifuge while drilling and during trip to control low gravity solids. Circulated LCM sweep to clean out hole, some increase in cuttings volume when sweep circulated out. pH and sulfite lower after trip.

Barite on location 904 sx K+ by vol = 3.25 PHPA concentration = 0.4 Sufite residual = 100

Drilled to 1382, sliding and rotating. Circulated, pumped 50 bbl LCM (Kwik Seal) sweep. POOH to 618.5m, circulated 1 hour, POOH. Lay out directional assembly. Picked ì up coring assembly. RIH to 656m, string ì taking weight. Washed/reamed 656 - 830m.

18/03/99	1,382	**CORING**

Mixed pit of premix, 100 bbls. Weight, sand % and solids increased due to fine solids from reaming operations. Increase occurred while centrifuge shut down during repairs. Run desilter and centrifuge during coring to reduce weight and solids.

Barite on location 880 sx K+ by vol = 3.5 PHPA concentration = 0.3 Sulfite residual = 80

Washed /reamed to bottom. Cut core from 1381 - 1382m.

19/03/99	1,439	**DRILLING**

Reduced sand content using desilter and centrifuge. Weight holding at 9.1 ppg. Prepared two batches of premix, approx 200 bbls. HTHP measured at 100 degC, simulating bottom hole temperature.

Barite on location 880 sx K+ % by vol = 3.4 PHPA concentration = 0.3 Sulfite residual = 80

Cut core #1 from 1382 - 1383m.Circulated, pumped slug and POOH. Laid out core barrel. Made up new bit and BHA, RIH to 406m. Slipped and cut line. RIH to 1370m, filling pipe every 10 stands. Washed 1370 - 1382m, reamed to 1383m. Drilled to 1439m.

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Daily Operations Log

DATE	DEPTH meters	OPERATION
20/03/99	1,455	**RIH TO CORE**

Prepared pit of premix. Run solids equipment to control sand content. Ran centrifuge while tripping to pick up core barrel. Weight increase due to barite from slugs.

Barite on location 829 sx K+ % by volume = 3.5 PHPA concentration = 0.3 Sulfite residual = 80

Drilled to 1448m. Flow check, well static. Circulated 2 x bottoms up. Flow check, slow seepage loss. POOH, broke circulation and worked string at 632-619m, circulated 2 x bottoms up. Continued POOH. Picked up core barrel. RIH, no problems. Cored 1448- 1455m POOH and recovered core. Picked up core barrel. RIH to 1442m, washed to bottom.

21/03/99	1,472	**RIH TO CORE**

Commenced addition of BARACARB bridging agent (grades 25 and 100 as programmed). Weight increased to 9.3 Sand content of 1.25% = 0.75% BARACARB, 0.5% drill solids. Ran centrifuge while tripping to reduce ì solids and sand content.

Barite on location 764 sx K+ % by volume = 3.6 PHPA concentration = 0.3 Sulfite residual = 80

Washed/reamed to 1455m. Circulated bottoms up. Cut core from 1455 - 1463.3m. POOH and recovered core. Made up core barrel and RIH, washed last 3 singles to bottom. Cut core from 1463.3 - 1472m. POOH and recovered core. Made up core barrel. RIH to 477m. Slipped and cut drill line. Continued RIH to 1461m.

22/03/99	1,560	**CIRCULATING HOLE**

Mud weight down to 9.2, MBT decreased affected low end rheology, added XCD polymer to maintain YP and 6 rpm. Ran centrifuge during trips. Treated with KOH and BARACIDE prior to logging and running casing. Pumped LCM pill (10 ppb Kwik Seal) to flush ì hole at TD, some increase in cuttings. Barite on location 764 sx K+ % volume = 3.5 PHPA concentration = 0.35 Sulfite residual = 60

Washed/reamed 1461-1472m, 4m fill. Cored 1472 -1478m. POOH, recovered core. RIH with bit. Reamed 1445 - 1478m, drilled ahead to 1560m. Pumped LCM pill, circulated hole clean.

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Daily Operations Log

DATE	DEPTH meters	OPERATION
23/03/99	1,560	**WIPER TRIP**

Error in mud losses reported yesterday, ì actual losses higher. Mud loss of 93 bbls ì includes correction for losses on 22/03/99. Increase in MBT due to increased silt, sand content increased to 0.75% due to silt. Silt ì particles have little effect on viscosity.

Barite on location 732 sacks K+ % by volume = 3.67 PHPA concentration = 0.25

Circulated hole clean. Survey. POOH to log, pumped out of tight hole from 1520 - 1440m. Ran Schlumberger logs : Run #1 - PEX PSI Run #2 - SAT (unsuccessful) Made up bit and BHA. RIH for wiper trip. Washed/reamed tight hole from 1455 -1467m

24/03/99	1,560	**RUN CASING**

Lost mud while running casing, casing filled up and overflowed while running last 2m or so on each joint. Recovered some volume from cellar back to pits. Minor seepage losses downhole (< 1 bbl/hr) Dumped and cleaned premix tank, used to prepare cement mix water. Dumped and flushed slug pit.

Reamed 1455 - 1562m; 9m of fill on bottom. Circulated hole, 2 x bottoms up. POOH, pumped out of tight hole from 1520 - 1455m. Ran 9-5/8" casing to 1557m.

25/03/99	1,558	**RUN VSP LOG**

Displaced with water during cementing of 9-5/8" casing, no mud left in hole. Dumped approximately 20 bbls of cement contaminated mud, phenolpthalein indicated pH increase but no other evidence of contamination. Salvaged 400 bbls to storage tank, transferred 473 bbls to sump for next well; to use salvaged mud to spud next well. Dump remaining mud in its. Cleaned pits. Carting clean water in preparation to mix 8.6 ppg KCl completion brine.

Circulated hole clean. Cemented 9-5/8" casing. Installed hanger and landed off casing. Cut casing, installed B-section and nippled up. Ran Schlumberger CBL log, followed by VSP log.

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Daily Operations Log

DATE	DEPTH meters	OPERATION
26/03/99	1,558	**LAY OUT PIPE** Mixed8.6ppg KCL brine, treated with COAT ì 2748. Displacewaterfrom hole with inhibited ì brine. Completed Schlumberger logs. Pressure tested BOP. RIH with scraper. Displaced hole to inhibited brine. POOH, laying out drill pipe.
27/03/99	1,558	**LAY OUT PIPE** Mixed additional KCl brine to fill tubing while RIH. "Mud lost" includes dead volume in pits plus mud displaced by tubing when running in (end of tubing closed) Ran 5-1/2" tubing. Made up test tree and ì equipment. Presure test.
28/03/99	1,558	**WELL TEST OPERATIONS** Prepared a further 115 bbls of 8.6 ppg brine, no corrosion inhibitor added at this time. Pressure test testing equipment. Rigged up lubricator and wireline equipment. retrieved plug. Pressure tested. RIH with wireline and opened SSD. Displaced tubing to annulus with nitrogen. Unable to close SSD, continue attempting to close SSD.
29/03/99	1,558	**RERUN TUBING** Mixed additional brine to ensure adequate volume to reverse circulate tubing before pulling tubing. Reverse circulated brine back to pits. Attempted to SSD, no success. Set X plug and rigged down wireline unit, lubricator and test tree. Pulled tubing out of hanger and broke out of packer. Reverse circulated tubing volume plus 20%. POOH with 5-1/2" tubing. Cleaned and inspected tubing and tools. Laid out SSD. Slipped and cut drill line. Rerun tubing.

Company:	Western Underground Gas Storage Pty. Ltd	Country:	AUSTRALIA
Well Name:	IONA-4	Geo Area:	OTWAY BASIN
Contractor:	O.D.& E.	Field:	PPL 2
Rig:	30	Region:	Victoria

Daily Operations Log

DATE	DEPTH meters	OPERATION
30/03/99	1,558	**KILL WELL**

No mud reatment made.

Continued running 5-1/2" tubing. Displaced tubing to annulus with nitrogen as. Made up and pressure tested test tree and lubricator. Tested well. Shut in and bled off. Set plug. Laid down lubricator and wireline. Pump KCl brine to kill well.

31/03/99 1,558 **RIG MOVE**

Pumped brine away to kill well after testing. Remaining brine dumped in preparation for rig move.

Pumped brine into tubing,bled off gas and killed well. Rig down test tree, lid out landing joint. Nippled down BOP. Dumped and cleaned mud tanks. Installed wellhead bonnet, secured wellhead. Rig released @ 18:00 hours. Commenced rig move to next location.

Company:	Western Underground Gas Storage Pty. Ltd	**Country:**	AUSTRALIA
Well Name:	IONA-4	**Geo Area:**	OTWAY BASIN
Contractor:	O.D.& E.	**Field:**	PPL 2
Rig:	30	**Region:**	Victoria

Bit and Hydraulic Record

DATE IN	BIT NO.	BIT SIZE in.	BIT MAKE	BIT TYPE	JETS or TFA	DEPTH OUT meters	DRILLED meters	HOURS RUN	CUM HOURS	WEIGHT ON BIT lb/1000	BIT RPM	PUMP OUTPUT gpm	ANN. VEL DP/DC m/min	PUMP PRESSURE psig	MUD WEIGHT ppg	BIT GRADING	MUD TYPE, LITHOLOGY, REMARKS
06/03/99	1	17.50	HTC	GTX-G1	18,22,22	639	634	27	27	20	130	798	17/25	1200	9	1-2-WT-A-E	KCL/EZ MUD/Polymer Claystone and sandstone, Drilled 17-1/2" hole to TD
12/03/99	2	12.25	SECURITY	ERA-03	3 X 24	639		3	29	10	80	571	14/29	700	9		
17/03/99	3	12.25	CORPRO	CM355F	TFA 1.20 S	1383	2	5	110	25	70	332	9/29	450	9	1-2-RG-G-X	KCL/EZ MUD/Polymer Claystone, sandstone Reamed to bottom (27 hrs), cut core #1
19/03/99	4	12.25	SECURITY	ERA-03D	3 X 18	1448	65	10	119	25	100	777	20/87	1980	9	1-1-NO-A-E	KCL/EZ MUD/Polymer Claystone, sandstone Drilled Ballast fmtn to core point #2
20/03/99	5	12.25	CORPRO	CM459EE	TFA 1.20 S	1455	7	3	122	30	80	399	0/0	650	9	-1-NO-A-X-	KCL/EZ MUD/Polymer Sandstone Cut core #2 (93% recovery)
12/03/99	2RR	12.25	HTC	ERA-03	3 X 24	1381	742	76	105	20	200	798	21/69	1650	9	5-5-WT-A-E	KCL/EZ MUD/Polymer, Claystone, sandstone Drilled to core point #1
22/03/99	4RR	12.25	SECURITY	ERA-03D	3 X 18	1560	82	10	137	25	90	777	20/87	2050	9	1-1-NO-A-E	KCL/EZ MUD/Polymer Sandstone, claystone, minor coal Drilled to TD at 1560m.
20/03/99	5RR	12.25	CORPRO	CM459EE	TFA 1.20 S	1463	8	2	124	10	80	227	0/0	280	9	1-1-NO-A-X	KCL/EZ MUD/Polymer Sandstone Cut core #3 (91% recovery)
21/03/99	5RR	12.25	CORPRO	CM459EE	TFA 1.20 S	1471	8	2	126	10	80	227	0/0	280	9	1-2-WT-S-X	KCL/EZ MUD/Polymer Sandstone Cut core #4 (78% recovery)
21/03/99	5RR	12.25	CORPRO	CM459EE	TFA 1.20 S	1478	7	2	128	10	80	227	0/0	280	9	1-2-WT-S-X	KCL/EZ MUD/Polymer Sandstone, minor claystone Cut core #5 (113% recovery)

908910 127

DAILY MUD REPORTS

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 1

Date	Depth
01/03/99	0.0 m [MD]
Spud Date	Present Activity
06/03/99	MOVING RIG

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size	in.
Type	
No. Jets	
Jets 32nd inch	
Tot Noz Area	
TFA	

DRILLING STRING

Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Collar OD	ID	Len.	
Collar OD	ID	Len.	

OPEN HOLE

Size	Len.
Size	Len.
Size	Len.
Size	Len.
Size	Len.

CASING

in.	m
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 5.5 X 8	Eff. 97.00	V/st 0.057	
spm 0	bbl/min 0.0		
Pump Make/Model	Gardner Denver		
Size 5.5 X 8	Eff. 97.00	V/st 0.057	
spm 0	bbl/min 0.0		
Pump Make/Model			
Size	Eff.	V/st	
spm	bbl/min		
Tot. Vol./min 0 gpm	0.0 bbl		
BU Time 0	TC Time 0		

MUD PROPERTIES

		Primary	2	3	Program Targets *=Excep P	2	3	Essential Program Properties
Source		Flowline						
Time		19:41						
FL Temp	Deg C	0						
Depth	m	0.0						< 629.1
Weight	ppg	0.0						< 9.0
FV @ 16 Deg C	sec/qt	28						
PV @ 49 Deg C	cP	1						< 30
YP	lbs/100 ft2	0						
Gels	lbs/100 ft2	0/0						
API Filt.	ml/30 min	0.0						< 15.0
HTHP @ 121 Deg C	ml/30 min	0.0						
Cake API/HTHP	32nd in	0/0						
Corr.Solids % by vol		0.0						
Oil/Water % by vol		0.0/0.0						
Sand % by vol								
MBT		0.0						
pH STRIP		0.0						< 9.0
Alk. Mud (Pm)		0.00						
Alk. Filtr. (Pf/Mf)		0.00/0.00						
Chlorides mg/l		0						
Hard. Ca mg/l		0						
Low Gravity Solids ppb		0.00						< 74.00

MUD TREATMENTS

RIG ACTIVITY

Moving rig to next location.

MATERIALS USED

NO INVENTORY USED ON THIS REPORT

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M		
Shkr #2	DFE - L/M		
dSlt #1	Harrisbug	12 * 4"	
Cent #1	DFE	70 GPM	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
0	0
Active Volume	
0	
Reserve	Total
450	450

Low Grav. vol %	0.0
ppb	0.00
High Grav. vol %	0.0
ppb	0.00
ASG	
Drill Cuttings	0
Dilution Rate	0.00
Slds Control Eff	85.00

MUD TYPE

KCL/EZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	0
Sea Water	0
Whole Mud	450
Barite	0
Chemicals	0
LOSSES	bbl
Dumped	0
Lost	0
VOL GAIN/LOSS	450

RHEOLOGY AND HYDRAULICS

600 rpm	
300 rpm	
200 rpm	
100 rpm	
6 rpm	
3 rpm	
Pressure Units:	psig
Press Drop, DP	0
Press Drop, BIT	0
Press Drop, ANN	0
Actual Circ. Press	0
AV, DP m/min	0.0
AV, DC m/min	0.0
AV, Riser m/min	

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	0.0
ECD ppg	
Csg. Shoe	0.0
TD	0.0
Max. Diff. Press	0

DEVIATION INFO

MD	0.0 m
TVD	0.0 m
Angle	0.00
Direction	
Horiz. Displ	0.0 m

TIME

DRLG	0.00
CIRC	0.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	24.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 0.00	$A 0.00

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 2

Date	Depth
02/03/99	0.0 m [MD]
Spud Date	Present Activity
06/03/99	MOVING RIG

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size	in.
Type	
No. Jets	
Jets 32nd inch	
Tot Noz Area	
TFA	

DRILLING STRING (in. / m)

Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Collar OD	ID	Len.	
Collar OD	ID	Len.	

OPEN HOLE (in. / m)

Size	Len.	
Size	Len.	
Size	Len.	
Size	Len.	

CASING

in.	m
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/et	0.068
spm 0	bbl/min	0.0	
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/et	0.068
spm 0	bbl/min	0.0	
Pump Make/Model			
Size	Eff.	V/et	
spm	bbl/min		
Tot. Vol./min	0 gpm	0.0	bbl
BU Time 0	TC Time	0	

MUD PROPERTIES

Source	Flowline			Program Targets *=Excep P	2	3	Essential Program Properties
Time	19:31						
FL Temp Deg C	0						
Depth m	0.0						< 629.1
Weight ppg	0.0						< 9.0
FV @ 16 Deg C sec/qt	28						
PV @ 49 Deg C cP	1						< 30
YP lbs/100 ft2	0						
Gels lbs/100 ft2	0/0						
API Filt. ml/30 min	0.0						< 15.0
HTHP @ 121 Deg C ml/30 min	0.0						
Cake API/HTHP 32nd in	2/0						
Corr.Solids % by vol	0.0						
Oil/Water % by vol	0.0/0.0						
Sand % by vol							
MBT	0.0						
pH STRIP	0.0						< 9.0
Alk. Mud (Pm)	0.00						
Alk. Filtr. (Pf/Mf)	0.00/0.00						
Chlorides mg/l	0						
Hard. Ca mg/l	0						
Low Gravity Solids ppb	0.00						< 74.00
LGS Volume % by vol	0.0						< 8.0
6 rpm	0			*			10.00 >
KCl Content ppb							

MUD TREATMENTS

RIG ACTIVITY

Moving rig to next location.

MATERIALS USED

NO INVENTORY USED ON THIS REPORT

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M		
Shkr #2	DFE - L/M		
dSlt #1	Harrisbug	12 * 4"	
Cent #1	DFE	70 GPM	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
0	0
Active Volume	
0	
Reserve	Total
450	450

Low Grav. vol %	0.0
ppb	0.00
High Grav. vol %	0.0
ppb	0.00
ASG	2.60
Drill Cuttings	0
Dilution Rate	0.00
Slds Control Eff	85.00

MUD TYPE

KCL/EZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	0
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	0
LOSSES	bbl
Dumped	0
Lost	0
VOL GAIN/LOSS	0

RHEOLOGY AND HYDRAULICS

600 rpm		
300 rpm		
200 rpm		
100 rpm		
6 rpm		
3 rpm		
Pressure Units:	psig	
Press Drop. DP	0	
Press Drop. BIT	0	
Press Drop. ANN	0	
Actual Circ. Press	0	
AV. DP m/min	0.0	
AV. DC m/min	0.0	
AV. Riser m/min		

FRACTURE GRADIENT

Water Depth		
Calc. F. Grad	0.0	
Leak Off Test	0.0	
ECD	ppg	
Csg. Shoe	0.0	
TD	0.0	
Max. Diff. Press	0	

DEVIATION INFO

MD	0.0	m
TVD	0.0	m
Angle	0.00	
Direction		
Horiz. Displ	0.0	m

TIME

DRLG	0.00
CIRC	0.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
RSAMING	0.00
TESTING	0.00
OTHER	24.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	SA 0.00	SA 0.00

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 131

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 3

Date	Depth
03/03/99	0.0 m [MD]
Spud Date	Present Activity
06/03/99	MOVING RIG

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size in.	
Type	
No. Jets	
Jets 32nd inch	
Tot Noz Area	
TFA	

DRILLING STRING (in. / m)

Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Collar OD	ID	Len.	
Collar OD	ID	Len.	

OPEN HOLE (in. / m)

Size	Len.
Size	Len.
Size	Len.
Size	Len.
Size	Len.

CASING

in.	m
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/st	0.068
spm 0	bbl/min 0.0		
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/st	0.068
spm 0	bbl/min 0.0		
Pump Make/Model			
Size	Eff.	V/st	
spm	bbl/min		
Tot. Vol./min 0 gpm	0.0 bbl		
BU Time 0	TC Time 0		

MUD PROPERTIES

Source	Primary: Flowline	2	3	Program Targets *=Excep P	2	3	Essential Program Properties
Time	15:04						
FL Temp Deg C	0						
Depth m	0.0						< 629.1
Weight ppg	0.0						< 9.0
FV @ 16 Deg C sec/qt	28						
PV @ 49 Deg C cP	1						< 30
YP lbs/100 ft2	0						
Gels lbs/100 ft2	0/0						
API Filt. ml/30 min	0.0						< 15.0
HTHP @ 121 Deg C ml/30 min	0.0						
Cake API/HTHP 32nd in	0/0						
Corr.Solids % by vol	0.0						
Oil/Water % by vol	0.0/0.0						
Sand % by vol							
MBT	0.0						
pH STRIP	0.0						< 9.0
Alk. Mud (Pm)	0.00						
Alk. Filtr. (Pf/Mf)	0.00/0.00						
Chlorides mg/l	0						
Hard. Ca mg/l	0						
Low Gravity Solids ppb	0.00						< 74.00
LGS Volume % by vol	0.0						< 8.0
6 rpm	0			*			10.00 >
KCl Content ppb							

MUD TREATMENTS

RIG ACTIVITY

Moving rig to next location.

MATERIALS USED

NO INVENTORY USED ON THIS REPORT

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFS - L/M		
Shkr #2	DFS - L/M		
dSlt #1	Harrisbug	12 * 4"	
Cent #1	DFS	70 GPM	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
0	0
Active Volume: 0	
Reserve	Total
450	450
Low Grav. vol % 0.0	ppb 0.00
High Grav. vol % 0.0	ppb 0.00
ASG	
Drill Cuttings 0	
Dilution Rate 0.00	
Slds Control Eff 85.00	

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	0
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	0
LOSSES	bbl
Dumped	0
Lost	0
VOL GAIN/LOSS	0

RHEOLOGY AND HYDRAULICS

600 rpm	
300 rpm	
200 rpm	
100 rpm	
6 rpm	
3 rpm	
Pressure Units:	psig
Press Drop, DP	0
Press Drop, BIT	0
Press Drop, ANN	0
Actual Circ. Press	0
AV, DP m/min	0.0
AV, DC m/min	0.0
AV, Riser m/min	

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	0.0
ECD ppg	
Csg. Shoe	0.0
TD	0.0
Max. Diff. Press	0

DEVIATION INFO

MD	0.0	m
TVD	0.0	m
Angle	0.00	
Direction		
Horiz. Displ	0.0	m

TIME

DRLG	0.00
CIRC	0.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	24.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 0.00	$A 0.00

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 4

Date	Depth
04/03/99	0.0 m [MD]
Spud Date	Present Activity
06/03/99	MOVING RIG

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size	in.
Type	
No. Jets	
Jets 32nd inch	
Tot Noz Area	
TFA	

DRILLING STRING (in. / m)

Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Collar OD	ID	Len.	
Collar OD	ID	Len.	

OPEN HOLE (in. / m)

Size	Len.
Size	Len.
Size	Len.
Size	Len.

CASING

in.	m
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
spm 0	bbl/min	0.0	
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
spm 0	bbl/min	0.0	
Pump Make/Model			
Size	Eff.	V/at	
spm	bbl/min		
Tot. Vol./min 0	gpm	0.0	bbl
BU Time 0	TC Time	0	

MUD PROPERTIES

		Primary	2	3	Program Targets *=Excep			Essential Program Properties
Source		Flowline						
Time		15:14						
FL Temp	Deg C	0						
Depth	m	0.0			P	2	3	< 629.1
Weight	ppg	0.0						< 9.0
FV @ 16 Deg C	sec/qt	28						
PV @ 49 Deg C	cP	1						< 30
YP	lbs/100 ft2	0						
Gels	lbs/100 ft2	0/0						
API Filt.	ml/30 min	0.0						< 15.0
HTHP @ 121 Deg C	ml/30 min	0.0						
Cake API/HTHP	32nd in	2/0						
Corr.Solids % by vol		0.0						
Oil/Water % by vol		0.0/0.0						
Sand % by vol								
MBT		0.0						
pH STRIP		0.0						< 9.0
Alk. Mud (Pm)		0.00						
Alk. Filtr. (Pf/Mf)		0.00/0.00						
Chlorides mg/l		0						
Hard. Ca mg/l		0						
Low Gravity Solids ppb		0.00						< 74.00
LGS Volume	% by vol	0.0						< 8.0
6 rpm		0			*			10.00 >
KCl Content	ppb							

MUD TREATMENTS

RIG ACTIVITY

Move rig on location.

MATERIALS USED

NO INVENTORY USED ON THIS REPORT

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DPE - L/M		
Shkr #2	DPE - L/M		
dSlt #1	Harrisbug	12 * 4"	
Cent #1	DPE	70 GPM	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
0	0
Active Volume	
0	
Reserve	Total
450	450

Low Grav. vol %	0.0
ppb	0.00
High Grav. vol %	0.0
ppb	0.00
ASG	2.60
Drill Cuttings	0
Dilution Rate	0.00
Slds Control Eff	85.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	0
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	0
LOSSES	bbl
Dumped	0
Lost	0
VOL GAIN/LOSS	0

RHEOLOGY AND HYDRAULICS

600 rpm	
300 rpm	
200 rpm	
100 rpm	
6 rpm	
3 rpm	
Pressure Units:	psig
Press Drop, DP	0
Press Drop, BIT	0
Press Drop, ANN	0
Actual Circ. Press	0
AV, DP m/min	0.0
AV, DC m/min	0.0
AV, Riser m/min	

FRACTURE GRADIENT

Water Depth		
Calc. F. Grad		0.0
Leak Off Test		0.0
ECD	ppg	
Csg. Shoe		0.0
TD		0.0
Max. Diff. Press		0

DEVIATION INFO

MD	0.0	m
TVD	0.0	m
Angle	0.00	
Direction		
Horiz. Displ	0.0	m

TIME

DRLG	0.00
CIRC	0.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	24.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 0.00	$A 0.00

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 133

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 5

Date	Depth
05/03/99	0.0 m [MD]
Spud Date	Present Activity
06/03/99	MOVING RIG

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size	in.
Type	
No. Jets	
Jets 32nd inch	
Tot Noz Area	
TFA	

DRILLING STRING

Pipe OD	ID	Len.	m
Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Collar OD	ID	Len.	
Collar OD	ID	Len.	

OPEN HOLE

Size	Len.
Size	Len.
Size	Len.
Size	Len.
Size	Len.

CASING

in.	m
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/st 0.068	
spm 0	bbl/min 0.0		
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/st 0.068	
spm 0	bbl/min 0.0		
Pump Make/Model			
Size	Eff.	V/st	
spm	bbl/min		
Tot. Vol./min 0	gpm 0.0	bbl	
BU Time 0	TC Time 0		

MUD PROPERTIES

Source	Primary: Flowline	2	3	Program Targets *=Excep P	2	3	Essential Program Properties
Time	20:01						
FL Temp Deg C	0						
Depth m	0.0						< 629.1
Weight ppg	0.0						< 9.0
FV @ 16 Deg C sec/qt	28						
PV @ 49 Deg C cP	1						< 30
YP lbs/100 ft2	0						
Gels lbs/100 ft2	0/0						
API Filt. ml/30 min	0.0						< 15.0
HTHP @ 121 Deg C ml/30 min	0.0						
Cake API/HTHP 32nd in	0/0						
Corr.Solids % by vol	0.0						
Oil/Water % by vol	0.0/0.0						
Sand % by vol							
MBT	0.0						
pH STRIP	0.0						< 9.0
Alk. Mud (Pm)	0.00						
Alk. Filtr. (Pf/Mf)	0.00/0.00						
Chlorides mg/l	0						
Hard. Ca mg/l	0						
Low Gravity Solids ppb	0.00						< 74.00
LGS-Volume % by vol	0.0						< 8.0
6 rpm	0			*			10.00 >
KCl Content ppb							

MUD TREATMENTS

RIG ACTIVITY

Rigging up rig.

MATERIALS USED

NO INVENTORY USED ON THIS REPORT

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	110	
Shkr #2	DFE - L/M	84	
dSlt #1	Harrisbug	12 * 4*	
Cent #1	DFE	70 GPM	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
0	0
Active Volume	
0	
Reserve	Total
300	300

Low Grav. vol %	0.0
ppb	0.00
High Grav. vol %	0.0
ppb	0.00
ASG	
Drill Cuttings	0
Dilution Rate	0.00
Slds Control Eff	85.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	0
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	0
LOSSES	bbl
Dumped	0
Lost	150
VOL GAIN/LOSS	-150

RHEOLOGY AND HYDRAULICS

600 rpm	
300 rpm	
200 rpm	
100 rpm	
6 rpm	
3 rpm	
Pressure Units:	psig
Press Drop, DP	0
Press Drop, BIT	0
Press Drop, ANN	0
Actual Circ. Press	0
AV, DP m/min	0.0
AV, DC m/min	0.0
AV, Riser m/min	

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	0.0
ECD ppg	
Csg. Shoe	0.0
TD	0.0
Max. Diff. Press	0

DEVIATION INFO

MD 0.0	m
TVD 0.0	m
Angle	0.00
Direction	
Horiz. Displ 0.0	m

TIME

DRLG	0.00
CIRC	0.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	24.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 0.00	$A 0.00

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 6

Date	Depth
06/03/99	23.0 m [MD]
Spud Date	Present Activity
06/03/99	DRILLING

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 17.5 in.
Type HTC GTX-G1
No. Jets
Jets 32nd inch
24 | 24 | 18
Tot Noz Area
TFA

DRILLING STRING (in. / m)

Pipe OD ID Len.
Pipe OD ID Len.
Pipe OD ID Len.
Collar OD 8 ID 3 Len. 23.0
Collar OD ID Len.

OPEN HOLE (in. / m)

Size 17.5 Len. 18.0
Size Len.
Size Len.
Size Len.
Size Len.

CASING

in. m
20 Set @ 5.0
Set @
Set @
Set @
Set @
Set @
Set @

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
spm 100	bbl/min		6.8
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
spm 0	bbl/min		0.0
Pump Make/Model			
Size	Eff.	V/at	
spm	bbl/min		
Tot. Vol./min 285 gpm		6.8	bbl
BU Time 3	TC Time		59

MUD PROPERTIES

Source	Primary Flowline	2 Pits, Circ	3 Pits, Uncr	Program Targets *=Excep P 2 3	Essential Program Properties
Time	22:30	21:50	15:00		
FL Temp Deg C	27	27	0		
Depth m	15.0	10.0	5.0		< 629.1
Weight ppg	8.9	8.9	8.9		< 9.0
FV @ 25 Deg C sec/qt	64	64	77		
PV @ 49 Deg C cP	20	19	22		< 30
YP lbs/100 ft2	18	18	18		
Gels lbs/100 ft2	4/7	2/5	2/4		
API Filt. ml/30 min	6.5	6.5	5.0		< 15.0
HTHP @ 121 Deg C ml/30 min	0.0	0.0	0.0		
Cake API/HTHP 32nd in	2/0	2/0	2/0		
Corr.Solids % by vol	3.2	3.2	3.2		
Oil/Water % by vol	0.0/95.5	0.0/95.5	0.0/95.5		
Sand % by vol	0.75	0.75	0.75		
MBT	12.0	12.0	10.0		
pH STRIP	8.5	8.3	8.5		< 9.0
Alk. Mud (Pm)	0.30	0.30	0.30		
Alk. Filtr. (Pf/Mf)	0.15/0.50	0.15/0.50	0.18/0.60		
Chlorides mg/l	22000	22000	22000		
Hard. Ca mg/l	120	120	120		
Low Gravity Solids ppb	29.39	29.39	29.39		< 74.00
LGS Volume % by vol	3.2	3.2	3.2		< 8.0
6 rpm	8	6	4		
KCl Content ppb	14.4	14.35	14.4		10.00 >

MUD TREATMENTS

Received 300 bbls of KCL/polymer mud from OBS-1 well. Reduced viscosity with premix. Mixed 300 bbls of premix. Added XCD polymer to increase 6 RPM reading.

Used high vis mud from OBS-1 well to mix 50 bbls of 10 ppb Kwik Seal Fine LCM pill. (10 sx).

RIG ACTIVITY

Drill Rat hole and Mouse hole with mud.

Spud well at 21:30 hrs on the 6/3/99.

Control drilling kelly down picking up drill collars.

Changed screens to 84 mesh on shaker #1 no larger screens available.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
SZ-MUD DP - 25 KG. BAG	1	175.44			
XCD Polymer - 55 LB. BAG	4	1891.04			
potassium chloride - 25 KG.	90	1170.00			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	84	3
Shkr #2	DFE - L/M	84	3
dSlt #1	Harrisbug	12 * 4"	
Cent #1	DFE	70 GPM	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
19	382
Active Volume	
401	
Reserve	Total
150	551

Low Grav. vol % 3.2
ppb 29.39
High Grav. vol % 0.0
ppb 0.00
ASG 2.52
Drill Cuttings 0
Dilution Rate 0.00
Slds Control Eff 75.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	300
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	4
LOSSES	bbl
Dumped	0
Lost	53
VOL GAIN/LOSS	251

RHEOLOGY AND HYDRAULICS

600 rpm	58	56	62
300 rpm	38	37	40
200 rpm	29	27	31
100 rpm	17	15	20
6 rpm	8	6	4
3 rpm	4	3	2

Pressure Units: psig
Press Drop. DP 10
Press Drop. BIT 52
Press Drop. ANN 1
Actual Circ. Press 80
AV, DP m/min 0.0
AV, DC m/min 8.8
AV, Riser m/min

FRACTURE GRADIENT

Water Depth
Calc. F. Grad 0.0
Leak Off Test 0.0
ECD ppg
Csg. Shoe 9.1
TD 9.1
Max. Diff. Press 0

DEVIATION INFO

MD 23.0 m
TVD 23.0 m
Angle 0.00
Direction
Horiz. Displ 0.0 m

TIME

DRLG	2.50
CIRC	0.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	21.50
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	SA 3236.48	SA 3236.48

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 135

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 7

Date	Depth
07/03/99	421.0 m [MD]
Spud Date	Present Activity
06/03/99	DRILLING

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 17.5 in.
Type HTC GTX-G1
No. Jets
Jets 32nd inch
24 | 24 | 18
Tot Noz Area
TFA

DRILLING STRING (in. / m)

Pipe OD 5 ID 3.000 Len. 80.7
Pipe OD 4 1/2 ID 4.000 Len. 273.0
Pipe OD ID Len.
Collar OD 8 ID 3 Len. 67.3
Collar OD ID Len.

OPEN HOLE (in. / m)

Size 17.5 Len. 416.0
Size Len.
Size Len.
Size Len.

CASING

in. m
20 Set @ 5.0
Set @
Set @
Set @
Set @
Set @
Set @

CIRCULATION DATA

Pump Make/Model Gardner Denver
Size 6 X 8 | Eff. 97.00 | V/st 0.068
spm 140 | bbl/min 9.5
Pump Make/Model Gardner Denver
Size 6 X 8 | Eff. 97.00 | V/st 0.068
spm 140 | bbl/min 9.5
Pump Make/Model
Size | Eff. | V/st
spm | bbl/min
Tot. Vol./min 799 gpm 19.0 bbl
BU Time 20 | TC Time 38

MUD PROPERTIES

Source	Primary: Pits, Circ	2: Flowline	3: Pits, Circ	Program Targets *=Excep	Essential Program Properties
Time	22:00	20:42	09:00		
FL Temp Deg C	29	32	30	P 2 3	
Depth m	383.0	383.0	136.0		< 629.1
Weight ppg	9.0	9.1	8.8	*	< 9.0
FV @ 28 Deg C sec/qt	45	46	50		
PV @ 49 Deg C cP	10	10	12		< 30
YP lbs/100 ft2	17	16	15		
Gels lbs/100 ft2	7/11	7/12	4/7		
API Filt. ml/30 min	7.5	7.6	6.0		< 15.0
HTHP @ 121 Deg C ml/30 min	0.0	0.0	0.0		
Cake API/HTHP 32nd in	1/0	1/0	1/0		
Corr.Solids % by vol	3.7	4.8	3.3		
Oil/Water % by vol	0.0/95.0	0.0/94.0	0.0/95.5		
Sand % by vol	1	1.5	0.75		
MBT	12.5	12.5	12.5		
pH STRIP	8.0	8.0	8.0		< 9.0
Alk. Mud (Pm)	0.25	0.25	0.25		
Alk Filtr. (Pf/Mf)	0.05/0.35	0.05/0.30	0.05/0.40		
Chlorides mg/l	22000	22000	21000		
Hard. Ca mg/l	120	120	120		
Low Gravity Solids ppb	34.03	43.23	29.94		< 74.00
LGS Volume % by vol	3.7	4.7	3.3		< 8.0
6 rpm	7	8	6	* * *	10.00 >
KCl Content ppb	14.35	14.3	14.25		

MUD TREATMENTS

Mixed 800 bbls of KCL/polymer premix, transferred to active for volume and dilution.
Maintaining 0.5 ppb of SZ Mud in the system.
Drilled the Gellibrand Marl section with no gumbo clay problems.
6 RPM reading kept at 7-8 as discussed with WUGS representatives.

RIG ACTIVITY

Drilling, ran survey at 195 m, 0.25 deg and at 360 m, 0.4 deg.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
SZ-MUD DP - 25 KG. BAG	8	1403.52			
PAC-R - 25 KG. BAG	1	189.83			
XCD Polymer - 55 LB. BAG	17	8036.92			
potassium chloride - 25 KG.	216	2808.00			
potassium hydroxide - 20 KG.	1	43.95			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	84	24
Shkr #2	DFE - L/M	84	24
dSlt #1	Harrisbug	12 * 4"	24
Cent #1	DFE	70 GPM	24

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
392	332
Active Volume	
724	
Reserve	Total
165	889

Low Grav. vol % 3.7
ppb 34.03
High Grav. vol % 0.0
ppb 0.00
ASG 2.64
Drill Cuttings 0
Dilution Rate 0.00
Slds Control Eff 75.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	800
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	14
LOSSES	bbl
Dumped	25
Lost	451
VOL GAIN/LOSS	338

RHEOLOGY AND HYDRAULICS

600 rpm	37	36	39
300 rpm	27	26	27
200 rpm	23	22	22
100 rpm	17	17	15
6 rpm	7	8	6
3 rpm	5	6	3

Pressure Units: psig
Press Drop. DP 519
Press Drop. BIT 409
Press Drop. ANN 10
Actual Circ. Press 1100
AV. DP m/min 17.5
AV. DC m/min 24.6
AV. Riser m/min

FRACTURE GRADIENT

Water Depth
Calc. F. Grad 0.0
Leak Off Test 0.0
ECD ppg
Csg. Shoe 9.1
TD 9.1
Max. Diff. Press 0

DEVIATION INFO

MD 421.0 m
TVD 421.0 m
Angle 0.00
Direction
Horiz. Displ 0.0 m

TIME

DRLG	21.00
CIRC	0.50
TRIPS	0.00
SERV. RIG	0.00
SURVEY	1.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORS	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	1.50
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 12482.22	$A 15718.70

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 8

Date	Depth
08/03/99	639.0 m [MD]
Spud Date	Present Activity
06/03/99	CIRCULATING

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 17.5 in.
Type HTC GTX-G1
No. Jets
Jets 32nd inch
24 | 24 | 18

Tot Noz Area
TFA

DRILLING STRING (in. / m)

Pipe OD 5 ID 3.000 Len. 298.7
Pipe OD 4 1/2 ID 4.000 Len. 273.0
Pipe OD ID Len.
Collar OD 8 ID 3 Len. 67.3
Collar OD ID Len.

OPEN HOLE (in. / m)

Size 17.5 Len. 634.0
Size Len.
Size Len.
Size Len.
Size Len.

CASING

in. m
20 Set @ 5.0
Set @
Set @
Set @
Set @
Set @
Set @

CIRCULATION DATA

Pump Make/Model Gardner Denver
Size 6 X 8 Eff. 97.00 V/st 0.068
spm 140 bbl/min 9.5
Pump Make/Model Gardner Denver
Size 6 X 8 Eff. 97.00 V/st 0.068
spm 140 bbl/min 9.5
Pump Make/Model
Size Eff. V/st
spm bbl/min
Tot. Vol./min 799 gpm 19.0 bbl
BU Time 30 TC Time 49

MUD PROPERTIES

	Primary	2	3	Program	Essential
Source	Flowline	Pits, Circ	Pits, Circ	Targets	Program
Time	23:30	13:30	10:00	*=Except	Properties
FL Temp Deg C	38	41	40	P 2 3	629.1 1560.6
Depth m	639.0	631.0	581.0		
Weight ppg	9.1	9.0	9.0		< 9.2
FV @ 38 Deg C sec/qt	46	46	46		
PV @ 49 Deg C cP	11	11	11		< 30
YP lbs/100 ft2	23	25	22		
Gels lbs/100 ft2	10/17	10/17	9/14		
API Filt. ml/30 min	7.4	7.4	7.4		6.0 8.0
HTHP @ 121 Deg C ml/30 min	0.0	0.0	0.0		
Cake API/HTHP 32nd in	1/0	1/0	1/0		
Corr.Solids % by vol	4.3	3.7	3.7		
Oil/Water % by vol	0.0/94.5	0.0/95.0	0.0/95.0		
Sand % by vol	1	1	1		
MBT	11.0	11.5	11.0		
pH STRIP	8.3	8.3	8.3	* *	8.5 9.2
Alk. Mud (Pm)	0.35	0.35	0.25		
Alk. Filtr. (Pf/Mf)	0.05/0.35	0.05/0.30	0.05/0.27		
Chlorides mg/l	21000	23000	22000		
Hard. Ca mg/l	100	100	100		
Low Gravity Solids ppb	38.40	33.49	34.03		< 74.00
LGS Volume % by vol	4.2	3.7	3.7		< 8.0
6 rpm	10	10	10		10.00 15.00
KCl Content ppb	14.1	14.35	14.2		

MUD TREATMENTS

Mixed 450 bbls of KCL/polymer premix, transferred to active for volume and dilution.
Swept hole at TD with 40 bbls high viscosity pill with 10 ppb of Kwik seal fine.
Kwik seal fine, 10 sx not charged. No price on each sx.

RIG ACTIVITY

Drilled to 631 m, circulate for sample, drill to 639 m TD, circulate out, pump and swept the hole with 40 bbls hi-vis pill. Light increase in cuttings when sweep to surface. Slug pipe, made wiper trip. Circulate out, high increase in cuttings over shakers on bottoms up, circ. until hole clean.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACIDE - 25 KG. CAN	2	362.88			
BZ-MUD DP - 25 KG. BAG	7	1228.08			
PAC-R - 25 KG. BAG	2	379.66			
XCD Polymer - 55 LB. BAG	12	5673.12			
barite - 25 KG. SACK	68	486.88			
potassium chloride - 25 KG.	122	1586.00			
potassium hydroxide - 20 KG.	5	219.75			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	84	21
Shkr #2	DFE - L/M	84	21
dSlt #1	Harrisbug	12 * 4"	24
Cent #1	DFE	70 GPM	24

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
594	344
Active Volume	
938	
Reserve	Total
	938

Low Grav. vol % 4.2
ppb 38.40
High Grav. vol % 0.1
ppb 1.47
ASG 2.73
Drill Cuttings 0
Dilution Rate 0.00
Slds Control Eff 75.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	450
Sea Water	0
Whole Mud	0
Barite	3
Chemicals	9
LOSSES	bbl
Dumped	20
Lost	393
VOL GAIN/LOSS	49

RHEOLOGY AND HYDRAULICS

600 rpm	45	47	44
300 rpm	34	36	33
200 rpm	30	30	28
100 rpm	24	24	22
6 rpm	10	10	10
3 rpm	8	8	8

Pressure Units: psig
Press Drop. DP 1070
Press Drop. BIT 414
Press Drop. ANN 20
Actual Circ. Press 1200
AV. DP m/min 17.5
AV. DC m/min 24.6
AV. Riser m/min

FRACTURE GRADIENT

Water Depth
Calc. F. Grad 0.0
Leak Off Test 0.0
ECD ppg
Csg. Shoe 9.3
TD 9.3
Max. Diff. Press 0

DEVIATION INFO

MD 639.0 m
TVD 639.0 m
Angle 0.00
Direction
Horiz. Displ 0.0 m

TIME

DRLG	13.00
CIRC	4.00
TRIPS	6.00
SERV. RIG	0.50
SURVEY	0.50
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORS	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	0.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 9936.37	$A 25655.07

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 137

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 9

Date	Depth
09/03/99	639.0 m [MD]
Spud Date	Present Activity
06/03/99	WORKING STUCK CSG

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size in.	
Type	
No. Jets	
Jets 32nd inch	
Tot Noz Area	
TFA	

DRILLING STRING

Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Collar OD	ID	Len.	
Collar OD	ID	Len.	

OPEN HOLE

Size	17.5	Len.	634.0
Size		Len.	
Size		Len.	
Size		Len.	
Size		Len.	

CASING

in.		m
20	Set @	5.0
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/st	0.068
spm 0	bbl/min	0.0	
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/st	0.068
spm 0	bbl/min	0.0	
Pump Make/Model			
Size	Eff.	V/st	
spm	bbl/min		
Tot. Vol./min	0 gpm	0.0	bbl
BU Time 0	TC Time	0	

MUD PROPERTIES

Source	Primary: Pits, Uncr	Pits, Circ	2	3	Program Targets **=Excep P	2	3	Essential Program Properties	
Time	09:30	17:00							
FL Temp Deg C	0	32							
Depth m	639.0	639.0						629.1	1560.6
Weight ppg	9.1	9.0						<	9.2
FV @ 32 Deg C sec/qt	47	50							
PV @ 49 Deg C cP	11	11						<	30
YP lbs/100 ft2	24	23							
Gels lbs/100 ft2	10/17	12/18							
API Filt. ml/30 min	7.4	8.0						6.0	8.0
HTHP @ 121 Deg C ml/30 min	0.0	0.0							
Cake API/HTHP 32nd in	1/0	1/0							
Corr.Solids % by vol	4.3	3.9							
Oil/Water % by vol	0.0/94.5	0.0/95.0							
Sand % by vol	1	0.75							
MBT	11.0	10.0							
pH STRIP	8.3	8.2			*	*		8.5	9.2
Alk. Mud (Pm)	0.35	0.25							
Alk. Filtr. (Pf/Mf)	0.05/0.35	0.03/0.35							
Chlorides mg/l	21000	19500							
Hard. Ca mg/l	100	100							
Low Gravity Solids ppb	38.40	35.31						<	74.00
LGS-Volume % by vol	4.2	3.9						<	8.0
6 rpm	10	11						10.00	15.00
KCl Content ppb	14.1	11.9							

MUD TREATMENTS

Run 13-3/8" csg, stuck at 504 m. Pump 50 bbls of 165 sec/qt hi-vis sweep, very light cuttings to surface. Mixed and spotted 50 bbls Torq Trim pill on bottom of csg, no success to release csg. Mixing 300 bbls of 3.5 % KCL fluid to displace well.
54 sx of Aquagel used for cement water, charged to the mud. Charged 10 sx of Kwik Seal Fine used on the 6/3/99.
Mixed cement water in mud pits, when transferring cement water to Halliburton tank, 50 bbls leaked to the mud system

RIG ACTIVITY

Stuck casing at 504 m. Circulate and worked casing. Swept hole with 50 bbls of XCD Polymer hi-vis mud. Spot 50 bbls of Torq Trim II stuck pipe fluid at the shoe, worked pipe and pumped 210 strokes each 30 minutes, total pumped 1050 strokes, no success. Mixing 300 bbls of 3.5 % KCL brine to displace the annulus.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
AQUAGEL - 25 KG. BAG	52	937.56			
KCL - Tech. - 25 KG. SACK	45	631.35			
Kwikseal Fine - 40 LB. BAG	10	442.30			
TORQ-TRIM - 55 GAL. DRUM	4	3049.16			
XCD Polymer - 55 LB. BAG	2	945.52			
potassium chloride - 25 KG.	22	286.00			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HP
Shkr #1	DFE - L/M	84	24
Shkr #2	DFE - L/M	84	24
dSlt #1	Harrisbug	12 * 4"	3
Cent #1	DFE	70 GPM	3

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
625	344
Active Volume	
969	
Reserve	Total
	969

Low Grav. vol %	4.2
ppb	38.40
High Grav. vol %	0.1
ppb	1.47
ASG	2.73
Drill Cuttings	0
Dilution Rate	0.00
Slds Control Eff	75.00

MUD TYPE

KCL/EZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	50
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	9
LOSSES	bbl
Dumped	28
Lost	0
VOL GAIN/LOSS	31

RHEOLOGY AND HYDRAULICS

600 rpm	46	45
300 rpm	35	34
200 rpm	30	29
100 rpm	24	24
6 rpm	10	11
3 rpm	8	10
Pressure Units:		psig
Press Drop, DP		0
Press Drop, BIT		0
Press Drop, ANN		0
Actual Circ. Press		0
AV, DP	m/min	0.0
AV, DC	m/min	0.0
AV, Riser	m/min	

FRACTURE GRADIENT

Water Depth		
Calc. F. Grad		0.0
Leak Off Test		0.0
ECD	ppg	
Csg. Shoe		0.0
TD		0.0
Max. Diff. Press		0

DEVIATION INFO

MD	639.0	m
TVD	639.0	m
Angle	0.00	
Direction		
Horiz. Displ	0.0	m

TIME

DRLG	0.00
CIRC	1.50
TRIPS	3.50
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	7.50
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	11.50
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WARSHOUSE	Welshpool	TELEPHONE	03 56881445	$A 6291.89	$A 31946.96

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 138

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 10

Date	Depth
10/03/99	639.0 m [MD]
Spud Date	Present Activity
06/03/99	NIPPLING UP BOP'S

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA	DRILLING STRING	CASING	CIRCULATION DATA
Size in.	Pipe OD ID Len.		Pump Make/Model Gardner Denver
Type	Pipe OD ID Len.	in. m	Size 6 X 8 Eff. 97.00 V/at 0.068
No. Jets	Pipe OD ID Len.	20 Set @ 5.0	gpm 0 bbl/min 0.0
Jets 32nd inch	Collar OD ID Len.	13 3/8 Set @ 504.0	Pump Make/Model Gardner Denver
	Collar OD ID Len.	Set @	Size 6 X 8 Eff. 97.00 V/at 0.068
	in. OPEN HOLE m	Set @	gpm 0 bbl/min 0.0
Tot Noz Area	Size 17.5 Len. 135.0	Set @	Pump Make/Model
TFA	Size Len.	Set @	Size Eff. V/at
	Size Len.	Set @	gpm bbl/min
	Size Len.	Set @	Tot. Vol./min 0 gpm 0.0 bbl
	Size Len.	Set @	BU Time 0 TC Time 0

MUD PROPERTIES

		Primary	2	3	Program Targets *=Excep	Essential Program Properties	
Source		Pits, Uncr					
Time		16:00					
FL Temp	Deg C	0					
Depth	m	639.0			P 2 3	629.1	1560.6
Weight	ppg	8.9				<	9.2
FV @ 27 Deg C	sec/qt	45					
PV @ 49 Deg C	cP	9				<	30
YP	lbs/100 ft2	16					
Gels	lbs/100 ft2	7/12					
API Filt.	ml/30 min	7.6				6.0	8.0
HTHP @ 121 Deg C	ml/30 min	0.0					
Cake API/HTHP	32nd in	1/0					
Corr.Solids	% by vol	3.4					
Oil/Water	% by vol	0.0/95.5					
Sand	% by vol	0.3					
MBT		7.5					
pH STRIP		8.1			*	8.5	9.2
Alk. Mud (Pm)		0.20					
Alk. Filtr. (Pf/Mf)		0.02/0.40					
Chlorides	mg/l	18500					
Hard. Ca	mg/l	80					
Low Gravity Solids	ppb	31.21				<	74.00
LGS Volume	% by vol	3.4				<	8.0
6 rpm		8			*	10.00	15.00
KCl Content	ppb	11					

MUD TREATMENTS

Mixed 300 bbls of 3% KCL brine, displaced the annulus with 250 bbls of KCL brine, worked pipe, no success. Displaced the annulus with KCL/polymer mud.
Piked up 50 bbls of KCL water in the system.

27 sx of Aquagel used for cement water, charged to the mud.

RIG ACTIVITY

Displaced annulus with 3% KCL fluid, worked pipe, no success, displaced back to mud. Mixed cement water, cement casing in place at 504 m. Nipping up BOP.

Casing stretch free point, calculated at 390 m

Barite on location 1084 sx.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
AQUAGEL - 25 KG. BAG	27	486.81			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DPE - L/M	84	8
Shkr #2	DPE - L/M	84	8
dSlt #1	Harrisbug	12 * 4"	0
Cent #1	DPE	70 GPM	0

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
387	482
Active Volume	
869	
Reserve	Total
150	1019

Low Grav. vol %	3.4
ppb	31.21
High Grav. vol %	0.0
ppb	0.00
AGG	2.54
Drill Cuttings	0
Dilution Rate	0.00
Slds Control Eff	75.00

MUD TYPE

KCL/EZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	50
Drill Water	0
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	0
LOSSES	**bbl**
Dumped	0
Lost	0
VOL GAIN/LOSS	50

RHEOLOGY AND HYDRAULICS

600 rpm	34
300 rpm	25
200 rpm	21
100 rpm	17
6 rpm	8
3 rpm	6
Pressure Units:	psig
Press Drop, DP	0
Press Drop, BIT	0
Press Drop, ANN	0
Actual Circ. Press	0
AV, DP m/min	0.0
AV, DC m/min	0.0
AV, Riser m/min	

FRACTURE GRADIENT

Water Depth		
Calc. F. Grad	0.0	
Leak Off Test	0.0	
ECD	ppg	
Csg. Shoe	0.0	
TD	0.0	
Max. Diff. Press	0	

DEVIATION INFO

MD	639.0	m
TVD	639.0	m
Angle	0.00	
Direction		
Horiz. Displ	0.0	m

TIME

DRLG	0.00
CIRC	8.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	3.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	13.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME		TELEPHONE	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE 03 56881445	$A 486.81	$A 32433.77

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 139

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 11

Date	Depth
11/03/99	639.0 m [MD]
Spud Date	Present Activity
06/03/99	RUNNING IN HOLE

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size in.	
Type	
No. Jets	
Jets 32nd inch	
Tot Noz Area	
TFA	

DRILLING STRING (m)

Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Collar OD	ID	Len.	
Collar OD	ID	Len.	

OPEN HOLE (m)

Size	17.5	Len.	135.0
Size		Len.	
Size		Len.	
Size		Len.	
Size		Len.	

CASING

in.		m
20	Set @	5.0
13 3/8	Set @	504.0
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/pt	0.068
spm 0	bbl/min	0.0	
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/pt	0.068
spm 0	bbl/min	0.0	
Pump Make/Model			
Size	Eff.	V/pt	
spm	bbl/min		
Tot. Vol./min 0	gpm	0.0	bbl
BU Time 0	TC Time	0	

MUD PROPERTIES

		Primary	2	3	Program Targets *=Excep			Essential Program Properties	
Source		Pits, Uncr							
Time		16:00							
FL Temp	Deg C	0							
Depth	m	639.0			P	2	3	629.1	1560.6
Weight	ppg	8.9						<	9.2
FV @ 25 Deg C	sec/qt	45							
PV @ 49 Deg C	cP	9						<	30
YP	lbs/100 ft2	16							
Gels	lbs/100 ft2	7/12							
API Filt.	ml/30 min	7.6						6.0	8.0
HTHP @ 121 Deg C	ml/30 min	0.0							
Cake API/HTHP	32nd in	1/0							
Corr.Solids % by vol		3.4							
Oil/Water % by vol		0.0/95.5							
Sand % by vol		0.3							
MBT		7.5							
pH STRIP		8.1			*			8.5	9.2
Alk. Mud (Pm)		0.20							
Alk. Filtr. (Pf/Mf)		0.02/0.40							
Chlorides mg/l		18500							
Hard. Ca mg/l		80							
Low Gravity Solids ppb		31.21						<	74.00
LGS Volume	% by vol	3.4						<	8.0
6 rpm		8			*			10.00	15.00
KCl Content	ppb	11							

MUD TREATMENTS

Prepare to drill cement.

Barite on location 1084 sx.

RIG ACTIVITY

Nipple up and test BOP's, Running in hole.

MATERIALS USED

NO INVENTORY USED ON THIS REPORT

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFS - L/M	84	0
Shkr #2	DFS - L/M	84	0
dSlt #1	Harrisbug	12 * 4"	0
Cent #1	DFS	70 GPM	0

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
387	482
Active Volume	
869	
Reserve	Total
150	1019

Low Grav. vol %	3.4
ppb	31.21
High Grav. vol %	0.0
ppb	0.00
ASG	2.54
Drill Cuttings	0
Dilution Rate	0.00
Slds Control Eff	75.00

MUD TYPE

KCL/EZ MUD/POLYMER

MUD CONSUMPTION		bbl
ADDITIONS		
	Oil	0
	Brine Water	0
	Drill Water	0
	Sea Water	0
	Whole Mud	0
	Barite	0
	Chemicals	0
LOSSES		bbl
	Dumped	0
	Lost	0
VOL GAIN/LOSS		0

RHEOLOGY AND HYDRAULICS

600 rpm	34
300 rpm	25
200 rpm	21
100 rpm	17
6 rpm	8
3 rpm	6
Pressure Units:	psig
Press Drop, DP	0
Press Drop, BIT	0
Press Drop, ANN	0
Actual Circ. Press	0
AV, DP m/min	0.0
AV, DC m/min	0.0
AV, Riser m/min	

FRACTURE GRADIENT

Water Depth		
Calc. F. Grad		0.0
Leak Off Test		0.0
ECD	ppg	
Csg. Shoe		0.0
TD		0.0
Max. Diff. Press		0

DEVIATION INFO

MD	639.0	m
TVD	639.0	m
Angle	0.00	
Direction		
Horiz. Displ	0.0	m

TIME

DRLG	0.00
CIRC	0.00
TRIPS	5.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	19.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 0.00	$A 32433.77

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 12

Date	Depth
12/03/99	644.0 m [MD]
Spud Date	Present Activity
06/03/99	DRILLING

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria
WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA
IONA-4	PPL 2	Otway Basin

COUNTRY: Austral

BIT DATA

Size 12.25" in.
Type Sec BRA-03
No. Jets
Jets 32nd inch: 24 | 24 | 24
Tot Noz Area
TFA

DRILLING STRING

Pipe OD	5	ID	3.000	Len.	288.4 m
Pipe OD	4 1/2	ID	4.000	Len.	323.0
Pipe OD		ID		Len.	
Collar OD	8	ID	3	Len.	32.6
Collar OD		ID		Len.	

OPEN HOLE

Size	17.5	Len.	135.0 m
Size	12.25	Len.	5.0
Size		Len.	
Size		Len.	
Size		Len.	

CASING

	in.	m
20	Set @	5.0
13 3/8	Set @	504.0
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
gpm 100	bbl/min		6.8
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
gpm 100	bbl/min		6.8
Pump Make/Model			
Size	Eff.	V/at	
gpm	bbl/min		

Tot. Vol./min 570 gpm 13.6 bbl
BU Time 25 TC Time 64

MUD PROPERTIES

Source	Primary	2	3	Program Targets *=Excep			Essential Program Properties	
	Pits, Uncr	Pits, Circ	Flowline	P	2	3	629.1	1560.6
Time	23:00	06:30	00:30					
FL Temp Deg C	27	29	28					
Depth m	644.0	639.0	639.0					
Weight ppg	8.6	8.7	8.9				<	9.2
FV @ 28 Deg C sec/qt	56	70	46					
PV @ 49 Deg C cP	9	10	9					
YP lbs/100 ft2	17	16	16				<	30
Gels lbs/100 ft2	6/8	7/14	6/11					
API Filt. ml/30 min	9.2	14.0	8.0	*	*		6.0	8.0
HTHP @ 121 Deg C ml/30 min	0.0	0.0	0.0					
Cake API/HTHP 32nd in	1/0	1/0	1/0					
Corr.Solids % by vol	1.6	2.9	3.5					
Oil/Water % by vol	0.0/97.0	0.0/96.5	0.0/95.5					
Sand % by vol	tr	0.3	0.3					
MBT	0.0	7.5	7.5					
pH STRIP	8.2	12.5	8.9	*	*		8.5	9.2
Alk. Mud (Pm)	0.05	1.40	0.45					
Alk. Filtr. (Pf/Mf)	0.01/0.35	0.60/0.90	0.15/0.40					
Chlorides mg/l	24000	18000	18000					
Hard. Ca mg/l	120	280	200					
Low Gravity Solids ppb	14.47	22.30	31.49					
LGS Volume % by vol	1.6	2.5	3.5				<	74.00
6 rpm	9	8	8	*	*	*	<	8.0
KCl Content ppb	15.4	10.5	11				10.00	15.00

MUD TREATMENTS

RIH to top of cement at 490 m. Drill out the shoe track, bottoms up at 490 m, mud contaminated with cement, conditioned with Bicarb and Citric acid. Drilled out casing shoe circulate and ran LOT. RIH to 639 m, circulate, mud in rat hole contaminated with cement, pH 12.5. PHPA came over the shakers in clumps. Lost mud over shakers and dumped severe contaminated mud. Treat system with Citric acid, Bicarb and water with minimal results. Mixed slug POOH.

RIG ACTIVITY

While POOH, dumped and clean mud pits, salvaged 200 bbls of KCL/Polymer mud in reserve. Mixed 600 bbls of 4% KCL/polymer mud, sheared mud with rig pump for 9 Hrs. RIH with a directional drilling assembly to 639 m, pumped 40 bbls water spacer and displaced hole with freshly built KCL polymer mud. POOH to csg shoe at 504 m, ran LOT, results 12.0 ppg EMW. RIH Drilling. Mixed 50 bbls 10 ppb LCM pill w/Kwik Seal F. Mixed 100 bbls premix.
Mud needs shearing.

MATERIALS USED

Product	Used	Cost
BZ-MUD DP - 25 KG. BAG	4	701.76
Kwikseal Fine - 40 LB. BAG	10	442.30
PAC-L - 25 KG. BAG	9	1708.47
PAC-R - 25 KG. BAG	6	1138.98
XCD Polymer - 55 LB. BAG	14	6618.64
barite - 25 KG. SACK	40	286.40
citric acid - 25 KG. BAG	20	1241.00
potassium chloride - 25 KG.	185	2405.00
sodium bicarbonate - 25 KG.	7	120.12

Product / Used / Cost

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	84	10
Shkr #2	DFE - L/M	84	10
dSlt #1	Harrisbug	12 * 4"	0
Cent #1	DFE	70 GPM	0

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
365	498
Active Volume	
863	
Reserve	Total
	863

Low Grav. vol % 1.6
ppb 14.47
High Grav. vol % 0.0
ppb 0.00
ASG 1.65
Drill Cuttings 0
Dilution Rate 0.00
Slds Control Eff 75.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	686
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	14
LOSSES	bbl
Dumped	819
Lost	37
VOL GAIN/LOSS	-156

RHEOLOGY AND HYDRAULICS

600 rpm	35	36	34
300 rpm	26	26	25
200 rpm	22	23	21
100 rpm	16	18	17
6 rpm	9	8	8
3 rpm	6	6	6

Pressure Units: psig
Press Drop, DP 496
Press Drop, BIT 146
Press Drop, ANN 22
Actual Circ. Press 700
AV, DP m/min 14.9
AV, DC m/min 49.5
AV, Riser m/min

FRACTURE GRADIENT

Water Depth
Calc. F. Grad 0.0
Leak Off Test 12.0
ECD ppg
Csg. Shoe 8.8
TD 8.8
Max. Diff. Press 0

DEVIATION INFO

MD 644.0 m
TVD 644.0 m
Angle 0.00
Direction
Horiz. Displ 0.0 m

TIME

DRLG	1.50
CIRC	5.00
TRIPS	11.50
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	1.50
TESTING	2.00
OTHER	2.50
AVERAGE ROP	0.00

BAROID REPRESENTATIVE				
Gerald Lange	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311
	WAREHOUSE	Welshpool	TELEPHONE	03 56881445

DAILY COST $A 14662.67
CUMULATIVE COST $A 47096.44

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 141

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 13

Date	Depth
13/03/99	906.0 m [MD]
Spud Date	Present Activity
06/03/99	DRILLING

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 12.25" in.
Type Sec BRA-03
No. Jets
Jets 32nd inch
24 | 24 | 24
Tot Noz Area
TFA

DRILLING STRING (in. / m)

Pipe OD	5	ID	3.000	Len.	550.4
Pipe OD	4 1/2	ID	4.000	Len.	323.0
Pipe OD		ID		Len.	
Collar OD	8	ID	3	Len.	32.6
Collar OD		ID		Len.	

OPEN HOLE (in. / m)

Size	17.5	Len.	135.0
Size	12.25	Len.	267.0
Size		Len.	
Size		Len.	
Size		Len.	

CASING

in.		m	
20	Set @	5.0	
13 3/8	Set @	504.0	
	Set @		
	Set @		
	Set @		
	Set @		
	Set @		

CIRCULATION DATA

Pump Make/Model	Gardner Denver				
Size	6 X 8	Eff.	97.00	V/at	0.068
gpm	134	bbl/min	9.1		
Pump Make/Model	Gardner Denver				
Size	6 X 8	Eff.	97.00	V/at	0.068
gpm	134	bbl/min	9.1		
Pump Make/Model					
Size		Eff.		V/at	
gpm		bbl/min			
Tot. Vol./min	764	gpm	18.2	bbl	
BU Time	24	TC Time	44		

MUD PROPERTIES

Source	Primary 2		3	Program Targets *=Excep.			Essential Program Properties	
	Flowline	Pits, Circ	Flowline	P	2	3	629.1	1560.6
Time	22:20	16:45	10:45					
FL Temp Deg C	41	38	32					
Depth m	906.0	822.0	775.0					
Weight ppg	8.7	8.6	8.6				<	9.2
FV @ 32 Deg C sec/qt	51	45	44					
PV @ 49 Deg C cP	12	10	10				<	30
YP lbs/100 ft2	24	17	18					
Gels lbs/100 ft2	10/12	6/8	6/8					
API Filt. ml/30 min	6.6	7.6	7.8				6.0	8.0
HTHP @ 121 Deg C ml/30 min	0.0	0.0	0.0					
Cake API/HTHP 32nd in	1/0	1/0	1/0					
Corr.Solids % by vol	1.7	0.9	1.0					
Oil/Water % by vol	0.0/97.0	0.0/97.8	0.0/97.8					
Sand % by vol	1.5	1.25	2					
MBT	7.5	5.0	5.0					
pH STRIP	8.5	8.5	8.5				8.5	9.2
Alk. Mud (Pm)	0.25	0.25	0.25					
Alk. Filtr. (Pf/Mf)	0.08/0.35	0.10/0.35	0.08/0.30					
Chlorides mg/l	22000	22500	21000					
Hard. Ca mg/l	180	180	200					
Low Gravity Solids ppb	15.56	7.92	8.74				<	74.00
LGS Volume % by vol	1.7	0.9	1.0				<	8.0
6 rpm	10	8	8		*	*	10.00	15.00
KCl Content ppb	11.5	11.0	10.5					

MUD TREATMENTS

Adding XCD Polymer to increase the 6 RPM reading to above 10. Adding premix to maintain volume. Initiated Baracor 129 to the mud system.
Installed Wilden pump to transfer premix, working very well.

Barite on location 1044 sx.
K+ % by vol = 3.28
PHPA concentration ppb = 0.3
Sulfite residual ppm = 80

RIG ACTIVITY

Drilling and sliding, builing angle.
Made wiper trip from 783 to 628 m, wash down to 640 m and RIH to 783 m, drilling.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACOR 129 - 25 KG. CAN	4	259.92			
PAC-L - 25 KG. BAG	8	1518.64			
XCD Polymer - 55 LB. BAG	14	6618.64			
potassium chloride - 25 KG.	63	819.00			
potassium hydroxide - 20 KG.	4	175.80			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFS - L/M	84	24
Shkr #2	DFS - L/M	84	24
dSlt #1	Harrisbug	12 * 4"	24
Cent #1	DFS	70 GPM	24

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
477	315
Active Volume	
792	
Reserve	Total
40	832

Low Grav. vol % 1.7
ppb 15.56
High Grav. vol % 0.0
ppb 0.00
ASG 2.44
Drill Cuttings 0
Dilution Rate 0.00
Slds Control Eff 75.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
* Drill Water	246
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	4
LOSSES	bbl
Dumped	40
Lost	241
VOL GAIN/LOSS	-31

RHEOLOGY AND HYDRAULICS

600 rpm	48	37	38
300 rpm	36	27	28
200 rpm	31	23	24
100 rpm	24	18	18
6 rpm	10	8	8
3 rpm	8	6	6

Pressure Units: psig
Press Drop, DP 1484
Press Drop, BIT 265
Press Drop, ANN 47
Actual Circ. Press 1300
AV, DP m/min 20.0
AV, DC m/min 66.4
AV, Riser m/min

FRACTURE GRADIENT

Water Depth
Calc. F. Grad 0.0
Leak Off Test 12.0
ECD ppg
Csg. Shoe 9.0
TD 9.0
Max. Diff. Press 0

DEVIATION INFO

MD	906.0	m
TVD	871.0	m
Angle	22.50	
Direction	262.1	
Horiz. Displ	45.1	m

TIME

DRLG	20.00
CIRC	1.50
TRIPS	1.00
SERV. RIG	1.50
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORS	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	0.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	SA 9392.00	SA 56488.44

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 14

Date	Depth
14/03/99	1049.0m [MD]
Spud Date	Present Activity
06/03/99	DRILLING

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria
WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA
IONA-4	PPL 2	Otway Basin

COUNTRY: Austral

BIT DATA

Size 12.25" in.
Type Sec SRA-03
No. Jets
Jets 32nd inch
24 | 24 | 24
Tot Noz Area
TFA

DRILLING STRING (in. / m)

Pipe OD 5 ID 3.000 Len. 693.4
Pipe OD 4 1/2 ID 4.000 Len. 323.0
Pipe OD ID Len.
Collar OD 8 ID 3 Len. 32.6
Collar OD ID Len.

OPEN HOLE (in. / m)

Size 17.5 Len. 135.0
Size 12.25 Len. 410.0
Size Len.
Size Len.
Size Len.

CASING

in.	m	
20	Set @	5.0
13 3/8	Set @	504.0
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	

CIRCULATION DATA

Pump Make/Model: Gardner Denver
Size 6 X 8 | Eff. 97.00 | V/at 0.068
gpm 140 | bbl/min 9.5
Pump Make/Model: Gardner Denver
Size 6 X 8 | Eff. 97.00 | V/at 0.068
gpm 140 | bbl/min 9.5
Pump Make/Model
Size | Eff. | V/at
gpm | bbl/min
Tot. Vol./min 799 gpm 19.0 bbl
BU Time 26 | TC Time 54

MUD PROPERTIES

Source	Primary Pits, Circ	2 Pits, Circ	3 Pits, Circ	Program Targets *=Excep			Essential Program Properties	
				P	2	3	629.1	1560.6
Time	21:50	16:30	10:30					
FL Temp Deg C	42	41	41					
Depth m	1049.0	1014.0	964.0					
Weight ppg	8.7	8.7	8.7				<	9.2
FV @ 38 Deg C sec/qt	53	54	50					
PV @ 49 Deg C cP	11	11	11				<	30
YP lbs/100 ft2	28	28	29					
Gels lbs/100 ft2	11/16	11/16	11/15					
API Filt. ml/30 min	6.6	7.0	6.8				6.0	8.0
HTHP @ 121 Deg C ml/30 min	13.4	13.8	0.0					
Cake API/HTHP 32nd in	1/2	1/2	1/0					
Corr.Solids % by vol	1.8	1.7	1.6					
Oil/Water % by vol	0.0/97.0	0.0/97.0	0.0/97.0					
Sand % by vol	0.5	0.75	1.0					
MBT	5.0	5.0	5.0					
pH STRIP	8.5	8.5	8.4				8.5	9.2
Alk. Mud (Pm)	0.20	0.20	0.15					
Alk. Filtr. (Pf/Mf)	0.08/0.40	0.08/0.40	0.05/0.45					
Chlorides mg/l	21000	22000	24000					
Hard. Ca mg/l	200	180	200					
Low Gravity Solids ppb	16.11	15.56	14.47					
LGS Volume % by vol	1.8	1.7	1.6				<	74.00
6 rpm	11	11	12				<	8.0
KCl Content ppb	11.5	11.5	12.3				10.00	15.00

MUD TREATMENTS

Mixed 400 bbls of premix, transferred slowly to active for volume.
Maintaining 6 RPM reading at 10.
Changed screens on shakers to 84/110/110 mesh screens. Repaired desilter, all cones working. Sand content reduced from 1% to 0.5%
Barite on location 1044 sx.
K+ % by vol = 3.28
PHPA concentration ppb = 0.3
Sulfite residual ppm = 120

RIG ACTIVITY

Drilling, rotating and sliding. Drilled to 935 m, wiper trip to 628 m, circulate and wash down to 640 m and RIH to 913 m.
Precaution ream down to 935 m, Drilling.

MATERIALS USED

Product	Used	Cost
BARACOR 129 - 25 KG. CAN	3	194.94
SZ-MUD DP - 25 KG. BAG	1	175.44
PAC-L - 25 KG. BAG	9	1708.47
XCD Polymer - 55 LB. BAG	16	7564.16
potassium chloride - 25 KG.	100	1300.00
potassium hydroxide - 20 KG.	5	219.75

Product	Used	Cost

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DPS - L/M	84/110	24
Shkr #2	DPS - L/M	84/110	24
dSlt #1	Harrisbug	12 * 4*	24
Cent #1	DPS	70 GPM	24

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
538	485
Active Volume	
1023	
Reserve	Total
40	1063

Low Grav. vol % 1.8
ppb 16.11
High Grav. vol % 0.0
ppb 0.00
ASG 2.45
Drill Cuttings 68
Dilution Rate 1.90
Slds Control Eff 75.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	391
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	9
LOSSES	bbl
Dumped	50
Lost	119
VOL GAIN/LOSS	231

RHEOLOGY AND HYDRAULICS

600 rpm	50	50	51
300 rpm	39	39	40
200 rpm	34	34	34
100 rpm	26	27	27
6 rpm	11	11	12
3 rpm	9	9	10

Pressure Units: psig
Press Drop. DP 1918
Press Drop, BIT 289
Press Drop, ANN 63
Actual Circ. Press 1500
AV, DP m/min 21.2
AV, DC m/min 69.3
AV, Riser m/min

FRACTURE GRADIENT

Water Depth
Calc. F. Grad 0.0
Leak Off Test 12.0
ECD PPG
Csg. Shoe 9.1
TD 9.1
Max. Diff. Press 0

DEVIATION INFO

MD	1049.0	m
TVD	989.0	m
Angle	32.90	
Direction	262.2	
Horiz. Displ	107.0	m

TIME

DRLG	18.00
CIRC	1.50
TRIPS	1.50
SERV. RIG	1.50
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	1.50
AVERAGE ROP	7.95

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 11162.76	$A 67651.20

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 143

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 15

Date	Depth
15/03/99	1153.6m [MD]
Spud Date	Present Activity
06/03/99	WIPER TRIP

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 12.25" in.
Type Sec BRA-03
No. Jets
Jets 32nd inch
24 | 24 | 24
Tot Noz Area
TFA

DRILLING STRING (in. / m)

Pipe OD	5	ID 3.000	Len.	798.0
Pipe OD	4 1/2	ID 4.000	Len.	323.0
Pipe OD		ID	Len.	
Collar OD	8	ID 3	Len.	32.6
Collar OD		ID	Len.	

OPEN HOLE (in. / m)

Size	17.5	Len.	135.0
Size	12.25	Len.	514.6
Size		Len.	
Size		Len.	
Size		Len.	

CASING

	in.		m
20	Set @	5.0	
13 3/8	Set @	504.0	
	Set @		
	Set @		
	Set @		
	Set @		
	Set @		

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/st	0.068
spm 140	bbl/min	9.5	
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/st	0.068
spm 140	bbl/min	9.5	
Pump Make/Model			
Size	Eff.	V/st	
spm	bbl/min		
Tot. Vol./min 799 gpm	19.0 bbl		
BU Time 29	TC Time 59		

MUD PROPERTIES

		Primary	2	3				Essential	
Source		Pits, Uncr	Flowline	Pits, Circ	Program			Program	
Time		22:00	16:30	11:00	Targets			Properties	
FL Temp	Deg C	0	49	44	*=Excep				
Depth	m	1153.6	1139.0	1111.0	P	2	3	629.1	1560.6
Weight	ppg	8.7	8.8	8.7				<	9.2
FV @ 42 Deg C	sec/qt	50	50	50					
PV @ 49 Deg C	cP	10	12	11				<	30
YP	lbs/100 ft2	28	30	30					
Gels	lbs/100 ft2	11/17	12/18	11/17					
API Filt.	ml/30 min	6.4	6.6	6.4				6.0	8.0
HTHP @ 121 Deg C	ml/30 min	14.8	15.2	0.0					
Cake API/HTHP	32nd in	1/2	1/2	1/2					
Corr.Solids % by vol		1.7	2.2	1.8					
Oil/Water % by vol		0.0/97.0	0.0/96.5	0.0/97.0					
Sand % by vol		0.25	0.5	0.5					
MBT		5.0	5.0	5.0					
pH STRIP		8.5	8.5	8.5				8.5	9.2
Alk. Mud (Pm)		0.20	0.20	0.25					
Alk. Filtr. (Pf/Mf)		0.08/0.55	0.10/0.55	0.10/0.45					
Chlorides mg/l		22000	22000	21000					
Hard. Ca mg/l		180	200	200					
Low Gravity Solids ppb		15.56	20.20	16.11				<	74.00
LGS Volume	% by vol	1.7	2.2	1.8				<	8.0
6 rpm		11	12	12				10.00	15.00
KCl Content	ppb	11.5	11.5	11.3					

MUD TREATMENTS

Mixed 100 bbls of KCL/Polymer premix.
Treat system with Soda Ash to reduce calcium.

Barite on location 984 sx.
K+ % by vol = 3.28.
PHPA concentration ppb = 0.32.
Sulfite residual ppm = 100.

RIG ACTIVITY

Drill to 1153.6 m, circulate and swept hole with 40 bbls of mud with 10 ppb Kwik Seal fine. High concentration of cuttings when sweep to surface. Drop Gyro, slug pipe, pull out running Gyro to 485 m, csg shoe. Cut drill line, RIH.
Running centrifuge and desilter while tripping to reduce sand contant.
Changed shale shaker screens to 110 pyramid screens.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BZ-MUD DP - 25 KG. BAG	1	175.44			
PAC-L - 25 KG. BAG	2	379.66			
PAC-R - 25 KG. BAG	1	189.83			
XCD Polymer - 55 LB. BAG	2	945.52			
barite - 25 KG. SACK	60	429.60			
potassium chloride - 25 KG.	37	481.00			
potassium hydroxide - 20.KG.	2	87.90			
soda ash - 25 KG. BAG	2	30.00			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	110	24
Shkr #2	DFE - L/M	110	24
dSlt #1	Harrisbug	12 * 4"	24
Cent #1	DFE	70 GPM	24

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
583	530
Active Volume	
1113	
Reserve	Total
	1113

Low Grav. vol % 1.7
ppb 15.56
High Grav. vol % 0.0
ppb 0.00
ASG 2.44
Drill Cuttings 0
Dilution Rate 0.00
Slds Control Eff 75.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	97
Sea Water	0
Whole Mud	0
Barite	2
Chemicals	3
LOSSES	bbl
Dumped	30
Lost	22
VOL GAIN/LOSS	50

RHEOLOGY AND HYDRAULICS

600 rpm	48	54	52
300 rpm	38	42	41
200 rpm	32	37	35
100 rpm	26	29	28
6 rpm	11	12	12
3 rpm	9	10	10

Pressure Units: psig
Press Drop, DP 2125
Press Drop, BIT 289
Press Drop, ANN 70
Actual Circ. Press 1650
AV, DP m/min 21.2
AV, DC m/min 69.3
AV, Riser m/min

FRACTURE GRADIENT

Water Depth
Calc. F. Grad 0.0
Leak Off Test 12.0
ECD ppg
Csg. Shoe 9.1
TD 9.1
Max. Diff. Press 0

DEVIATION INFO

MD	1153.6	m
TVD	1077.6	m
Angle	44.00	
Direction	262.8	
Horiz. Displ	178.1	m

TIME

DRLG	14.00
CIRC	1.00
TRIPS	2.50
SERV. RIG	4.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	2.50
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 2718.95	$A 70370.15

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 16

Date	Depth
16/03/99	1356.0m [MD]
Spud Date	Present Activity
06/03/99	DRILLING

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 12.25" in.		
Type Sec SRA-03		
No. Jets		
Jets 32nd inch		
24	24	24
Tot Noz Area		
TFA		

DRILLING STRING (in. / m)

Pipe OD	5	ID	3.000	Len.	1000.4
Pipe OD	4 1/2	ID	4.000	Len.	323.0
Pipe OD		ID		Len.	
Collar OD	8	ID	3	Len.	32.6
Collar OD		ID		Len.	

OPEN HOLE (in. / m)

Size	17.5	Len.	135.0
Size	12.25	Len.	717.0
Size		Len.	
Size		Len.	
Size		Len.	

CASING

in.		m	
20	Set @	5.0	
13 3/8	Set @	504.0	
	Set @		
	Set @		
	Set @		
	Set @		
	Set @		

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
spm 135	bbl/min		9.2
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
spm 135	bbl/min		9.2
Pump Make/Model			
Size	Eff.	V/at	
spm	bbl/min		
Tot. Vol./min	770 gpm	18.3	bbl
BU Time 34	TC Time	59	

MUD PROPERTIES

		Primary Flowline	2 Pits, Circ	3 Flowline	Program Targets *=Excep			Essential Program Properties	
Source									
Time		22:15	16:00	09:50					
FL Temp	Deg C	51	49	49					
Depth	m	1347.0	1300.0	1226.0	P	2	3	629.1	1560.6
Weight	ppg	8.9	8.8	8.9				<	9.2
FV @ 47 Deg C	sec/qt	50	54	50					
PV @ 49 Deg C	cP	12	12	11				<	30
YP	lbs/100 ft2	30	29	32					
Gels	lbs/100 ft2	11/19	11/17	12/18					
API Filt.	ml/30 min	6.4	6.4	6.2				6.0	8.0
HTHP @ 121 Deg C	ml/30 min	15.8	15.6	15.8					
Cake API/HTHP	32nd in	1/2	1/2	1/2					
Corr.Solids % by vol		3.2	2.2	3.2					
Oil/Water % by vol		0.0/95.5	0.0/96.5	0.0/95.5					
Sand % by vol		0.5	0.5	0.75					
MBT		7.5	7.5	5.0					
pH STRIP		8.5	8.5	8.5				8.5	9.2
Alk. Mud (Pm)		0.20	0.20	0.20					
Alk. Filtr. (Pf/Mf)		0.10/0.70	0.10/0.65	0.10/0.65					
Chlorides mg/l		22000	22500	22000					
Hard. Ca mg/l		200	200	200					
Low Gravity Solids ppb		29.39	19.93	29.39				<	74.00
LGS Volume	% by vol	3.2	2.2	3.2				<	8.0
6 rpm		12	11	12				10.00	15.00
KCl Content	ppb	11.8	12.5	11.8					

MUD TREATMENTS

Mixed 400 bbls of premix, Transfer to active slowly for volume and dilution.
Added soda ash to reduce calcium, Baracide for bacteria and Baracor 129 oxygen scavenger.
Mixed 50 bbls LCM pill with 10 ppb of Kwik Seal medium.

Barite on location 984 sx.
K+ % by vol = 3.4
PHPA concentration ppb = 0.3
Sulfite residual ppm = 120

RIG ACTIVITY

RIH to 1141 m, circulate and wash to 1153 m, drilling.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACIDE - 25 KG. CAN	1	181.44	soda ash - 25 KG. BAG	4	60.00
BARACOR 129 - 25 KG. CAN	4	259.92			
EZ-MUD DP - 25 KG. BAG	4	701.76			
Kwikseal Medium - 40 LB. BAG	10	437.10			
PAC-L - 25 KG. BAG	8	1518.64			
PAC-R - 25 KG. BAG	4	759.32			
XCD Polymer - 55 LB. BAG	8	3782.08			
potassium chloride - 25 KG.	120	1560.00			
potassium hydroxide - 20 KG.	4	175.80			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	110	24
Shkr #2	DFE - L/M	110	24
dSlt #1	Harrisbug	12 * 4"	24
Cent #1	DFE	70 GPM	24

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
669	410
Active Volume	
1079	
Reserve	Total
50	1129

Low Grav. vol %	3.2
ppb	29.39
High Grav. vol %	0.0
ppb	0.00
ASG	2.52
Drill Cuttings	6
Dilution Rate	6.62
Slds Control Eff	75.00

MUD TYPE

KCL/EZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	390
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	10
LOSSES	bbl
Dumped	80
Lost	304
VOL GAIN/LOSS	16

RHEOLOGY AND HYDRAULICS

600 rpm	54	53	54
300 rpm	42	41	43
200 rpm	36	35	37
100 rpm	29	28	29
6 rpm	12	11	12
3 rpm	9	9	10

Pressure Units:	psig	
Press Drop, DP	2569	
Press Drop, BIT	275	
Press Drop, ANN	89	
Actual Circ. Press	1650	
AV, DP	m/min	20.5
AV, DC	m/min	66.9
AV, Riser	m/min	

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	12.0
ECD ppg	
Csg. Shoe	9.3
TD	9.3
Max. Diff. Press	0

DEVIATION INFO

MD	1356.0	m
TVD	1213.3	m
Angle	45.70	
Direction	263.9	
Horiz. Displ	325.2	m

TIME

DRLG	23.00
CIRC	0.00
TRIPS	1.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	0.00
AVERAGE ROP	0.56

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 9436.06	$A 79806.21

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

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Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 17

Date	Depth
17/03/99	1382.0m [MD]
Spud Date	Present Activity
06/03/99	WASH / REAM

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 12.25" in.	
Type Corpro CM355P	
No. Jets	
Jets 32-in	
Tot Noz Area	
TFA 1.200	

DRILLING STRING (in. / m)

Pipe OD	4 1/2	ID	3.826	Len.	504.2
Pipe OD	5	ID	3.000	Len.	283.3
Pipe OD		ID		Len.	
Collar OD	8	ID	3	Len.	42.5
Collar OD		ID		Len.	

OPEN HOLE (in. / m)

Size	17.5	Len.	135.0
Size	12.25	Len.	743.0
Size		Len.	
Size		Len.	
Size		Len.	

CASING

	in.		m
20	Set @		5.0
13 3/8	Set @		504.0
	Set @		
	Set @		
	Set @		
	Set @		
	Set @		

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
gpm 104	bbl/min	7.1	
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
gpm 104	bbl/min	7.1	
Pump Make/Model			
Size	Eff.	V/at	
gpm	bbl/min		
Tot. Vol./min	593 gpm	14.1	bbl
BU Time 29	TC Time	54	

MUD PROPERTIES

Source	Primary: Pits, Circ	2: Pits, Circ	3	Program Targets *=Excep	Essential Program Properties
Time	23:45	09:45			
FL Temp Deg C	41	52			
Depth m	1382.0	1382.0		P 2 3	629.1 1560.6
Weight ppg	9.0	9.0			< 9.2
FV @ 46 Deg C sec/qt	51	48			
PV @ 49 Deg C cP	11	11			< 30
YP lbs/100 ft2	27	28			
Gels lbs/100 ft2	10/18	10/19			
API Filt. ml/30 min	5.8	6.0		*	6.0 8.0
HTHP @ 121 Deg C ml/30 min	16.0	16.6			
Cake API/HTHP 32nd in	1/2	1/2			
Corr.Solids % by vol	3.7	3.7			
Oil/Water % by vol	0.0/95.0	0.0/95.0			
Sand % by vol	0.3	0.25			
MBT	7.5	7.5			
pH STRIP	8.3	8.4		* *	8.5 9.2
Alk. Mud (Pm)	0.20	0.20			
Alk. Filtr. (Pf/Mf)	0.04/0.67	0.10/0.65			
Chlorides mg/l	22000	22000			
Hard. Ca mg/l	190	180			
Low Gravity Solids ppb	34.03	34.03			< 74.00
LGS Volume % by vol	3.7	3.7			< 8.0
6 rpm	10	11			10.00 15.00
KCl Content ppb	11.5	11.3			

MUD TREATMENTS

Mixed 100 bbls premix.
Ran centrifuge while drilling and during trip to control low gravity solids.
Circulated LCM sweep to clean out hole, some increase in cuttings volume when sweep circulated out.
pH and sulfite lower after trip.

Barite on location 904 sx
K+ by vol = 3.25
PHPA concentration = 0.4
Sufite residual = 100

RIG ACTIVITY

Drilled to 1382, sliding and rotating. Circulated, pumped 50 bbl LCM (Kwik Seal) sweep. POOH to 618.5m, circulated 1 hour, POOH. Lay out directional assembly. Picked up coring assembly. RIH to 656m, string taking weight. Washed/reamed 656 - 830m.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
SZ-MUD DP - 25 KG. BAG	1	175.44			
PAC-L - 25 KG. BAG	2	379.66			
PAC-R - 25 KG. BAG	1	189.83			
XCD Polymer - 55 LB. BAG	1	472.76			
barite - 25 KG. SACK	80	572.80			
potassium chloride - 25 KG.	30	390.00			
potassium hydroxide - 20 KG.	1	43.95			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFS - L/M	110	14
Shkr #2	DFS - L/M	110	14
dSlt #1	Harrisbug	12 * 4"	8
Cent #1	DFS	70 GPM	15

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
712	319
Active Volume	
1031	
Reserve	Total
100	1131

Low Grav. vol %	3.7
ppb	34.03
High Grav. vol %	0.0
ppb	0.00
ASG	2.64
Drill Cuttings	0
Dilution Rate	0.00
Slds Control Eff	75.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	90
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	5
LOSSES	bbl
Dumped	0
Lost	93
VOL GAIN/LOSS	2

RHEOLOGY AND HYDRAULICS

600 rpm	49	50
300 rpm	38	39
200 rpm	32	33
100 rpm	25	26
6 rpm	10	11
3 rpm	8	9
Pressure Units:		psig
Press Drop, DP		690
Press Drop, BIT		201
Press Drop, ANN		67
Actual Circ. Press		575
AV, DP	m/min	15.5
AV, DC	m/min	51.5
AV, Riser	m/min	

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	12.0
ECD ppg	
Csg. Shoe	9.3
TD	9.3
Max. Diff. Press	0

DEVIATION INFO

MD	1382.0	m
TVD	1251.8	m
Angle	48.80	
Direction	264.3	
Horiz. Displ	367.7	m

TIME

DRLG	6.50
CIRC	2.00
TRIPS	9.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	5.00
TESTING	0.00
OTHER	1.50
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 2224.45	$A 82030.65

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 18

Date	Depth
18/03/99	1382.0m [MD]
Spud Date	Present Activity
06/03/99	CORING

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 12.25" in.
Type Corpro CM35SF
No. Jets
Jets sq-in
Tot Noz Area
TFA 1.200

DRILLING STRING

Pipe OD	4 1/2	ID	3.826	Len.	1056.2
Pipe OD	5	ID	3.000	Len.	283.3
Pipe OD		ID		Len.	
Collar OD	8	ID	3	Len.	42.5
Collar OD		ID		Len.	

OPEN HOLE

Size	17.5	Len.	135.0
Size	12.25	Len.	743.0
Size		Len.	
Size		Len.	
Size		Len.	

CASING

in.		m	
20	Set @	5.0	
13 3/8	Set @	504.0	
	Set @		
	Set @		
	Set @		
	Set @		
	Set @		
	Set @		

CIRCULATION DATA

Pump Make/Model	Gardner Denver				
Size	6 X 8	Eff.	97.00	V/at	0.068
gpm	116	bbl/min	7.9		
Pump Make/Model	Gardner Denver				
Size	6 X 8	Eff.	97.00	V/at	0.068
gpm	0	bbl/min	0.0		
Pump Make/Model					
Size		Eff.		V/at	
gpm		bbl/min			
Tot. Vol./min	331	gpm	7.9	bbl	
BU Time	82	TC Time	130		

MUD PROPERTIES

Source		Pits, Circ	Pits, Circ		Program Targets *=Excep			Essential Program Properties	
Time		24:00	13:00						
FL Temp	Deg C	40	41						
Depth	m	1382.0	1382.0		P	2	3	629.1	1560.6
Weight	ppg	9.1	9.0					<	9.2
FV @ 38 Deg C	sec/qt	55	51						
PV @ 49 Deg C	cP	13	12					<	30
YP	lbs/100 ft2	28	27						
Gels	lbs/100 ft2	10/18	9/16						
API Filt.	ml/30 min	5.9	5.6		*	*		6.0	8.0
HTHP @ 121 Deg C	ml/30 min	17.2	18.0						
Cake API/HTHP	32nd in	1/2	1/2						
Corr.Solids % by vol		4.2	3.7						
Oil/Water % by vol		0.0/94.5	0.0/95.0						
Sand % by vol		0.75	0.5						
MBT		8.0	8.0						
pH STRIP		8.5	8.3			*		8.5	9.2
Alk. Mud (Pm)		0.15	0.08						
Alk. Filtr. (Pf/Mf)		0.08/0.73	0.07/0.65						
Chlorides mg/l		23000	22000						
Hard. Ca mg/l		232	240						
Low Gravity Solids ppb		37.49	34.03					<	74.00
LGS Volume	% by vol	4.1	3.7					<	8.0
6 rpm		11	10					10.00	15.00
KCl Content	ppb	12	12.25						

MUD TREATMENTS

Mixed pit of premix, 100 bbls.
Weight, sand % and solids increased due to fine solids from reaming operations.
Increase occurred while centrifuge shut down during repairs. Run desilter and centrifuge during coring to reduce weight and solids.

Barite on location 880 sx
K+ by vol = 3.5
PHPA concentration = 0.3

RIG ACTIVITY

Washed /reamed to bottom. Cut core from 1381 - 1382m.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACOR 129 - 25 KG. CAN	1	64.98			
EZ-MUD DP - 25 KG. BAG	1	175.44			
PAC-L - 25 KG. BAG	1	189.83			
PAC-R - 25 KG. BAG	2	379.66			
XCD Polymer - 55 LB. BAG	3	1418.28			
barite - 25 KG. SACK	24	171.84			
potassium chloride - 25 KG.	40	520.00			
potassium hydroxide - 20 KG.	3	131.85			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	110	24
Shkr #2	DFE - L/M	110	24
dSlt #1	Harrisbug	12 * 4"	17
Cent #1	DFE	70 GPM	13

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
702	323
Active Volume	
1025	
Reserve	Total
69	1094

Low Grav. vol %	4.1
ppb	37.49
High Grav. vol %	0.1
ppb	1.47
ASG	2.73
Drill Cuttings	0
Dilution Rate	0.00
Slds Control Eff	75.00

MUD TYPE

KCL/EZ MUD/POLYMER

MUD CONSUMPTION	bbl
ADDITIONS	
Oil	0
Brine Water	0
Drill Water	90
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	6
LOSSES	bbl
Dumped	0
Lost	133
VOL GAIN/LOSS	-37

RHEOLOGY AND HYDRAULICS

600 rpm	54	51
300 rpm	41	39
200 rpm	35	33
100 rpm	28	26
6 rpm	11	10
3 rpm	9	8

Pressure Units:		psig
Press Drop. DP		341
Press Drop. BIT		63
Press Drop. ANN		82
Actual Circ. Press		450
AV. DP	m/min	8.7
AV. DC	m/min	28.7
AV. Riser	m/min	

FRACTURE GRADIENT

Water Depth		
Calc. F. Grad		0.0
Leak Off Test		12.0
ECD	ppg	
Csg. Shoe		9.4
TD		9.4
Max. Diff. Press		0

DEVIATION INFO

MD	1382.0	m
TVD	1251.8	m
Angle	48.80	
Direction	264.3	
Horiz. Displ	367.7	m

TIME

DRLG	0.00
CIRC	0.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	2.00
BACK REAM	0.00
REAMING	22.00
TESTING	0.00
OTHER	0.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 3051.88	$A 85082.53

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 19

Date	Depth
19/03/99	1439.0m [MD]
Spud Date	Present Activity
06/03/99	DRILLING

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 12.25" in.
Type Security SRA03D
No. Jets
Jets 32nd inch
18 | 18 | 18
Tot Noz Area
TFA

DRILLING STRING (in. / m)

Pipe OD	4 1/2	ID	3.826	Len. 1123.4
Pipe OD	5	ID	3.000	Len. 283.3
Pipe OD		ID		Len.
Collar OD	8	ID	3	Len. 32.3
Collar OD		ID		Len.

OPEN HOLE (in. / m)

Size	17.5	Len.	135.0
Size	12.25	Len.	800.0
Size		Len.	
Size		Len.	
Size		Len.	

CASING

in.		m
20	Set @	5.0
13 3/8	Set @	504.0
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	

CIRCULATION DATA

Pump Make/Model: Gardner Denver
Size 6 X 8 | Eff. 97.00 | V/st 0.068
gpm 136 | bbl/min 9.2

Pump Make/Model: Gardner Denver
Size 6 X 8 | Eff. 97.00 | V/st 0.068
gpm 136 | bbl/min 9.2

Pump Make/Model
Size | Eff. | V/st
gpm | bbl/min
Tot. Vol./min 776 gpm 18.5 bbl
BU Time 36 | TC Time 59

MUD PROPERTIES

	Primary	2	3	Program Targets *=Excep	Essential Program Properties	
Source	Pits, Circ	Pits, Uncr				
Time	23:50	14:00				
FL Temp Deg C	49	0				
Depth m	1439.0	1383.0		P 2 3	629.1	1560.6
Weight ppg	9.1	9.1			<	9.2
FV @ 31 Deg C sec/qt	52	57				
PV @ 49 Deg C cP	13	13			<	30
YP lbs/100 ft2	25	25				
Gels lbs/100 ft2	9/17	9/18				
API Filt. ml/30 min	6.2	5.4		*	6.0	8.0
HTHP @ 100 Deg C ml/30 min	17.2	17.2				
Cake API/HTHP 32nd in	1/2	1/2				
Corr.Solids % by vol	4.2	4.2				
Oil/Water % by vol	0.0/94.5	0.0/94.5				
Sand % by vol	0.5	0.25				
MBT	8.0	8.0				
pH STRIP	8.5	8.5			8.5	9.2
Alk. Mud (Pm)	0.08	0.08				
Alk. Filtr. (Pf/Mf)	0.06/0.78	0.07/0.71				
Chlorides mg/l	23000	23000				
Hard. Ca mg/l	200	216				
Low Gravity Solids ppb	37.49	37.49			<	74.00
LGS Volume % by vol	4.1	4.1			<	8.0
6 rpm	10	10			10.00	15.00
KCl Content ppb	12	12.5				

MUD TREATMENTS

Reduced sand content using desilter and centrifuge. Weight holding at 9.1 ppg. Prepared two batches of premix, approx 200 bbls.
HTHP measured at 100 degC, simulating bottom hole temperature.

Barite on location 880 sx
K+ % by vol = 3.4
PHPA concentration = 0.3
Sulfite residual = 80

RIG ACTIVITY

Cut core #1 from 1382 - 1383m.Circulated, pumped slug and POOH. Laid out core barrel. Made up new bit and BHA, RIH to 406m. Slipped and cut line. RIH to 1370m, filling pipe every 10 stands. Washed 1370 - 1382m, reamed to 1383m. Drilled to 1439m.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACOR 129 - 25 KG. CAN	1	64.98			
EZ-MUD DP - 25 KG. BAG	2	350.88			
PAC-L - 25 KG. BAG	2	379.66			
PAC-R - 25 KG. BAG	4	759.32			
XCD Polymer - 55 LB. BAG	4	1891.04			
potassium chloride - 25 KG.	70	910.00			
potassium hydroxide - 20 KG.	5	219.75			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFS - L/M	110	15
Shkr #2	DFS - L/M	110	15
dSlt #1	Harrisbug	12 * 4"	13
Cent #1	DFS	70 GPM	13

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
730	359
Active Volume	
1089	
Reserve	Total
105	1194

Low Grav, vol % 4.1
ppb 37.49
High Grav, vol % 0.1
ppb 1.47
ASG 2.73
Drill Cuttings 27
Dilution Rate 1.65
Slds Control Eff 75.00

MUD TYPE

KCL/EZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	190
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	6
LOSSES	bbl
Dumped	0
Lost	96
VOL GAIN/LOSS	100

RHEOLOGY AND HYDRAULICS

600 rpm	51	51
300 rpm	38	38
200 rpm	32	33
100 rpm	25	25
6 rpm	10	10
3 rpm	8	8

Pressure Units: psig
Press Drop. DP 13
Press Drop. BIT 901
Press Drop. ANN 0
Actual Circ. Press 1960
AV, DP m/min 20.3
AV, DC m/min 67.4
AV, Riser m/min

FRACTURE GRADIENT

Water Depth
Calc. F. Grad 0.0
Leak Off Test 12.0
ECD ppg
Csg. Shoe 9.1
TD 9.1
Max. Diff. Press 0

DEVIATION INFO

MD	1439.0	m
TVD	0.0	m
Angle	48.80	
Direction	264.3	
Horiz. Displ	418.0	m

TIME

DRLG	8.50
CIRC	0.50
TRIPS	8.50
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	3.50
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	3.00
AVERAGE ROP	6.71

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 4575.63	$A 89658.16

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

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Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 20

Date	Depth
20/03/99	1455.0m [MD]
Spud Date	Present Activity
06/03/99	RIH TO CORE

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	J.Murray	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 12.25" in.	
Type Corpro CM459EE	
No. Jets	
Jets 32-in	
Tot Noz Area	
TFA 1.200	

DRILLING STRING (in. / m)

Pipe OD	4 1/2	ID	3.826	Len.	1129.2
Pipe OD	5	ID	3.000	Len.	283.3
Pipe OD		ID		Len.	
Collar OD	8	ID	3	Len.	42.5
Collar OD		ID		Len.	

OPEN HOLE (in. / m)

Size	17.5	Len.	135.0
Size	12.25	Len.	816.0
Size		Len.	
Size		Len.	
Size		Len.	

CASING (in. / m)

20	Set @	5.0	
13 3/8	Set @	504.0	
	Set @		
	Set @		
	Set @		
	Set @		
	Set @		
	Set @		

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
spm 70	bbl/min	4.8	
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
spm 70	bbl/min	4.8	
Pump Make/Model			
Size	Eff.	V/at	
spm	bbl/min		
Tot. Vol./min	399 gpm	9.5	bbl
BU Time 71	TC Time	117	

MUD PROPERTIES

		Primary	2	3	Program Targets **Except	Essential Program Properties	
Source		Pits, Circ	Pits, Circ				
Time		23:50	13:30				
FL Temp	Deg C	40	42				
Depth	m	1455.0	1455.0		P 2 3	629.1	1560.6
Weight	ppg	9.2	9.2			<	9.2
FV @ 39 Deg C	sec/qt	52	48				
PV @ 49 Deg C	cP	13	12			<	30
YP	lbs/100 ft2	24	23				
Gels	lbs/100 ft2	9/200	8/19				
API Filt.	ml/30 min	6.1	5.7		*	6.0	8.0
HTHP @ 100 Deg C	ml/30 min	19.2	18.6				
Cake API/HTHP	32nd in	1/2	1/2				
Corr.Solids % by vol		4.8	4.8				
Oil/Water % by vol		0.0/94.0	0.0/94.0				
Sand % by vol		0.5	0.5				
MBT		10.0	9.0				
pH STRIP		8.5	8.5			8.5	9.2
Alk. Mud (Pm)		0.10	0.05				
Alk. Filtr. (Pf/Mf)		0.12/0.78	0.07/0.73				
Chlorides mg/l		22000	22000				
Hard. Ca mg/l		212	256				
Low Gravity Solids ppb		40.31	40.31			<	74.00
LGS-Volume	% by vol	4.4	4.4			<	8.0
6 rpm		10	9			10.00	15.00
KCl Content	ppb	12	2.25				

MUD TREATMENTS

Prepared pit of premix.
Run solids equipment to control sand content. Ran centrifuge while tripping to pick up core barrel. Weight increase due to barite from slugs.

Barite on location 829 sx
K+ % by volume = 3.5
PHPA concentration = 0.3
Sulfite residual = 80

RIG ACTIVITY

Drilled to 1448m. Flow check, well static. Circulated 2 x bottoms up. Flow check, slow seepage loss. POOH, broke circulation and worked string at 632-619m, circulated 2 x bottoms up. Continued POOH. Picked up core barrel. RIH, no problems. Cored 1448- 1455m POOH and recovered core. Picked up core barrel. RIH to 1442m, washed to bottom.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACOR 129 - 25 KG. CAN	1	64.98			
BZ-MUD DP - 25 KG. BAG	1	175.44			
PAC-L - 25 KG. BAG	1	189.83			
PAC-R - 25 KG. BAG	2	379.66			
XCD Polymer - 55 LB. BAG	2	945.52			
barite - 25 KG. SACK	51	365.16			
potassium chloride - 25 KG.	35	455.00			
potassium hydroxide - 20 KG.	3	131.85			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	110	10
Shkr #2	DFE - L/M	110	10
dSlt #1	Harrisbug	12 * 4"	10
Cent #1	DFE	70 GPM	17

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
735	376
Active Volume	
1111	
Reserve	Total
132	1243

Low Grav, vol %	4.4
ppb	40.31
High Grav, vol %	0.3
ppb	4.41
ASG	2.80
Drill Cuttings	8
Dilution Rate	2.69
Slds Control Eff	75.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION	bbl
ADDITIONS	
Oil	0
Brine Water	0
Drill Water	95
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	6
LOSSES	bbl
Dumped	0
Lost	52
VOL GAIN/LOSS	49

RHEOLOGY AND HYDRAULICS

600 rpm	50	47
300 rpm	37	35
200 rpm	32	30
100 rpm	24	23
6 rpm	10	9
3 rpm	8	7
Pressure Units:		psig
Press Drop, DP		500
Press Drop, BIT		93
Press Drop, ANN		74
Actual Circ. Press		500
AV, DP	m/min	10.4
AV, DC	m/min	14.7
AV, Riser	m/min	

FRACTURE GRADIENT

Water Depth		
Calc. F. Grad		0.0
Leak Off Test		12.0
ECD	ppg	
Csg. Shoe		9.5
TD		9.5
Max. Diff. Press		0

DEVIATION INFO

MD	1455.0	m
TVD	1303.0	m
Angle	48.80	
Direction	264.24	
Horiz. Displ	426.1	m

TIME

DRLG	1.00
CIRC	2.00
TRIPS	14.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	6.50
BACK REAM	0.00
REAMING	0.50
TESTING	0.00
OTHER	0.00
AVERAGE ROP	16.01

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 2707.44	$A 92365.60

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

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Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 21

Date	Depth
21/03/99	1472.0m [MD]
Spud Date	Present Activity
06/03/99	RIH TO CORE

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	James Murray	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 12.25" in.									
Type Corpro CM4595S									
No. Jets									
Jets sq-in									
Tot Noz Area									
TFA 1.200									

DRILLING STRING (in. / m)

Pipe OD	4 1/2	ID	3.826	Len.	1146.2				
Pipe OD	5	ID	3.000	Len.	283.3				
Pipe OD		ID		Len.					
Collar OD	8	ID	3	Len.	42.5				
Collar OD		ID		Len.					

OPEN HOLE (in. / m)

Size	17.5	Len.	135.0		
Size	12.25	Len.	833.0		
Size		Len.			
Size		Len.			
Size		Len.			

CASING

		in.	m
20	Set @	5.0	
13 3/8	Set @	504.0	
	Set @		
	Set @		
	Set @		
	Set @		
	Set @		
	Set @		

CIRCULATION DATA

Pump Make/Model	Gardner Denver				
Size 6 X 8	Eff. 97.00	V/st 0.068			
spm 80	bbl/min 5.4				
Pump Make/Model	Gardner Denver				
Size 6 X 8	Eff. 97.00	V/st 0.068			
spm 0	bbl/min 0.0				
Pump Make/Model					
Size	Eff.	V/st			
spm	bbl/min				
Tot. Vol./min 228	gpm 5.4	bbl			
BU Time 125	TC Time 200				

MUD PROPERTIES

Source	Primary: Pits, Uncr	Pits, Circ	2	3	Program Targets *=Excep P	2	3	Essential Program Properties	
Time	23:50	14:00							
FL Temp Deg C	0	39							
Depth m	1472.0	1472.0			629.1	1560.6			
Weight ppg	9.3	9.3			*	*		<	9.2
FV @ 36 Deg C sec/qt	49	53							
PV @ 49 Deg C cP	12	13						<	30
YP lbs/100 ft2	21	22							
Gels lbs/100 ft2	8/19	9/20							
API Filt. ml/30 min	6.2	6.0						6.0	8.0
HTHP @ 100 Deg C ml/30 min	18.4	18.4							
Cake API/HTHP 32nd in	1/2	1/2							
Corr.Solids % by vol	5.8	5.7							
Oil/Water % by vol	0.0/93.0	0.0/93.0							
Sand % by vol	1.25	0.8							
MBT	11.0	10.0							
pH STRIP	8.5	8.5						8.5	9.2
Alk. Mud (Pm)	0.10	0.10							
Alk. Filtr. (Pf/Mf)	0.90/0.72	0.15/0.85							
Chlorides mg/l	22000	22500							
Hard. Ca mg/l	180	220							
Low Gravity Solids ppb	52.42	52.14						<	74.00
LGS-Volume % by vol	5.8	5.7						<	8.0
6 rpm	8	9			*			10.00	15.00
KCl Content ppb	12.75	13							

MUD TREATMENTS

Commenced addition of BARACARB bridging agent (grades 25 and 100 as programmed). Weight increased to 9.3
Sand content of 1.25% = 0.75% BARACARB, 0.5% drill solids.
Ran centrifuge while tripping to reduce solids and sand content.

Barite on location 764 sx
K+ % by volume = 3.6
PHPA concentration = 0.3
Sulfite residual = 80

RIG ACTIVITY

Washed/reamed to 1455m. Circulated bottoms up. Cut core from 1455 - 1463.3m. POOH and recovered core. Made up core barrel and RIH, washed last 3 singles to bottom. Cut core from 1463.3 - 1472m. POOH and recovered core. Made up core barrel. RIH to 477m. Slipped and cut drill line. Continued RIH to 1461m.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACARB 25 - 25 KG. BAG	60	639.00			
BARACARB 100 - 25 KG. BAG	60	713.40			
BARACOR 129 - 25 KG. CAN	1	64.98			
barite - 25 KG. SACK	65	465.40			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	110	13
Shkr #2	DFE - L/M	110	13
dSlt #1	Harrisbug	12 * 4"	13
Cent #1	DFE	70 GPM	24

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
743	344
Active Volume	
1087	
Reserve	Total
70	1157

Low Grav. vol %	5.8
ppb	52.42
High Grav. vol %	0.0
ppb	0.00
ASG	2.70
Drill Cuttings	8
Dilution Rate	0.00
Slds Control Eff	75.00

MUD TYPE

KCL/ES MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	0
Sea Water	0
Whole Mud	0
Barite	2
Chemicals	7
LOSSES	bbl
Dumped	20
Lost	75
VOL GAIN/LOSS	-86

RHEOLOGY AND HYDRAULICS

600 rpm	45	48
300 rpm	31	35
200 rpm	26	30
100 rpm	20	23
6 rpm	8	9
3 rpm	6	7

Pressure Units:	psig
Press Drop, DP	4
Press Drop, BIT	30
Press Drop, ANN	0
Actual Circ. Press	280
AV, DP m/min	6.0
AV, DC m/min	19.8
AV, Riser m/min	

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	12.0
ECD ppg	
Csg. Shoe	9.2
TD	9.2
Max. Diff. Press	0

DEVIATION INFO

MD	1472.0 m
TVD	264.4 m
Angle	48.80
Direction	264.24
Horiz. Displ	431.6 m

TIME

DRLG	0.00
CIRC	0.50
TRIPS	13.50
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	9.50
BACK REAM	0.00
REAMING	0.50
TESTING	0.00
OTHER	1.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 1882.78	$A 94248.38

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 150

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 22

Date	Depth
22/03/99	1560.0m [MD]
Spud Date	Present Activity
06/03/99	CIRCULATING HOLE

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	James Murray	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 12.25" in.
Type Security SRA03D
No. Jets
Jets 32nd inch
18 | 18 | 18
Tot Noz Area
TFA

DRILLING STRING (in. / m)

Pipe OD	4 1/2	ID	3.826	Len.	1234.2
Pipe OD	5	ID	3.000	Len.	283.3
Pipe OD		ID		Len.	
Collar OD	8	ID	3	Len.	42.5
Collar OD		ID		Len.	

OPEN HOLE (in. / m)

Size	17.5	Len.	135.0
Size	12.25	Len.	921.0
Size		Len.	
Size		Len.	
Size		Len.	

CASING

20	Set @	5.0	
13 3/8	Set @	504.0	
	Set @		
	Set @		
	Set @		
	Set @		
	Set @		

CIRCULATION DATA

Pump Make/Model	Gardner Denver				
Size	6 X 8	Eff.	97.00	V/at	0.068
gpm	136	bbl/min	9.2		
Pump Make/Model	Gardner Denver				
Size	6 X 8	Eff.	97.00	V/at	0.068
gpm	136	bbl/min	9.2		
Pump Make/Model					
Size		Eff.		V/at	
gpm		bbl/min			
Tot. Vol./min	776	gpm	18.5	bbl	
BU Time	39	TC Time	64		

MUD PROPERTIES

		Primary	2	3	Program Targets *=Excep			Essential Program Properties	
Source		Pits, Circ	Pits, Circ						
Time		23:55	15:00						
FL Temp	Deg C	49	39						
Depth	m	1560.0	1495.0		P	2	3	629.1	1560.6
Weight	ppg	9.2	9.2					<	9.2
FV @ 37 Deg C	sec/qt	49	52						
PV @ 49 Deg C	cP	11	12					<	30
YP	lbs/100 ft2	19	17						
Gels	lbs/100 ft2	7/22	7/18						
API Filt.	ml/30 min	5.7	6.2		*			6.0	8.0
HTHP @ 100 Deg C	ml/30 min	18.2	18.2						
Cake API/HTHP	32nd in	1/2	1/2						
Corr.Solids % by vol		5.2	5.2						
Oil/Water % by vol		0.0/93.5	0.0/93.5						
Sand % by vol		0.5	0.5						
MBT		11.0	11.0						
pH STRIP		8.5	8.5					8.5	9.2
Alk. Mud (Pm)		0.08	0.00						
Alk. Filtr. (Pf/Mf)		0.07/0.88	0.08/0.90						
Chlorides mg/l		23500	23000						
Hard. Ca mg/l		220	240						
Low Gravity Solids ppb		47.05	47.32					<	74.00
LGS Volume	% by vol	5.2	5.2					<	8.0
6 rpm		8	7		*			10.00	15.00
KCl Content	ppb	12.5	12.25						

MUD TREATMENTS

Mud weight down to 9.2, MBT decreased affected low end rheology, added XCD polymer to maintain YP and 6 rpm.
Ran centrifuge during trips.
Treated with KOH and BARACIDE prior to logging and running casing.
Pumped LCM pill (10 ppb Kwik Seal) to flush hole at TD, some increase in cuttings.
Barite on location 764 sx
K+ % volume = 3.5
PHPA concentration = 0.35
Sulfite residual = 60

RIG ACTIVITY

Washed/reamed 1461-1472m, 4m fill. Cored 1472 -1478m. POOH, recovered core. RIH with bit. Reamed 1445 - 1478m, drilled ahead to 1560m. Pumped LCM pill, circulated hole clean.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACARB 25 - 25 KG. BAG	65	692.25	potassium chloride - 25 KG.	40	520.00
BARACARB 100 - 25 KG. BAG	65	772.85	potassium hydroxide - 20 KG.	5	219.75
BARACIDE - 25 KG. CAN	2	362.88			
BARACOR 129 - 25 KG. CAN	2	129.96			
SZ-MUD DP - 25 KG. BAG	2	350.88			
Kwikseal Medium - 40 LB. BAG	10	437.10			
PAC-L - 25 KG. BAG	2	379.66			
PAC-R - 25 KG. BAG	2	379.66			
XCD Polymer - 55 LB. BAG	5	2363.80			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	110	15
Shkr #2	DFE - L/M	110	15
dSlt #1	Harrisbug	12 * 4"	15
Cent #1	DFE	70 GPM	24

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
794	402
Active Volume	
1186	
Reserve	Total
27	1213

Low Grav. vol % 5.2
ppb 47.05
High Grav. vol % 0.0
ppb 0.00
ASG 2.63
Drill Cuttings 42
Dilution Rate 0.49
Slds Control Eff 75.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	95
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	13
LOSSES	bbl
Dumped	0
Lost	52
VOL GAIN/LOSS	56

RHEOLOGY AND HYDRAULICS

600 rpm	41	41
300 rpm	30	29
200 rpm	25	24
100 rpm	19	18
6 rpm	8	7
3 rpm	7	6
Pressure Units:		psig
Press Drop, DP		1674
Press Drop, BIT		911
Press Drop, ANN		64
Actual Circ. Press		2050
AV, DP	m/min	20.3
AV, DC	m/min	67.4
AV, Riser	m/min	

FRACTURE GRADIENT

Water Depth		
Calc. F. Grad		0.0
Leak Off Test		12.0
ECD	ppg	
Csg. Shoe		9.4
TD		9.4
Max. Diff. Press		0

DEVIATION INFO

MD	1560.0	m
TVD	1369.7	m
Angle	48.80	
Direction	264.2	
Horiz. Displ	502.3	m

TIME

DRLG	9.50
CIRC	1.00
TRIPS	8.00
SERV. RIG	1.50
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	2.50
BACK REAM	0.00
REAMING	1.50
TESTING	0.00
OTHER	0.00
AVERAGE ROP	9.26

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 6608.79	$A 100857.17

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 23

Date	Depth
23/03/99	1560.0m [MD]
Spud Date	Present Activity
06/03/99	WIPER TRIP

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman /Ian Zurakowski	James Murray	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 12.25" in.
Type Security SRA03D
No. Jets
Jets 32nd inch
18 | 18 | 18
Tot Noz Area
TFA

DRILLING STRING (in. / m)

Pipe OD 4 1/2 ID 3.826 Len. 1150.5
Pipe OD 5 ID 3.000 Len. 283.3
Pipe OD ID Len.
Collar OD 8 ID 3 Len. 33.2
Collar OD ID Len.

OPEN HOLE (in. / m)

Size 17.5 Len. 135.0
Size 12.25 Len. 921.0
Size Len.
Size Len.
Size Len.

CASING

in. m
20 Set @ 5.0
13 3/8 Set @ 504.0
Set @
Set @
Set @
Set @
Set @
Set @

CIRCULATION DATA

Pump Make/Model Gardner Denver
Size 6 X 8 Eff. 97.00 V/st 0.068
gpm 0 bbl/min 0.0
Pump Make/Model Gardner Denver
Size 6 X 8 Eff. 97.00 V/st 0.068
gpm 0 bbl/min 0.0
Pump Make/Model
Size Eff. V/st
gpm bbl/min
Tot. Vol./min 0 gpm 0.0 bbl
BU Time 0 TC Time 0

MUD PROPERTIES

		Primary	2	3	Program Targets *=Excep	Essential Program Properties
Source		Pits, Circ				
Time		23:50				
FL Temp	Deg C	39				
Depth	m	1560.0			P 2 3	629.1 1560.6
Weight	ppg	9.2				< 9.2
FV @ 37 Deg C	sec/qt	46				
PV @ 49 Deg C	cP	11				< 30
YP	lbs/100 ft2	16				
Gels	lbs/100 ft2	6/18				
API Filt.	ml/30 min	6.2				6.0 8.0
HTHP @ 100 Deg C	ml/30 min	18.8				
Cake API/HTHP	32nd in	1/2				
Corr.Solids % by vol		5.2				
Oil/Water % by vol		0.0/93.5				
Sand % by vol		0.75				
MBT		12.0				
pH STRIP		8.5				8.5 9.2
Alk. Mud (Pm)		0.00				
Alk. Filtr. (Pf/Mf)		0.08/1.00				
Chlorides mg/l		23500				
Hard. Ca mg/l		180				
Low Gravity Solids ppb		47.05				< 74.00
LGS Volume	% by vol	5.2				< 8.0
6 rpm		6			*	10.00 15.00
KCl Content	ppb	12.8				

MUD TREATMENTS

Error in mud losses reported yesterday, actual losses higher. Mud loss of 93 bbls includes correction for losses on 22/03/99. Increase in MBT due to increased silt, sand content increased to 0.75% due to silt. Silt particles have little effect on viscosity.

Barite on location 732 sacks
K+ % by volume = 3.67
PHPA concentration = 0.25

RIG ACTIVITY

Circulated hole clean. Survey. POOH to log, pumped out of tight hole from 1520 - 1440m.
Ran Schlumberger logs :
Run #1 - PEX PSI
Run #2 - SAT (unsuccessful)
Made up bit and BHA. RIH for wiper trip.
Washed/reamed tight hole from 1455 -1467m

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACARB 25 - 25 KG. BAG	31	330.15			
BARACARB 100 - 25 KG. BAG	29	344.81			
PAC-R - 25 KG. BAG	1	189.83			
XCD Polymer - 55 LB. BAG	1	472.76			
barite - 25 KG. SACK	32	229.12			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	110	2
Shkr #2	DFE - L/M	110	2
dSlt #1	Harrisbug	12 * 4"	
Cent #1	DFE	70 GPM	7

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
787	276
Active Volume	
1063	
Reserve	Total
27	1090

Low Grav. vol % 5.2
ppb 47.05
High Grav. vol % 0.0
ppb 0.00
ASG 2.63
Drill Cuttings 0
Dilution Rate 0.00
Slds Control Eff 75.00

MUD TYPE

KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	0
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	0
LOSSES	bbl
Dumped	30
Lost	93
VOL GAIN/LOSS	-123

RHEOLOGY AND HYDRAULICS

600 rpm 38
300 rpm 27
200 rpm 23
100 rpm 17
6 rpm 6
3 rpm 5
Pressure Units: psig
Press Drop, DP 0
Press Drop, BIT 0
Press Drop, ANN 0
Actual Circ. Press 0
AV, DP m/min 0.0
AV, DC m/min 0.0
AV, Riser m/min

FRACTURE GRADIENT

Water Depth
Calc. F. Grad 0.0
Leak Off Test 12.0
ECD ppg
Csg. Shoe 9.2
TD 9.2
Max. Diff. Press 0

DEVIATION INFO

MD	1560.0	m
TVD	1369.7	m
Angle	48.80	
Direction	264.2	
Horiz. Displ	502.3	m

TIME

DRLG	0.00
CIRC	0.50
TRIPS	11.00
SERV. RIG	0.00
SURVEY	0.50
FISHING	0.00
LOGGING	12.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	0.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 1566.67	$A 102423.84

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 24

Date	Depth
24/03/99	1560.0m [MD]
Spud Date	Present Activity
06/03/99	RUN CASING

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman /Ian Zurakowski	James Murray	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size 12.25" in.
Type
No. Jets
Jets 32nd inch
Tot Noz Area
TFA

DRILLING STRING (in. / m)

Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Pipe OD	ID	Len.	
Collar OD	ID	Len.	
Collar OD 9.625	ID 8.9375	Len. 1557.0	

OPEN HOLE (in. / m)

Size 17.5	Len. 135.0		
Size 12.25	Len. 921.0		
Size	Len.		
Size	Len.		
Size	Len.		

CASING

	in.	m
20	Set @	5.0
13 3/8	Set @	504.0
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
gpm 0	bbl/min	0.0	
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
gpm 0	bbl/min	0.0	
Pump Make/Model			
Size	Eff.	V/at	
gpm	bbl/min		
Tot. Vol./min 0	gpm	0.0	bbl
BU Time 0	TC Time	0	

MUD PROPERTIES

		Primary	2	3	Program Targets *=Excep P	2	3	Essential Program Properties	
Source		Pits, Circ							
Time		01:30							
FL Temp	Deg C	39							
Depth	m	1560.0						629.1	1560.6
Weight	ppg	9.2						<	9.2
FV @ 37 Deg C	sec/qt	46							
PV @ 49 Deg C	cP	11						<	30
YP	lbs/100 ft2	16							
Gels	lbs/100 ft2	6/18							
API Filt.	ml/30 min	6.2						6.0	8.0
HTHP @ 100 Deg C	ml/30 min	0.0							
Cake API/HTHP	32nd in	1/0							
Corr.Solids % by vol		5.2							
Oil/Water % by vol		0.0/93.5							
Sand % by vol		0.75							
MBT		12.0							
pH STRIP		8.5						8.5	9.2
Alk. Mud (Pm)		0.10							
Alk. Filtr. (Pf/Mf)		0.08/0.98							
Chlorides mg/l		23500							
Hard. Ca mg/l		180							
Low Gravity Solids ppb		47.05						<	74.00
LGS Volume	% by vol	5.2						<	8.0
6 rpm		6			*			10.00	15.00
KCl Content	ppb	12.75							

MUD TREATMENTS

Lost mud while running casing, casing filled up and overflowed while running last 2m or so on each joint. Recovered some volume from cellar back to pits. Minor seepage losses downhole (< 1 bbl/hr)
Dumped and cleaned premix tank, used to prepare cement mix water. Dumped and flushed slug pit.

RIG ACTIVITY

Reamed 1455 - 1562m; 9m of fill on bottom. Circulated hole, 2 x bottoms up. POOH, pumped out of tight hole from 1520 - 1455m. Ran 9-5/8" casing to 1557m.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACARB 25 - 25 KG. BAG	20	213.00			
BARACARB 100 - 25 KG. BAG	20	237.80			
barite - 25 KG. SACK	35	250.60			
potassium hydroxide - 20 KG.	2	87.90			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE - L/M	110	2
Shkr #2	DFE - L/M	110	2
dSlt #1	Harrisbug	12 * 4"	
Cent #1	DFE	70 GPM	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
764	210
Active Volume	
974	
Reserve	Total
	974

Low Grav. vol % 5.2
ppb 47.05
High Grav. vol % 0.0
ppb 0.00
ASG 2.63
Drill Cuttings 0
Dilution Rate 0.00
Slds Control Eff 75.00

MUD TYPE

KCL/EZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	0
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	0
LOSSES	bbl
Dumped	20
Lost	96
VOL GAIN/LOSS	-116

RHEOLOGY AND HYDRAULICS

600 rpm	38
300 rpm	27
200 rpm	23
100 rpm	17
6 rpm	6
3 rpm	5
Pressure Units:	psig
Press Drop, DP	0
Press Drop, BIT	0
Press Drop, ANN	0
Actual Circ. Press	0
AV, DP m/min	0.0
AV, DC m/min	0.0
AV, Riser m/min	

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	12.0
ECD ppg	
Csg. Shoe	0.0
TD	0.0
Max. Diff. Press	0

DEVIATION INFO

MD	1560.0 m
TVD	1369.7 m
Angle	48.80
Direction	264.2
Horiz. Displ	502.3 m

TIME

DRLG	9.00
CIRC	0.00
TRIPS	6.50
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	15.00
CORE	0.00
BACK REAM	0.00
REAMING	2.00
TESTING	0.00
OTHER	0.50
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	SA 789.30	SA 103213.14

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

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Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 25

Date	Depth
25/03/99	1558.0m [MD]
Spud Date	Present Activity
06/03/99	RUN VSP LOG

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	James Murray	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA	DRILLING STRING	CASING	CIRCULATION DATA
Size in.	Pipe OD ID Len.		Pump Make/Model Gardner Denver
Type	Pipe OD ID Len.	in. m	Size 6 X 8 Eff. 97.00 V/st 0.068
No. Jets	Pipe OD ID Len.	20 Set @ 5.0	spm 0 bbl/min 0.0
Jets 32nd inch	Collar OD ID Len.	13 3/8 Set @ 504.0	Pump Make/Model Gardner Denver
	Collar OD ID Len.	9 5/8 Set @ 1558.0	Size 6 X 8 Eff. 97.00 V/st 0.068
	in. OPEN HOLE m	Set @	spm 0 bbl/min 0.0
Tot Noz Area	Size Len.	Set @	Pump Make/Model
TFA	Size Len.	Set @	Size Eff. V/st
	Size Len.	Set @	spm bbl/min
	Size Len.	Set @	Tot. Vol./min 0 gpm 0.0 bbl
	Size Len.	Set @	BU Time 0 TC Time 0

MUD PROPERTIES

	Primary	2	3	Program Targets *=Excep P	2	3	Essential Program Properties
Source	Other						
Time	23:45						
FL Temp Deg C	0						
Depth m	1560.0						
Weight ppg	0.0						
FV @ 16 Deg C sec/qt	0						
PV @ 49 Deg C cP	1						
YP lbs/100 ft2	0						
Gels lbs/100 ft2	0/0						
API Filt. ml/30 min	0.0						
HTHP @ 100 Deg C ml/30 min	0.0						
Cake API/HTHP 32nd in	2/0						
Corr.Solids % by vol	0.0						
Oil/Water % by vol	0.0/0.0						
Sand % by vol							
MBT	0.0						
pH STRIP	0.0						
Alk. Mud (Pm)	0.00						
Alk. Filtr. (Pf/Mf)	0.00/0.00						
Chlorides mg/l	0						
Hard. Ca mg/l	0						
Low Gravity Solids ppb	0.00						
LGS Volume % by vol	0.0						
6 rpm	0						
KCl Content ppb							

MUD TREATMENTS

Displaced with water during cementing of 9-5/8" casing, no mud left in hole. Dumped approximately 20 bbls of cement contaminated mud, phenolpthalein indicated pH increase but no other evidence of contamination. Salvaged 400 bbls to storage tank, transferred 473 bbls to sump for next well; to use salvaged mud to spud next well. Dump remaining mud in its. Cleaned pits. Carting clean water in preparation to mix 8.6 ppg KCl completion brine.

RIG ACTIVITY

Circulated hole clean. Cemented 9-5/8" casing. Installed hanger and landed off casing. Cut casing, installed B-section and nippled up. Ran Schlumberger CBL log, followed by VSP log.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACIDS - 25 KG. CAN	1	181.44			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFS - L/M	110	5
Shkr #2	DFS - L/M	110	5
dSlt #1	Harrisbug	12 * 4"	
Cent #1	DFS	70 GPM	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
388	0

Active Volume 388

Reserve	Total
	388

Low Grav. vol % 0.0
ppb 0.00
High Grav. vol % 0.0
ppb 0.00
ASG
Drill Cuttings 0
Dilution Rate 0.00
Slds Control Eff 75.00

MUD TYPE: KCL/SZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	388
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	0
LOSSES	bbl
Dumped	102
Lost	873
VOL GAIN/LOSS	-587

RHEOLOGY AND HYDRAULICS

600 rpm	
300 rpm	
200 rpm	
100 rpm	
6 rpm	
3 rpm	
Pressure Units:	psig
Press Drop. DP	0
Press Drop. BIT	0
Press Drop. ANN	0
Actual Circ. Press	0
AV. DP m/min	0.0
AV. DC m/min	0.0
AV. Riser m/min	

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	12.0
ECD ppg	
Csg. Shoe	0.0
TD	0.0
Max. Diff. Press	0

DEVIATION INFO

MD	1558.0 m
TVD	1369.7 m
Angle	48.80
Direction	264.2
Horiz. Displ	502.3 m

TIME

DRLG	0.00
CIRC	1.50
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	7.50
RUN CSG	5.50
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	9.50
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 181.44	$A 103394.58

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT
(Cost Modified)

REPORT NUMBER: 26

Date	Depth
26/03/99	1558.0m [MD]
Spud Date	Present Activity
06/03/99	LAY OUT PIPE

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	James Murray	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size	in.
Type	
No. Jets	
Jets 32nd inch	
Tot Noz Area	
TFA	

DRILLING STRING

	Pipe OD	ID	Len.	
	Pipe OD	ID	Len.	
	Pipe OD	ID	Len.	
	Collar OD	ID	Len.	
	Collar OD	ID	Len.	

OPEN HOLE

in.	Size	Len.
	Size	Len.
	Size	Len.
	Size	Len.
	Size	Len.

CASING

	in.	m
	20	Set @ 5.0
	13 3/8	Set @ 504.0
	9 5/8	Set @ 1558.0
		Set @
		Set @
		Set @
		Set @
		Set @

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
gpm 0	bbl/min	0.0	
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/at	0.068
gpm 0	bbl/min	0.0	
Pump Make/Model			
Size	Eff.	V/at	
gpm	bbl/min		
Tot. Vol./min 0	gpm 0.0	bbl	
BU Time 0	TC Time 0		

MUD PROPERTIES

		Primary	2	3	Program Targets *=Except			Essential Program Properties	
Source		Pits, Uncr							
Time		12:00							
FL Temp	Deg C	0							
Depth	m	1558.0						629.1	1560.6
Weight	ppg	8.6						<	9.2
FV @ 16 Deg C	sec/qt	28							
PV @ 49 Deg C	cP	1						<	30
YP	lbs/100 ft2	0							
Gels	lbs/100 ft2	0/0							
API Filt	ml/30 min	0.0			*			6.0	8.0
HTHP @ 100 Deg C	ml/30 min	0.0							
Cake API/HTHP	32nd in	0/0							
Corr Solids % by vol		0.0							
Oil/Water % by vol		0.0/0.0							
Sand % by vol									
MBT		0.0							
pH STRIP		0.0			*			8.5	9.2
Alk. Mud (Pm)		0.00			*				
Alk. Filtr. (Pf/Mf)		0.00/0.00							
Chlorides mg/l		25000							
Hard. Ca mg/l		0							
Low Gravity Solids	ppb	0.00						<	74.00
LGS Volume	% by vol	0.0						<	8.0
6 rpm		0			*			10.00	15.00
KCl Content	ppb	19.5							

MUD TREATMENTS

Mixed8.6ppg KCL brine, treated with COAT 2748. Displacewaterfrom hole with inhibited brine.

RIG ACTIVITY

Completed Schlumberger logs. Pressure tested BOP. RIH with scraper. Displaced hole to inhibited brine. POOH, laying out drill pipe.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
Coat-2748 - 208 L. DRUM	2	1700.00			
KCL - Tech. - 25 KG. SACK	153	2146.59			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFS - L/M	110	
Shkr #2	DFS - L/M	110	
dSlt #1	Harrisbug	12 * 4"	
Cent #1	DFS	70 GPM	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
388	40

Active Volume 428

Reserve	Total
	428

Low Grav. vol %	0.0
ppb	0.00
High Grav. vol %	0.0
ppb	0.00
ASG	
Drill Cuttings	0
Dilution Rate	0.00
Slds Control Eff	75.00

MUD TYPE

KCL BRINE

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	450
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	12
LOSSES	bbl
Dumped	388
Lost	34
VOL GAIN/LOSS	40

RHEOLOGY AND HYDRAULICS

600 rpm		
300 rpm		
200 rpm		
100 rpm		
6 rpm		
3 rpm		
Pressure Units:	psig	
Press Drop. DP	0	
Press Drop. BIT	0	
Press Drop. ANN	0	
Actual Circ. Press	0	
AV. DP m/min	0.0	
AV. DC m/min	0.0	
AV. Riser m/min		

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	12.0
ECD ppg	
Csg. Shoe	0.0
TD	0.0
Max. Diff. Press	0

DEVIATION INFO

MD	1558.0 m
TVD	1369.7 m
Angle	48.80
Direction	264.2
Horiz. Displ	502.3 m

TIME

DRLG	0.00
CIRC	0.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	24.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 3846.59	$A 107241.17

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 155

Baroid Australia Pty Ltd
DRILLING MUD REPORT
(Cost Modified)

REPORT NUMBER: 27

Date	Depth	
27/03/99	1558.0m	(MD)
Spud Date	Present Activity	
06/03/99	LAY OUT PIPE	

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	James Murray	Victoria
WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA / COUNTRY
IONA-4	PPL 2	Otway Basin / Austral

BIT DATA

Size	in.		
Type			
No Jets			
Jets 32nd inch			
Tot Noz Area			
TFA			

DRILLING STRING

	in.	m		
Pipe OD		ID		Len.
Pipe OD		ID		Len.
Pipe OD		ID		Len.
Collar OD		ID		Len.
Collar OD		ID		Len.

OPEN HOLE

in.	m		
Size			Len.
Size			Len.
Size			Len.
Size			Len.

CASING

	in.	m
20	Set @	5.0
13 3/8	Set @	504.0
9 5/8	Set @	1558.0
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	

CIRCULATION DATA

Pump Make/Model	Gardner Denver				
Size	6 X 8	Eff.	97.00	V/pt	0.068
gpm	0	bbl/min	0.0		
Pump Make/Model	Gardner Denver				
Size	6 X 8	Eff.	97.00	V/pt	0.068
gpm	0	bbl/min	0.0		
Pump Make/Model					
Size		Eff.		V/pt	
gpm		bbl/min			
Tot. Vol./min	0	gpm	0.0	bbl	
BU Time	0	TC Time	0		

MUD PROPERTIES

		Primary	2	3	Program Targets **Except	Essential Program Properties	
Source		Pits, Unch					
Time		23:45					
FL Temp	Deg C	0					
Depth	m	1558.0			P 2 3	629.1	1560.6
Weight	ppg	8.5				<	9.2
FV @ 16 Deg C	sec/qt	28					
PV @ 49 Deg C	cP	1				<	30
YP	lbs/100 ft2	0					
Gels	lbs/100 ft2	0/0					
API Filt.	ml/30 min	0.0			•	6.0	8.0
HTHP @ 100 Deg C	ml/30 min	0.0					
Cake API/HTHP	32nd in	2/0					
Corr.Solids % by vol		0.0					
Oil/Water % by vol		0.0/0.0					
Sand % by vol							
MBT		0.0					
pH STRIP		0.0			•	8.5	9.2
Alk. Mud (Pm)		0.00					
Alk. Filtr. (Pf/Mf)		0.00/0.00					
Chlorides mg/l		25000					
Hard Ca mg/l		0					
Low Gravity Solids	ppb	0.00				<	74.00
LGS Volume	% by vol	0.0				<	8.0
6 rpm		9			•	10.00	15.00
KCl Content	ppb	19					

MUD TREATMENTS

Mixed additional KCl brine to fill tubing while RIH.
"Mud lost" includes dead volume in pits plus mud displaced by tubing when running in (end of tubing closed)

RIG ACTIVITY

Ran 5-1/2" tubing. Made up test tree and equipment. Pressure test.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
HCL - Tech. - 25 KG. SACK	32	448.96			
potassium chloride - 25 KG.	40	520.00			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFS - L/M	110	
Shkr #2	DFS - L/M	110	
dSlt #1	Harrisbug	12 * 4?	
Cent #1	DFS	70 GPM	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
388	60
Active Volume	
448	
Reserve	Total
	448

Low Grav. vol %	0.0		
ppb	0.00		
High Grav. vol %	0.0		
ppb	0.00		
ADD			
Drill Cuttings	0		
Dilution Rate	0.00		
Slds Control Eff	75.00		

MUD TYPE

KCL BRINE

MUD CONSUMPTION			
ADDITIONS	bbl	LOSSES	bbl
Oil	0	Dumped	0
Brine Water	0	Lost	150
Drill Water	170		
Sea Water	0		
Whole Mud	0		
Barite	0		
Chemicals	0		
VOL GAIN/LOSS	20		

RHEOLOGY AND HYDRAULICS

600 rpm			
300 rpm			
200 rpm			
100 rpm			
6 rpm			
3 rpm			
Pressure Units	psig		
Press Drop. DP	0		
Press Drop. BIT	0		
Press Drop. ANN	0		
Actual Circ. Press	0		
AV. DP m/min	0.0		
AV. DC m/min	0.0		
AV. Riser m/min			

FRACTURE GRADIENT

Water Depth			
Calc. F. Grad	0.0		
Leak Off Test	12.0		
ECD	ppg		
Csg. Shoe	0.0		
TD	0.0		
Max. Diff. Press	0		

DEVIATION INFO

MD	1558.0	m	
TVD	1369.7	m	
Angle	48.80		
Direction	264.2		
Horiz. Displ	502.3	m	

TIME

DRLG	0.00
CIRC	0.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	24.00
OTHER	0.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	$A 968.96	$A 108210.13

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 156

Baroid Australia Pty Ltd
DRILLING MUD REPORT
(Cost Modified)

REPORT NUMBER: 28

Date	Depth
28/03/99	1558.0m [MD]
Spud Date	Present Activity
06/03/99	WELL TEST OPERATIONS

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	REPORT FOR	REGION
Wally Westman /Ian Zurakowski	James Murray	Victoria
WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA
IONA-4	PPL 2	Otway Basin

COUNTRY: Austral

BIT DATA

Size	in
Type	
No Jets	
Jets 32nd inch	
Tot Nzl Area	
TFA	

DRILLING STRING

Pipe OD	ID	Len.		
Pipe OD	ID	Len.		
Pipe OD	ID	Len.		
Collar OD	ID	Len.		
Collar OD	ID	Len.		

OPEN HOLE

Size	Len.	
Size	Len.	
Size	Len.	
Size	Len.	
Size	Len.	

CASING

	in	m
20	Set @	5.0
13 3/8	Set @	504.0
9 5/8	Set @	1558.0
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size	6 X 8	Eff. 97.00	V/pt 3.268
spm	0	bbl/min	0.0
Pump Make/Model	Gardner Denver		
Size	6 X 8	Eff. 97.00	V/pt 3.268
spm	0	bbl/min	0.0
Pump Make/Model			
Size		Eff.	V/pt
spm		bbl/min	
Tot. Vol./min	0	gpm	0.0 psi
BU Time	0	TC Time	0

MUD PROPERTIES

Source	Primary: Pits, Unce	2	3	Program Targets **=Excep	Essential Program Properties	
Time	23:50					
FL Temp Deg C	0					
Depth m	1558.0			P 2 3	629.1	1560.6
Weight ppg	8.6				<	9.2
FV @ 16 Deg C sec/qt	38					
PV @ 49 Deg C cP	1					
YP lbs/100 ft2	0				<	30
Gels lbs/100 ft2	0/0					
API Filt. ml/30 min	0.0					
HTHP @ 100 Deg C ml/30 min	0.0			*	6.0	8.0
Cake API/HTHP 32nd in	0/0					
Corr.Solids % by vol	0.0					
Oil/Water % by vol	0.0/0.0					
Sand % by vol						
MBT	0.0					
pH STRIP	0.0					
Alk. Mud (Pm)	0.00			*	8.5	9.2
Alk. Filtr. (Pf/Mf)	0.00/0.00					
Chlorides mg/l	25000					
Hard. Ca mg/l	0					
Low Gravity Solids ppb	0.00					
LGS Volume % by vol	0.0				<	74.00
6 rpm	0				<	8.0
KCl Content ppb	19.5			*	10.00	15.00

MUD TREATMENTS

Prepared a further 115 bbls of 8.6 PPG brine. no corrosion inhibitor added at this time.

RIG ACTIVITY

Pressure test testing equipment. Rigged up lubricator and wireline equipment. retrieved plug. Pressure tested. RIH with wireline and opened SSD. Displaced tubing to annulus with nitrogen. Unable to close SSD. continue attempting to close SSD

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
KCL - Tech. - 25 KG. SACK	38	533.14			

SOLIDS EQUIPMENT

Device	Make	Sz, Scrn/ HP
Shkr #1	DFS - L/M	110
Shkr #2	DFS - L/M	110
dSlt #1	Harrisbue	12 + 4
Cent #1	DFS	70 GPM

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
388	175
Active Volume	
563	
Reserve	Total
	563

Low Grav. vol %	0.0
ppb	0.00
High Grav. vol %	0.0
ppb	0.00
ASG	
Drill Cuttings	0
Dilution Rate	0.00
Slds Control Eff	75.00

MUD TYPE

KCL BRINE

MUD CONSUMPTION	bbl
ADDITIONS	
Oil	0
Brine Water	0
Drill Water	113
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	2
LOSSES	bbl
Dumped	0
Lost	0
VOL GAIN/LOSS	115

RHEOLOGY AND HYDRAULICS

600 rpm	
300 rpm	
200 rpm	
100 rpm	
6 rpm	
3 rpm	
Pressure Units:	psig
Press Drop. DP	0
Press Drop. BIT	0
Press Drop. ANN	0
Actual Circ. Press	0
AV. DP m/min	0.0
AV. DC m/min	0.0
AV. Riser m/min	

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	12.0
ECD ppg	
Csg. Shoe	0.0
TD	0.0
Max. Diff. Press	0

DEVIATION INFO

MD	1558.0 m
TVD	1369.7 m
Angle	48.80
Direction	264.2
Horiz. Displ	502.3 m

TIME

DRLG	0.00
CIRC	0.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	24.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 96213311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 56881445	OA 533.14	OA 108743.27

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 157

Baroid Australia Pty Ltd
DRILLING MUD REPORT
(Cost Modified)

REPORT NUMBER: 29

Date	Depth	Spud Date	Present Activity
29/03/99	1558.0m (MD)	06/03/99	RERUN TUBING

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman / Jack Lambert	James Murray	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA / DRILLING STRING / CASING / CIRCULATION DATA

BIT DATA	DRILLING STRING (in. / m)			CASING (in. / m)	CIRCULATION DATA	
Size in	Pipe OD	ID	Len.		Pump Make Model Gardner Denver	
Type	Pipe OD	ID	Len.	in. m	Size 6 X 8	Eff. 97.00 V/st [illegible]
No Jets	Pipe OD	ID	Len	20 Set @ 5.0	spm 0	bbl/min 0.0
Jets 32nd inch	Collar OD	ID	Len	13 3/8 Set @ 504.0	Pump Make Model Gardner Denver	
	Collar OD	ID	Len.	9 5/8 Set @ 1558.0	Size 6 X 8	Eff. 97.00 V/st [illegible]
	OPEN HOLE (in. / m)			Set @	spm 0	bbl/min 0.0
Tot Noz Area	Size		Len.	Set @	Pump Make Model	
TFA	Size		Len.	Set @	Size	Eff. V/st
	Size		Len.	Set @	spm	bbl/min
	Size		Len.	Set @	Tot. Vol /min 0 gpm	0.0 bbl
	Size		Len.	Set @	BU Time 0	TC Time 0

MUD PROPERTIES

		Primary	2	3	Program Targets *=Excep	Essential Program Properties
Source		Pits, Uncl				
Time		21:00				
FL Temp	Deg C	0				
Depth	m	1558.0			P 2 3	629.1 1560.5
Weight	ppg	8.6				< 9.2
FV @ 15 Deg C	sec qt	28				
PV @ 49 Deg C	cP	1				< 10
YP	lbs 100 ft2	0				
Gels	lbs 100 ft2	0/0				
API Filt.	ml/30 min	0.0			*	6.0 8.0
HTHP @ 100 Deg C	ml 30 min	0.0				
Cake API/HTHP	32nd in	0/0				
Corr Solids % by vol		0.0				
Oil/Water % by vol		0.0/0.0				
Sand % by vol						
MBT		0.0				
pH STRIP		0.0			*	8.5 9.2
Alk. Mud (Pm)		0.00				
Alk. Filtr (Pf/Mf)		0.00/0.00				
Chlorides mg/l		25000				
Hard. Ca mg/l		0				
Low Gravity Solids ppb		0.00				< [illegible]
LGS Volume	% by vol	0.0				< 8.0
6 rpm		0			*	10.00 15.00
KCl Content	ppb	19.5				

MUD TREATMENTS

Mixed additional brine to ensure adequate volume to reverse circulate tubing before pulling tubing.
Reverse circulated brine back to pits

RIG ACTIVITY

Attempted to SSD, no success. Set X plug and rigged down wireline unit, lubricator and test tree. Pulled tubing out of hanger and broke out of packer. Reverse circulated tubing volume plus 20%. POOH with 5-1/2" tubing. Cleaned and inspected tubing and tools. Laid out SSD. Slipped and cut drill line. Rerun tubing

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
KCl - Tech - 25 KG SACK	40	561.20			

SOLIDS EQUIPMENT

Device	Make	Sc/Scrn/Hr
Shkr #1	DFE - L/M	110
Shkr #2	DFE - L/M	110
dSlt #1	Harrisburg	12 * 4"
Cent #1	DFE	70 GPM

MUD MANAGEMENT

MUD VOLUME bbl		MUD TYPE		RHEOLOGY AND HYDRAULICS	
Hole	Pits	KCL BRINE		600 rpm	
188	331	MUD CONSUMPTION		300 rpm	
Active Volume		ADDITIONS	bbl	200 rpm	
448		Oil	0	100 rpm	
Reserve	Total	Brine Water	0	6 rpm	
	448	Drill Water	110	3 rpm	
Low Grav vol %	[illegible]	Sea Water	0	Pressure Units	psig
ppb	0.00	Whole Mud	0	Press Drop DP	0
High Grav vol %	[illegible]	Barite	0	Press Drop. BIT	0
ppb	0.00	Chemicals	2	Press Drop. ANN	0
SCE		LOSSES	bbl	Actual Circ Press	0
Drill Cuttings	0	Dumped	0	AV. DP m/min	0.0
Dilution Rate	0.00	Lost	7	AV. DC m/min	0.0
Sldo Control Eff	70.00	VOL GAIN/LOSS	105	AV. Riser m/min	

FRACTURE GRADIENT

Water Depth	
Calc F Grad	0.0
Leak Off Test	10.0
ECD ppg	
Csg Shoe	0.0
TD	0.0
Max Diff. Press	0

DEVIATION INFO

MD	1558.0 m
TVD	1369.7 m
Angle	48.80
Direction	264.2
Horiz. Displ	502.3 m

TIME

DRLG	0.00
CIRC	0.00
TRIPS	0.00
SERV RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	24.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE HOME	Melbourne	TELEPHONE 03 9621 3111	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Warrnambool	TELEPHONE 03 5688 1445	$A 561.20	$A 109104.47

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 158

Baroid Australia Pty Ltd
DRILLING MUD REPORT
(Cost Modified)

REPORT NUMBER: 30

Date	Depth
30/03/99	1558.0m [MD]
Spud Date	Present Activity
06/03/99	KILL WELL

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman / Jack Lambert	James Murray	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size	in.		
Type			
No. Jets			
Jets 32nd inch			
Tot Noz Area			
TFA			

DRILLING STRING

	in.	OPEN HOLE		m
Pipe OD	ID	Len.		
Pipe OD	ID	Len.		
Pipe OD	ID	Len.		
Collar OD	ID	Len.		
Collar OD	ID	Len.		
Size		Len.		
Size		Len.		
Size		Len.		
Size		Len.		

CASING

	in.		m
20	Set @		5.0
13 3/8	Set @		504.0
9 5/8	Set @		1558.0
	Set @		
	Set @		
	Set @		
	Set @		

CIRCULATION DATA

Pump Make/Model		Gardner Denver	
Size 6 X 8	Eff.	97.00	V/gt 0.066
gpm 0	bbl/min		0.0
Pump Make/Model		Gardner Denver	
Size 6 X 8	Eff.	97.00	V/gt 0.066
gpm 0	bbl/min		0.0
Pump Make/Model			
Size	Eff.		V/gt
gpm	bbl/min		
Tot. Vol./min 0	gpm	0.0	bbl
BU Time 0	TC Time		0

MUD PROPERTIES

Source	Primary: Pits, Under	2	3	Program Targets *=Excep	Essential Program Properties
Time	23:00				
FL Temp Deg C	0				
Depth m	1558.0			P 2 3	629.1 1560.6
Weight ppg	8.6				< 9.2
FV @ 16 Deg C sec/qt	28				
PV @ 49 Deg C cP	1				< 30
YP lbs/100 ft2	0				
Gels lbs/100 ft2	0/0				
API Filt. ml/30 min	0.0			*	6.0 8.0
MTHP @ 100 Deg C ml/30 min	0.0				
Cake API/MTHP 32nd in	2/0				
Corr.Solids % by vol	0.0				
Oil/Water % by vol	0.0/0.0				
Sand % by vol					
MBT	0.0				
pH STRIP	0.0			*	8.5 9.2
Alk. Mud (Pm)	0.00				
Alk. Filtr. (Pf/Mf)	0.00/0.00				
Chlorides mg/l	24500				
Hard. Ca mg/l	0				
Low Gravity Solids ppb	0.00				< 74.00
LGS Volume % by vol	0.0				< 8.0
6 rpm	0			*	10.00 15.00
KCl Content ppb	19				

MUD TREATMENTS

No mud treatment made.

RIG ACTIVITY

Continued running 5-1/2" tubing. Displaced tubing to annulus with nitrogen as. Made up and pressure tested test tree and lubricator. Tested well. Shut in and bled off. Set plug. Laid down lubricator and wireline. Pump KCl brine to kill well.

MATERIALS USED

NO INVENTORY USED ON THIS REPORT

SOLIDS EQUIPMENT

Device	Make	Si/Scrn	HR
Shkr #1	DFS - L/M	110	
Shkr #2	DFS - L/M	110	
dSlt #1	Harrisbug	12 * 4	
Cent #1	DFS	70 GPM	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
388	280
Active Volume	
668	
Reserve	Total
	668
Low Grav. vol %	0.0
ppb	0.00
High Grav. vol %	0.0
ppb	0.00
ASG	
Drill Cuttings	0
Dilution Rate	0.00
Slds Control Eff	75.00

MUD TYPE

KCL BRINE

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	0
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	0
LOSSES	bbl
Dumped	0
Lost	0
VOL GAIN/LOSS	0

RHEOLOGY AND HYDRAULICS

600 rpm	
300 rpm	
200 rpm	
100 rpm	
6 rpm	
3 rpm	
Pressure Units:	psig
Press Drop. DP	0
Press Drop. BIT	0
Press Drop. ANN	0
Actual Circ. Press	0
AV. DP m/min	0.0
AV. DC m/min	0.0
AV. Riser m/min	

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	12.0
ECD ppg	
Csg. Shoe	0.0
TD	0.0
Max. Diff. Press	0

DEVIATION INFO

MD	1558.0 m
TVD	1369.7 m
Angle	48.80
Direction	264.2
Horiz. Displ	503.3 m

TIME

DRLG	0.00
CIRC	0.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	24.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	03 9621 3311	DAILY COST	CUMULATIVE COST
Alan Searle	WAREHOUSE	Welshpool	TELEPHONE	03 5688 1445	DA 0.00	DA 109304.47

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908910 159

Baroid Australia Pty Ltd
DRILLING MUD REPORT
(Cost Modified)

REPORT NUMBER: 31

Date	Depth
31/03/99	1558.0m [MD]
Spud Date	Present Activity
06/03/99	RIG MOVE

OPERATOR	CONTRACTOR	RIG NUMBER
Western Underground Gas Stora	O.D.& E.	30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman / Jack Lambert	James Murray	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-4	PPL 2	Otway Basin	Austral

BIT DATA

Size	in.	
Type		
No. Jets		
Jets 32nd inch		

DRILLING STRING

	in.	OPEN HOLE		m
Pipe OD	ID	Len.		
Pipe OD	ID	Len.		
Pipe OD	ID	Len.		
Collar OD	ID	Len.		
Collar OD	ID	Len.		
Tot Noz Area	Size	Len.		
TFA	Size	Len.		
	Size	Len.		
	Size	Len.		
	Size	Len.		

CASING

	in.	m
20	Set @	5.0
13 3/8	Set @	504.0
9 5/8	Set @	1558.0
	Set @	
	Set @	
	Set @	
	Set @	
	Set @	

CIRCULATION DATA

Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/gt	0.068
gpm 0	bbl/min	0.0	
Pump Make/Model	Gardner Denver		
Size 6 X 8	Eff. 97.00	V/gt	0.068
gpm 0	bbl/min	0.0	
Pump Make/Model			
Size	Eff.	V/gt	
gpm	bbl/min		
Tot. Vol./min 0	gpm	0.0	bbl
BU Time 0	TC Time	0	

MUD PROPERTIES

Source	Primary: Pits, Uncl	2	3	Program Targets *=Excep	Essential Program Properties	
Time	23:04				629.1	1560.6
FL Temp Deg C	0					
Depth m	1558.0			P 2 3	<	9.2
Weight ppg	0.0					
FV @ 16 Deg C sec/qt	0				<	30
PV @ 49 Deg C cP	1					
YP lbs/100 ft2	0					
Gels lbs/100 ft2	0/0					
API Filt ml/30 min	0.0			*	6.0	8.0
HTHP @ 100 Deg C ml/30 min	0.0					
Cake API/HTHP 32nd in	0/0					
Corr Solids % by vol	0.0					
Oil/Water % by vol	0.0/0.0					
Sand % by vol						
MBT	0.0					
pH STRIP	0.0			*	8.5	9.2
Alk. Mud (Pm)	0.00					
Alk. Filtr (Pf/Mf)	0.00/0.00					
Chlorides mg/l	0					
Hard. Ca mg/l	0					
Low Gravity Solids ppb	0.00				<	74.00
LGS/Volume % by vol	0.0				<	8.0
6 rpm	0			*	10.00	15.00
KCl Content ppb						

MUD TREATMENTS

Pumped brine away to kill well after testing. Remaining brine dumped in preparation for rig move.

RIG ACTIVITY

Pumped brine into tubing, bled off gas and killed well. Rig down test tree, lid out landing joint. Nippled down BOP. Dumped and cleaned mud tanks. Installed wellhead bonnet, secured wellhead. Rig released @ 18:00 hours. Commenced rig move to next location.

MATERIALS USED

NO INVENTORY USED ON THIS REPORT

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFS - L/M	110	
Shkr #2	DFS - L/M	110	
dSlt #1	Harrisburg	12 * 4	
Cent #1	DFS	70 GPM	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
388	0
Active Volume	
388	
Reserve	Total
	388

Low Grav. Vol %	0.0
ppb	0.00
High Grav. Vol %	0.0
ppb	0.00
ADD	
Drill Cuttings	0
Dilution Rate	7.00
Mud Control Eff	75.00

MUD TYPE

KCL BRINE

MUD CONSUMPTION		
ADDITIONS	bbl	
Oil	0	
Brine Water	0	
Drill Water	0	
Sea Water	0	
Whole Mud	0	
Barite	0	
Chemicals	0	
LOSSES	bbl	
Dumped	75	
Lost	206	
VOL GAIN/LOSS	-281	

RHEOLOGY AND HYDRAULICS

600 rpm	
300 rpm	
200 rpm	
100 rpm	
6 rpm	
3 rpm	
Pressure Units:	psig
Press Drop. DP	0
Press Drop. BIT	0
Press Drop. ANN	0
Actual Circ. Press	0
AV. DP m/min	0.0
AV. DC m/min	0.0
AV. Riser m/min	

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	12.0
ECD ppg	
Csg. Shoe	0.0
TD	0.0
Max. Diff. Press	0

DEVIATION INFO

MD	1558.0	m
TVD	1369.7	m
Angle	48.80	
Direction	264.2	
Horiz. Displ	502.3	m

TIME

DRLG	0.00
CIRC	0.00
TRIPS	0.00
SERV. RIG	0.00
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	0.00
TESTING	0.00
OTHER	24.00
AVERAGE ROP	0.00

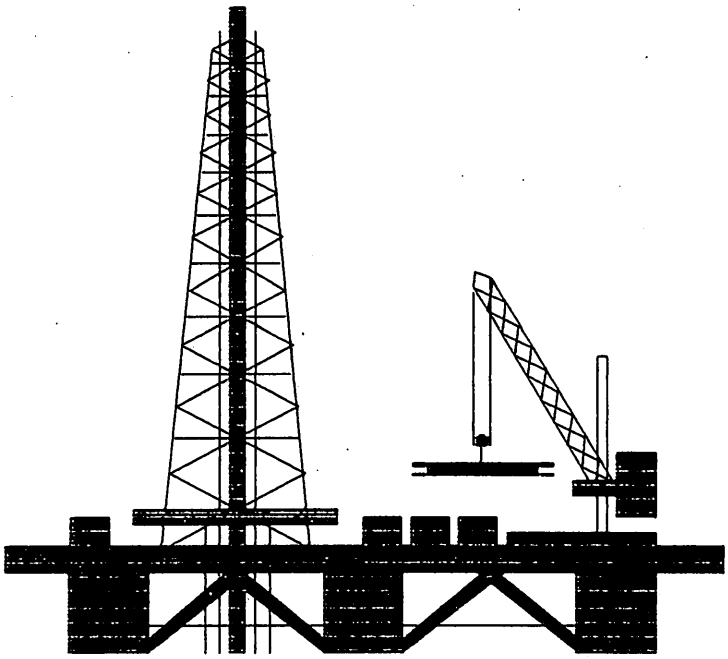
BAROID REPRESENTATIVE	OFFICE/HOME		TELEPHONE		DAILY COST	CUMULATIVE COST
Alan Searle	Melbourne		03 9621 3311		DA 0.00	DA 109304.47
	WAREHOUSE	Welshpool	TELEPHONE	03 5688 1445		

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

APPENDIX 10

Directional Drilling end of well report by Sperry Sun

WESTERN UNDERGROUND GAS STORAGE PTY. LTD.



DIRECTIONAL DRILLING END OF WELL REPORT

WELL : IONA #4

sperry-sun
DRILLING SERVICES

WESTERN UNDERGROUND GAS STORAGE PTY. LTD.

WELL : IONA #4

TABLE OF CONTENTS

Customer : **Western Underground Gas Storage Pty Ltd**

Well : **Iona 4**

Job Objectives:

BHA #1 - Objectives.
The objective of this 17½" assembly is to drill a vertical hole to casing point at +/- 630m.

BHA #2. Objective.
Drill out shoetrack and any cement stringers.

BHA #3. Objective.
The objective of BHA 3 is to drill to core point. A build section is planned at 3°/30m to an angle of 47.953 degrees. This angle will be held to core point and TD.

BHA #4. Objective.
Cut 10 meters of core in top of Belfast Mudstone.

BHA #5. Objective.
Drill to next core point holding angle.

BHA #6. Objective.
Core bottom of Belfast Mudstone/top Waarre Sand.

BHA #7. Objective.
Core Waarre Sand.

BHA #8. Objective.
Core Waarre Sand.

BHA #9. Objective.
Core Waarre Sand.

BHA #10. Objective.
Drill to TD.

Summary of Results:

BHA #1 - Results.
A vertical hole with a maximum of 0.6 degrees was drilled to a depth of 639m.
Most of the hole section was soft. The ROP was held back to ensure good hole cleaning.
A couple of hard stringers were encountered.
The 13 3/8" casing did not go to bottom. It became stuck at 504 meters. Probably differentially.

BHA #2. Results.
The shoetrack was drilled and a FIT performed.

BHA #3. Results.
There was concern about adequate hole cleaning, particularly cuttings settling out in the 17½" rathole. Wiper were carried out, initially each 150 meters, back to the end of the 17½" rathole to circulate the hole clean of any accumulated cuttings.
Sliding became slightly difficult after 800 meters TVD where the motor stabiliser would tend to hang up.
The motor bend was set at a 1.5 degrees, a smaller setting may have achieved the required 3°/30m build up rate above 800 meters, however it would have been difficult and time comsuming below 800 meters.
The two mud pumps were being run towards their maximum limits to optimize hole cleaning, the sand content was quite high and pump repairs were required from time to time.
Core point was reached at 1381 meters MD. The inclination and azimuth were lined up to well within the target boundaries. There was approximately 76 meters MD to target.

BHA #4. Results.
Resistance was felt right at kickoff point due OD (9½") and Stabilisers (3 x 12 3/16") on a 13m Core Barrel. As there was more coring planned it was decided to continue in the hole reaming rather than pulling out and running a reaming assembly. The assembly reamed from 656m to 1381m and cored from 1381 to 1383m then was pulled out of the hole for no progress. The core head was 3/16" undergauge.

BHA #5. Results.
This assembly drilled from 1383m to 1448.5m with no problems.

BHA #6. Results.
Cored from 1448.5m to 1455m and pulled for no progress, recoved 6.06m (93%).

BHA #7. Results.
Cored from 1455m to 1463.3m and pulled for no progress, recoved 8.3m (100%).

BHA #8. Results.
Cored from 1463.3m to 1471.5m and pulled for no progress, recoved 6.37m (78%).

BHA #9. Results.
Cored from 1471.5m to 1478.3m and pulled for no progress, recoved 7.71m (113%).

BHA #10. Results.
This assembly drilled from 1478m to 1560m with no problems, the hole was tight across the sands when pulling out of the hole. A single shot survey was dropped.

Discussion:

BHA Summary:

BHA #1 - Recomendations.
It is possible that the hole developed a bit of a kink whilst drilling through the hard stringers. This may have contributed to the problems with the casing. To safeguard against this possibility for subsequent wells, a stiffer BHA will be run.

BHA #2 - Recomendations.
The BHA performed as expected.

BHA #3 - Recomendations.
The BHA performed as expected. The build up rates were easily achievable with the 1.5 degree bend. Sliding was slow and difficult at times. A lower setting may have just made the required BUR, however it would have been very time consuming.

BHA #4 - Recomendations.
The BHA performed as expected, with continuous reaming from kick off point to core point. A reaming assembly was discussed and turned down due to cost/time considerations, it should not be discounted from future wells.

BHA #5 - Recomendations.
The BHA performance was unknow as no survey was taken.

BHA #6 - Recomendations.
The BHA performed as expected.

BHA #7 - Recomendations.
The BHA performed as expected.

BHA #8 - Recomendations.
The BHA performed as expected.

BHA #9 - Recomendations.
The BHA performed as expected.

BHA #10 - Recomendations.
The BHA performance was unknow as no survey was taken at the start of the run.

BHA #	Bit #	Motor Run #	Hole Size (in)	MD In (m)	MD Out (m)	TVD In (m)	TVD Out (m)	Inc In (deg)	Inc Out (deg)	Azi In (deg)	Azi Out (deg)	Drlg hrs	Circ hrs
1	1			5	639	5	639	0.0	0.5	134	270	43	2
2	2		12.250	639	639	639	639	0.5	0.5	270	270	0	9
3	2rr1	1	12.250	639	1381	639	1252	0.5	48.8	270	264	84	9
4	3		9.500	1381	1383	1252	1253	48.8	48.8	264	264	6	28
5	4		12.250	1383	1449	1253	1296	48.8	48.8	264	264	9	2
6	5		9.500	1449	1455	1296	1301	48.8	48.8	264	264	3	1
7	5rr1		9.500	1455	1463	1301	1306	48.8	48.8	264	264	2	2
8	5rr2		9.500	1463	1471	1306	1311	48.8	48.8	264	264	2	1
9	5rr3		9.500	1471	1478	1311	1316	48.8	48.8	264	264	1	1
10	4rr1		12.250	1478	1560	1316	1370	48.8	48.8	264	264	10	3

Table 1 - BHA Summary

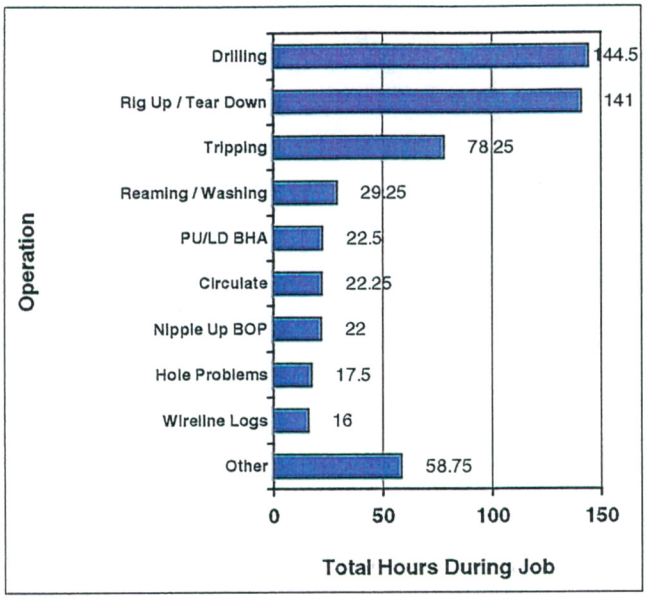
Motor Run #	Manufacturer	Type	Lobe	OD (in)	Gauge (in)	Bend (deg)	Adj	DLS (Ori) (°/30m)	ROP (Ori) (m/hr)	ROP (Rot) (m/hr)
1	SSDS	SperryDrill	6/7	8.000	12.062	1.50	N		6	10

Table 2 - Motor Run Summary

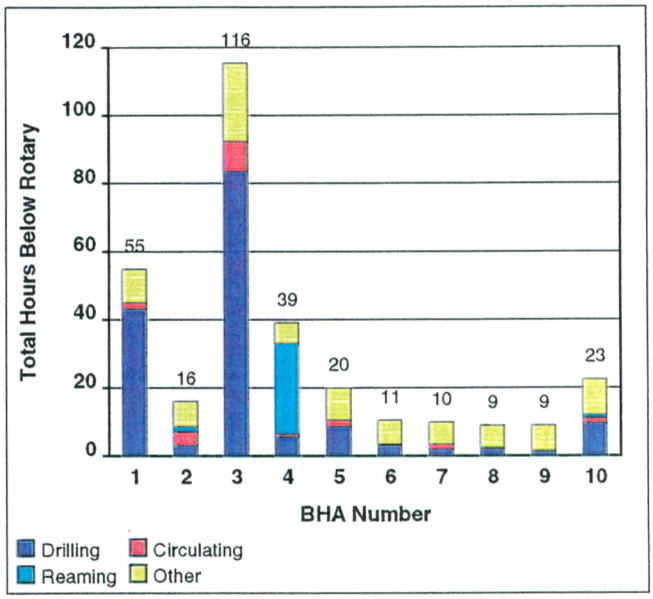
Bit #	Manufacturer	Style	OD (in)	Gge Len (in)	Nozzles (/32's)	TFA (in²)	Dull Grades I O D L B G O R	Ftge (m)	Drlg hrs	ROP (m/hr)
1	Hughes Christensen	GTX - G1			2x24, 1x18	1.132	1-2-WT-A -E-I-NO-TD	634	43.00	15
2	Security	ERA-03	12.250	1.000	3x24	1.325	1-1-WT-A -E-I-NO-BHA	0	0.00	
2rr1	Security	ERA-03	12.250	1.000	3x24	1.325	5-5-WT-A -E-3-SD-CP	742	83.50	9
3	Corpro	CM355F	9.500	2.000			1-1-RG-G -X-3-RO-PR	2	5.50	0
4	Security DBS	ERA-03D	12.250		3x18	0.746	1-1-NO-A -E-I-NO-CP	65	8.50	8
5	Corpro	CM459EE	9.500	2.000				6	3.00	2
5rr1	Corpro	CM459EE	9.500	2.000			1-1-NO-A -X-I-NO-PR	8	2.00	4
5rr2	Corpro	CM459EE	9.500	2.000				8	2.00	4
5rr3	Corpro	CM459EE	9.500	2.000			- - - - - - -	7	1.00	7
4rr1	Security DBS	ERA-03D	12.250		3x18	0.746		82	9.50	9

Table 3 - Bit Run Summary

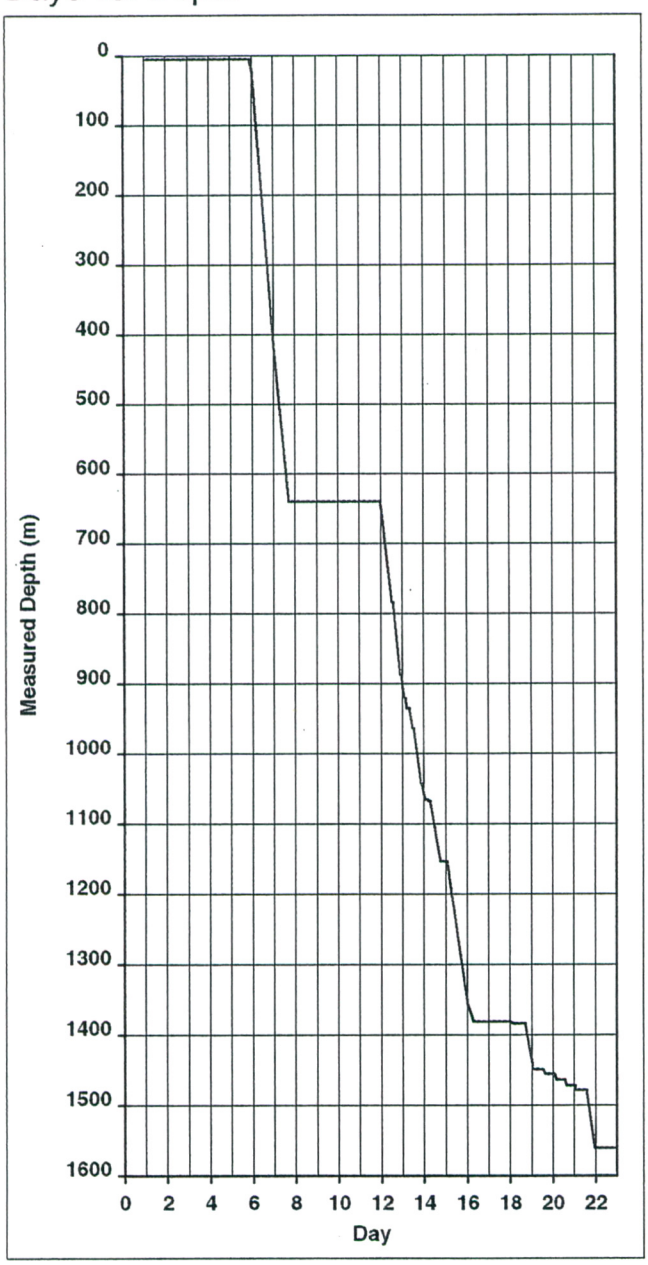
Hours by Operation Summary



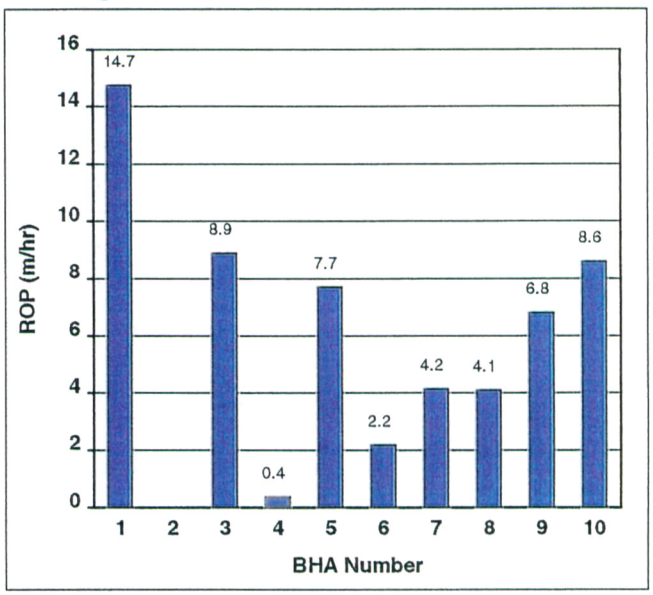
Hours per BHA Breakdown



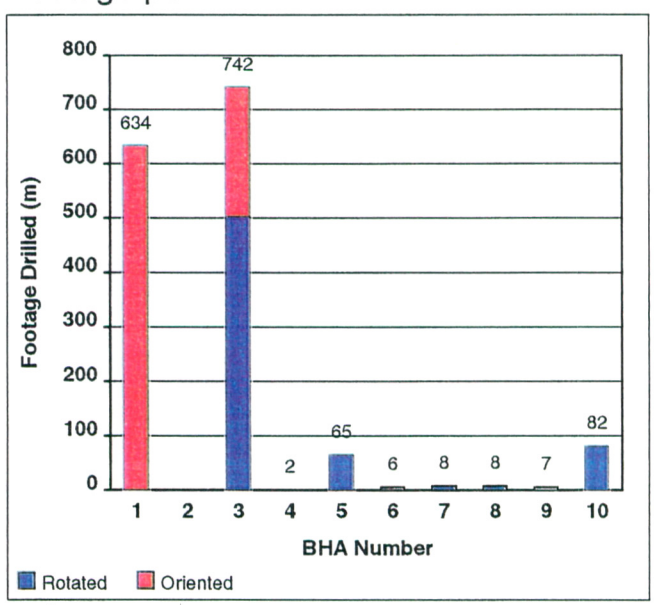
Days vs. Depth



Average Rate of Penetration per BHA



Footage per BHA



Sperry-Sun Drilling Services

Western Underground Gas Storage Pty Ltd
Iona 4
Rig 30

Australia
PPL 2 Otway Basin
AU-DD-90018

MD (m)	Bit Data	Drilling Parameters	Motor	BHA Stabilizers	Comments	BHA ID
	GTX - G1 2x24, 1x18 /32's 14.7 m/hr 43.00 hrs	WOB klbs RPM FLO gpm SPP psi		17.500 in @ 20.43 m	Drill a 17½" vertical hole to casing point at +/- 630m.	#1 @ 5
	ERA-03 3x24 /32's 8.9 m/hr 83.50 hrs	WOB 15 klbs RPM 74 FLO 735 gpm SPP 1373 psi	8° SperryDrill 6/7 L 1.50° BH	12.062 in @ 1.18 m 11.500 in @ 10.90 m	Build at 3°/30m. to a tangent angle of 47.953 degrees. This assembly will remain in the hole for the build and the tangent to core point (or bit trip).	#3 @ 639
	CM355F 0.4 m/hr 5.50 hrs	WOB 20 klbs RPM 60 FLO 350 gpm SPP 500 psi			This assembly reamed from 655m to 1381m.	#4 @ 1381
	ERA-03D 3x18 /32's 7.7 m/hr 8.50 hrs	WOB 20 klbs RPM 80 FLO 760 gpm SPP 2000 psi		12.250 in @ 1.36 m 11.500 in @ 12.35 m	Drill to next Core point while holding angle.	#5 @ 1383
	CM459EE 2.2 m/hr 3.00 hrs	WOB 10 klbs RPM 60 FLO 399 gpm SPP 500 psi				#6 @ 1449
	CM459EE 4.2 m/hr 2.00 hrs	WOB 10 klbs RPM 60 FLO 399 gpm SPP 500 psi				#7 @ 1455
	CM459EE 4.1 m/hr 2.00 hrs	WOB 10 klbs RPM 60 FLO 399 gpm SPP 500 psi				#8 @ 1463
	CM459EE 6.8 m/hr 1.00 hrs	WOB 11 klbs RPM 61 FLO 416 gpm SPP 568 psi				#9 @ 1471
	ERA-03D 3x18 /32's 8.6 m/hr 9.50 hrs	WOB 25 klbs RPM 80 FLO 776 gpm SPP 2050 psi		12.250 in @ 1.36 m 12.250 in @ 12.52 m	Drill to TD	#10 @ 1478

908910 167

Sperry-Sun Drilling Services

Survey Report for Iona #4

Western Underground Gas Storage Pty. Ltd. **Iona Drillpad**
Iona

Measured Depth (m)	Incl.	Azim.	Vertical Depth (m)	Northings (m)	Eastings (m)	Vertical Section (m)	Dogleg Rate (°/30m)
Iona #4 : Gyro Survey							
0.00	0.000	0.000	0.00	0.00 N	25.00 E	0.00	
40.00	0.080	133.550	40.00	0.02 S	25.02 E	-0.02	0.060
70.00	0.060	110.340	70.00	0.04 S	25.05 E	-0.05	0.034
100.00	0.070	141.160	100.00	0.06 S	25.08 E	-0.07	0.036
130.00	0.090	146.800	130.00	0.09 S	25.10 E	-0.09	0.021
160.00	0.070	136.860	160.00	0.13 S	25.13 E	-0.11	0.024
190.00	0.100	134.040	190.00	0.16 S	25.16 E	-0.14	0.030
220.00	0.140	130.120	220.00	0.20 S	25.20 E	-0.18	0.041
250.00	0.130	125.130	250.00	0.24 S	25.26 E	-0.23	0.015
280.00	0.110	124.290	280.00	0.28 S	25.31 E	-0.28	0.020
310.00	0.070	145.140	310.00	0.31 S	25.35 E	-0.31	0.051
340.00	0.090	134.480	340.00	0.34 S	25.37 E	-0.33	0.025
370.00	0.080	179.440	370.00	0.38 S	25.39 E	-0.34	0.066
400.00	0.090	169.650	400.00	0.42 S	25.39 E	-0.34	0.018
430.00	0.170	174.300	430.00	0.49 S	25.40 E	-0.34	0.081
461.30	0.220	162.600	461.30	0.59 S	25.43 E	-0.35	0.061
489.60	0.380	202.230	489.60	0.73 S	25.41 E	-0.31	0.268
518.00	0.210	179.250	518.00	0.87 S	25.37 E	-0.26	0.215
546.40	0.190	178.120	546.40	0.97 S	25.37 E	-0.25	0.022
575.00	0.160	180.840	575.00	1.06 S	25.38 E	-0.24	0.033
613.50	0.270	212.160	613.50	1.19 S	25.33 E	-0.18	0.122
632.00	0.230	267.890	632.00	1.23 S	25.27 E	-0.11	0.383
660.60	1.480	271.590	660.59	1.22 S	24.84 E	0.31	1.312
689.00	4.160	271.340	688.96	1.18 S	23.44 E	1.69	2.831
717.60	6.740	272.040	717.43	1.10 S	20.73 E	4.37	2.707
746.10	9.830	266.190	745.62	1.20 S	16.63 E	8.46	3.367
774.50	12.780	261.610	773.47	1.82 S	11.10 E	14.02	3.255
803.00	15.690	262.840	801.09	2.76 S	4.16 E	21.02	3.079
831.60	18.710	262.750	828.41	3.82 S	4.23 W	29.48	3.168
860.10	21.670	262.610	855.16	5.08 S	13.99 W	39.32	3.116
888.60	23.930	262.150	881.43	6.54 S	24.93 W	50.36	2.386
917.10	26.270	262.410	907.24	8.17 S	36.91 W	62.45	2.466
945.60	28.100	261.000	932.59	10.05 S	49.80 W	75.46	2.042
974.10	29.970	260.970	957.50	12.22 S	63.46 W	89.29	1.968
1002.60	32.710	262.200	981.84	14.38 S	78.12 W	104.10	2.962
1031.10	35.130	264.140	1005.49	16.26 S	93.91 W	120.00	2.790
1059.60	38.750	264.280	1028.27	17.99 S	110.95 W	137.12	3.812
1088.10	41.770	264.630	1050.01	19.77 S	129.28 W	155.53	3.188
1116.60	44.060	263.700	1070.88	21.74 S	148.58 W	174.94	2.501
1129.10	44.980	263.790	1079.80	22.70 S	157.29 W	183.70	2.213

Continued...

Sperry-Sun Drilling Services

Survey Report for Iona #4

Western Underground Gas Storage Pty. Ltd. **Iona Drillpad**
Iona

Measured Depth (m)	Incl.	Azim.	Vertical Depth (m)	Northings (m)	Eastings (m)	Vertical Section (m)	Dogleg Rate (°/30m)
Iona #4 : Definitive MWD Survey							
1152.66	46.300	262.700	1096.27	24.68 S	174.02 W	200.54	1.952
1181.16	47.300	262.500	1115.78	27.36 S	194.62 W	221.32	1.064
1209.66	47.600	263.100	1135.05	29.99 S	215.45 W	242.31	0.562
1238.19	46.900	264.100	1154.42	32.32 S	236.27 W	263.26	1.067
1266.66	46.800	263.300	1173.89	34.60 S	256.91 W	284.03	0.624
1295.18	46.300	262.900	1193.50	37.09 S	277.47 W	304.73	0.608
1323.70	45.700	263.600	1213.31	39.50 S	297.84 W	325.25	0.824
Iona #4 : Mag. Single Shot Survey							
1361.70	48.800	264.300	1239.11	42.44 S	325.59 W	353.15	2.481
1381.00	48.800	264.300	1251.82	43.88 S	340.04 W	367.66	0.000
1458.70	48.800	264.240	1303.00	49.72 S	398.21 W	426.11	0.017
1466.00	48.800	264.240	1307.81	50.27 S	403.67 W	431.60	0.000
1555.00	48.800	264.200	1366.43	57.01 S	470.30 W	498.55	0.010
1560.00	48.800	264.200	1369.72	57.39 S	474.04 W	502.32	0.000

All data is in metres unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to RTE. Northings and Eastings are relative to Drillpad Slot #4.

Coordinate System is UTM Zone 54S on Australian Datum 1984, Meters.
Grid Convergence at Surface is -1.270°. Magnetic Convergence at Surface is -12.206° (18-May-99)

The Dogleg Severity is in Degrees per 30m.
Vertical Section is from Iona #4 Wellhead and calculated along an Azimuth of 263.019° (Grid).

Based upon Minimum Curvature type calculations, at a Measured Depth of 1560.00m.,
The Bottom Hole Displacement is 502.33m., in the Direction of 263.439° (Grid).

Comments

Measured Depth (m)	Station Coordinates TVD (m)	Northings (m)	Eastings (m)	Comment
1560.00	1369.72	57.39 S	474.04 W	Extrapolation to TD

Continued...

Sperry-Sun Drilling Services

Survey Report for Iona #4

Western Underground Gas Storage Pty. Ltd. **Iona Drillpad**
Iona

Formation Tops

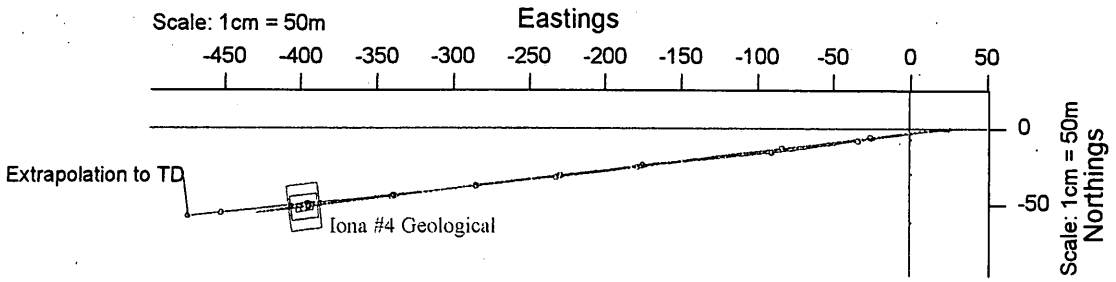
Measured Depth (m)	Vertical Depth (m)	Sub-Sea Depth (m)	Northings (m)	Eastings (m)	Formation Name
204.00	204.00	69.02	0.18 S	25.18 E	Narrawatuk Marl
285.00	285.00	150.02	0.28 S	25.32 E	Mepunga
339.00	339.00	204.02	0.34 S	25.37 E	Dilwyn
534.00	534.00	399.02	0.93 S	25.37 E	Pember Mudstone
603.00	603.00	468.02	1.15 S	25.35 E	Pebble Point
672.00	671.99	537.01	1.21 S	24.44 E	Paaratte
1029.00	1003.77	868.79	16.14 S	92.71 W	Skull Creek Member
1218.00	1140.69	1005.71	30.71 S	221.56 W	Nullawarre Greensand

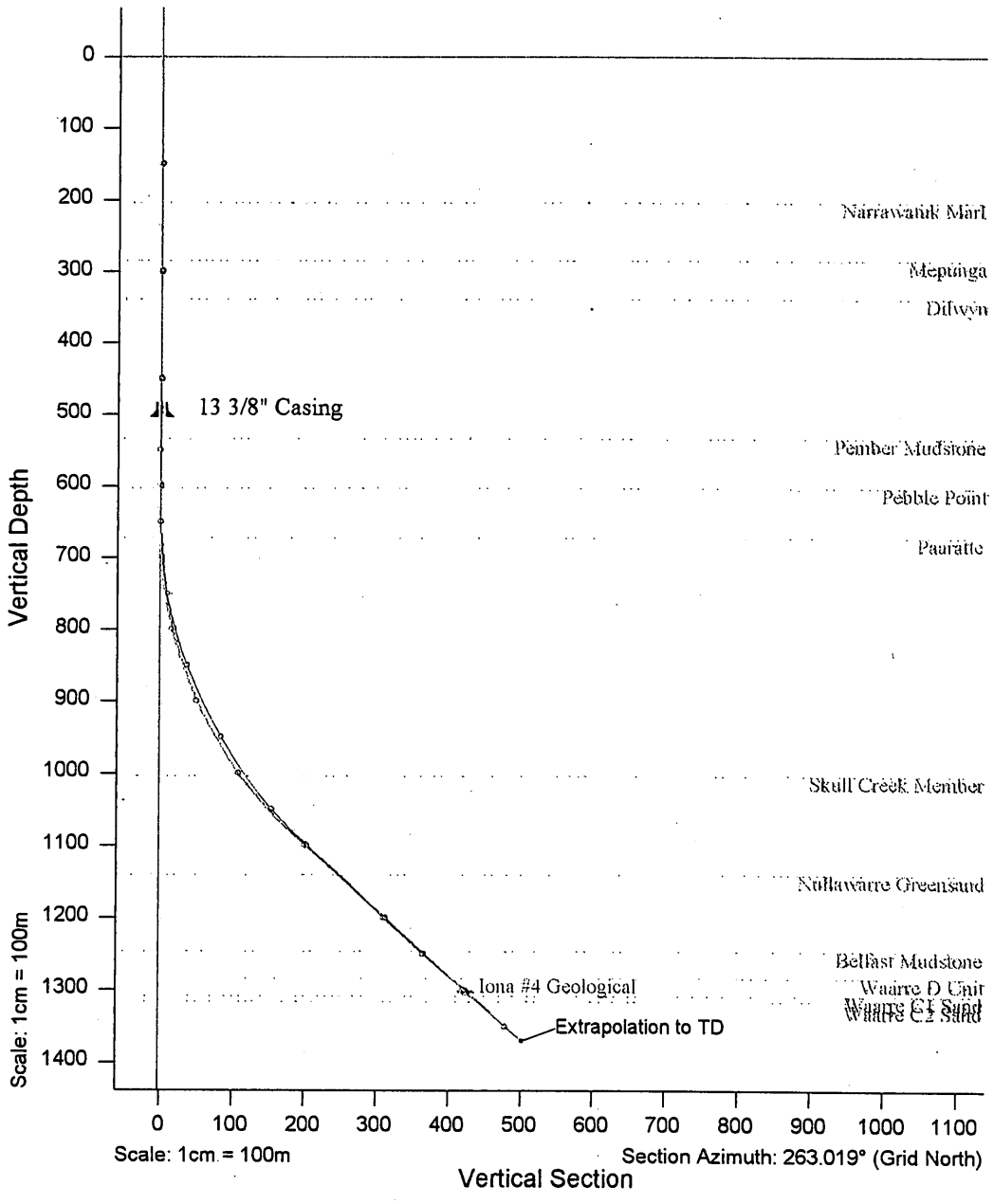
Casing details

From		To		
Measured Depth (m)	Vertical Depth (m)	Measured Depth (m)	Vertical Depth (m)	Casing Detail
5.00	5.00	504.15	504.15	13 3/8" Casing

sperry-sun DRILLING SERVICES A HALLIBURTON COMPANY | Western Underground Gas Storage Pty. Ltd. | DrillQuest

Well : Iona #4





sperry-sun
DRILLING SERVICES
Survey and Drilling Parameters

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Rig : Rig 30

Country : Australia
Lease : PPL 2 Otway Basin
Job # : AU-DD-90018

North Ref : Grid Declination : ° VS Dir : 263.01° (from 0.0N, 25.0E)

WELLBORE SURVEY										DRILLING PARAMETERS									
Measured Depth (m)	Incl Angle (deg)	Azi Dir (deg)	Vertical Depth (m)	Vertical Section (m)	Coordinates N/S (m)	Coordinates E/W (m)	DLS (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)	WOB (klbs)	RPM	Flow Rate (gpm)	Stand Pipe (psi)	Orientation From (m)	Orientation To (m)	Tool Face (deg)	ROP (m/hr)	BHA No. (#)	Comment
746.10	9.83	266.19	745.6	8.5	-1.2	16.6	3.37	3.25	-6.16	10		750	1150	717	718	HS		3	
														718	720	HS	20	3	
														726	732	20L		3	
														736	741	25L		3	
774.50	12.78	261.61	773.5	14.0	-1.8	11.1	3.25	3.12	-4.84	10		750	1200	745	746	30L		3	
														746	751	30L	20	3	
														754	761	40L		3	
														764	768	20L		3	
803.00	15.69	262.84	801.1	21.0	-2.8	4.2	3.08	3.06	1.29	10		750	1280	774	774	HS		3	
														774	777	HS	20	3	
														783	788	15L		3	
														793	797	HS		3	
831.60	18.71	262.75	828.4	29.5	-3.8	-4.2	3.17	3.17	-0.09	10		750	1280	802	803	HS		3	
														803	806	HS	20	3	
														812	816	10L		3	
														821	826	15L		3	
860.10	21.67	262.61	855.2	39.3	-5.1	-14.0	3.12	3.12	-0.15	15		750	1260	831	832	10L		3	
														832	835	10L	10	3	
														840	844	HS		3	
														850	854	15L		3	
888.60	23.93	262.15	881.4	50.4	-6.5	-24.9	2.39	2.38	-0.48	15		750	1260	859	860	20L		3	
														860	863	20L	10	3	
														869	872	20L		3	
														878	881	HS		3	
917.10	26.27	262.41	907.2	62.4	-8.2	-36.9	2.47	2.46	0.27	15		750	1330	888	889	10R		3	
														889	891	10R	10	3	
														897	901	HS		3	
														907	910	20L		3	
														916	917	20L		3	

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DRILLING SERVICES
Survey and Drilling Parameters

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Rig : Rig 30

Country : Australia
Lease : PPL 2 Otway Basin
Job # : AU-DD-90018

North Ref : Grid **Declination** : ° **VS Dir** : 263.01° (from 0.0N, 25.0E)

WELLBORE SURVEY										DRILLING PARAMETERS									
Measured Depth (m)	Incl Angle (deg)	Azi Dir (deg)	Vertical Depth (m)	Vertical Section (m)	Coordinates N/S (m)	Coordinates E/W (m)	DLS (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)	WOB (klbs)	RPM	Flow Rate (gpm)	Stand Pipe (psi)	Orientation From (m)	Orientation To (m)	Tool Face (deg)	ROP (m/hr)	BHA No. (#)	Comment
945.60	28.10	261.00	932.6	75.5	-10.1	-49.8	2.04	1.93	-1.48	15		750	1330	917	920	20L	10	3	
														926	928	20L		3	
														935	938	20L		3	
														945	946	20L		3	
974.10	29.97	260.97	957.5	89.3	-12.2	-63.5	1.97	1.97	-0.03	15		750	1480	946	947	20L	10	3	
														954	958	20L		3	
														964	968	20L		3	
														973	974	HS		3	
1002.60	32.71	262.20	981.8	104.1	-14.4	-78.1	2.96	2.88	1.29	15		750	1480	974	977	HS	10	3	
														983	987	10R		3	
														992	996	10R		3	
														1002	1003	10R		3	
1031.10	35.13	264.14	1005.5	120.0	-16.3	-93.9	2.79	2.55	2.04	20		750	1480	1003	1006	10R	10	3	
														1011	1016	30R		3	
														1021	1025	10R		3	
														1030	1031	10R		3	
1059.60	38.75	264.28	1028.3	137.1	-18.0	-110.9	3.81	3.81	0.15	30		750	1480	1031	1032	10R	5	3	
														1033	1036	HS		3	
														1040	1044	10L		3	
														1049	1054	10L		3	
														1059	1060	HS		3	
1088.10	41.77	264.63	1050.0	155.5	-19.8	-129.3	3.19	3.18	0.37	30		730	1400	1060	1063	HS	5	3	
														1068	1072	HS		3	
														1078	1082	HS		3	
														1087	1088	HS		3	
1116.60	44.06	263.70	1070.9	174.9	-21.7	-148.6	2.50	2.41	-0.98	30		760	1450	1088	1090	HS	5	3	
														1097	1100	HS		3	
														1106	1110	30L		3	
														1116	1117	HS		3	

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DRILLING SERVICES
Survey and Drilling Parameters

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Rig : Rig 30

Country : Australia
Lease : PPL 2 Otway Basin
Job # : AU-DD-90018

North Ref : Grid **Declination** : ° **VS Dir** : 263.01° (from 0.0N, 25.0E)

WELLBORE SURVEY										DRILLING PARAMETERS									
Measured Depth (m)	Incl Angle (deg)	Azi Dir (deg)	Vertical Depth (m)	Vertical Section (m)	Coordinates N/S (m)	Coordinates E/W (m)	DLS (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)	WOB (klbs)	RPM	Flow Rate (gpm)	Stand Pipe (psi)	Orientation From (m)	Orientation To (m)	Tool Face (deg)	ROP (m/hr)	BHA No. (#)	Comment
1129.10	44.98	263.79	1079.8	183.7	-22.7	-157.3	2.21	2.21	0.22	30		760	1600	1117	1119	HS	5	3	
														1125	1129	10L		3	
1152.66	46.30	262.70	1096.3	200.5	-24.7	-174.0	1.95	1.68	-1.39	20	80	760	1600	1129	1130	10L	15	3	
														1135	1140	15L		3	
1181.16	47.30	262.50	1115.8	221.3	-27.4	-194.6	1.06	1.05	-0.21	20	80	760	1600	1173	1176	10R	15	3	
1209.66	47.60	263.10	1135.1	242.3	-30.0	-215.4	0.56	0.32	0.63	20	80	760	1600	1182	1185	10R	10	3	
1238.19	46.90	264.10	1154.4	263.3	-32.3	-236.3	1.07	-0.74	1.05	20	80	760	1600				10	3	
1266.66	46.80	263.30	1173.9	284.0	-34.6	-256.9	0.62	-0.11	-0.84	15	80	760	1600	1258	1261	40L	10	3	
1295.18	46.30	262.90	1193.5	304.7	-37.1	-277.5	0.61	-0.53	-0.42	15	80	760	1600				10	3	
1323.70	45.70	263.60	1213.3	325.2	-39.5	-297.8	0.82	-0.63	0.74	15	80	760	1600	1315	1319	HS	10	3	
1361.70	48.80	264.30	1239.1	353.1	-42.4	-325.6	2.48	2.45	0.55	15	80	760	1600	1344	1348	15L	10	3	Core point.
														1353	1358	10L		3	
1381.00	48.80	264.30	1251.8	367.7	-43.9	-340.0	0.00	0.00	0.00	20	60	350	500	1363	1365	30L	1	4	
1458.70	48.80	264.24	1303.0	426.1	-49.7	-398.2	0.02	0.00	-0.02	10	60	399	500					7	Target
1466.00	48.80	264.24	1307.8	431.6	-50.3	-403.7	0.00	0.00	0.00	10	60	399	500					8	Top C1
1555.00	48.80	264.20	1366.4	498.6	-57.0	-470.3	0.01	0.00	-0.01	25	80	776	2050				10	10	
1560.00	48.80	264.20	1369.7	502.3	-57.4	-474.0	0.00	0.00	0.00									10	TD

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DRILLING SERVICES

BHA Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 1

BHA# 1 : Date In 06/03/19 MD In (m) : 5 TVD In (m) : 5 Date Out 09/03/199 MD Out (m): 639 TVD Out (m): 639

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
1		Hughes Christensen	GTX - G1	C83DR	2x24, 1x18	1.132	1-2-WT-A -E-I-NO-TD

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Tricone	C83DR			17.500	500.00	P 7-5/8" Reg	0.40	
2	Bit Sub c/w float		9.000	5.310		141.34	B 6-5/8" Reg	0.82	
3	Drill collar c/w totco		7.870	2.810		144.65	B 6-5/8" Reg	9.38	
4	Non-Mag Drill collar	6849	8.000	2.810		150.17	B 6-5/8" Reg	8.93	
5	Integral Blade Stabiliser	47615	8.250	3.000	17.500	158.09	B 6-5/8" Reg	2.15	20.43
6	4x Drill collar		8.000	3.000		147.22	B 6-5/8" Reg	35.84	
7	X/O Sub 6 5/8"P x 4"IF B		8.000	3.000		147.22	B 4" IF	0.72	
8	Drilling Jar		6.250	2.250		91.01	B 6-5/8" Reg	10.34	
9	X/O Sub 4" IF P x 4½" IF B		6.500	2.875		90.96	B 4-1/2" IF	0.87	
10	HWDP		5.000	3.000		49.30	B 4-1/2" IF	273.01	
11	X/O Sub 4½" IF P x 4 IF B		5.000	3.000		42.83	B 4" IF	0.52	
								342.98	

Parameter	Min	Max	Ave
WOB (klbs) :			
RPM (rpm) :			
Flow (gpm) :			
SPP (psi) :			

Activity	Hrs
Drilling :	43.00
Reaming :	0.00
Circ-Other :	2.00
Total :	45.00

BHA Weight	(lb)
in Air (Total) :	76239
in Mud (Total) :	65781
in Air (Bel Jars :	28661
in Mud (Bel Jars :	24729

Drill String	OD(in)	Len(m)
DP(G)-NC46(XH)-16.60#	4.500	296

PERFORMANCE

	In	Out
Inclination (deg)	0.01	0.54
Azimuth (deg)	133.55	270.39

	Distance(m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :	634.00	0			
Rotated :	0.00	0			
Total :	634.00	15	0.02	0.00	0.03

COMMENTS

Drill a 17½" vertical hole to casing point at +/- 630m.

sperry-sun DRILLING SERVICES

BHA Report page 2

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 1

OBJECTIVES:

BHA 1 - Objectives.
The objective of this 17½" assembly is to drill a vertical hole to casing point at +/- 630m.

RESULTS:

BHA 1 - Results.
A vertical hole with a maximum of 0.6 degrees was drilled to a depth of 639m. Most of the hole section was a soft formation. The ROP was held back to ensure good hole cleaning. A couple of hard stringers were encountered.
The 13 3/8" casing did not go to bottom. It became stuck at 504 meters. Probably differentially.

RECOMMENDATIONS:

BHA 1 - Recomendations.
It is possible that the hole developed a bit of a kink whilst drilling through the hard stringers. This may have contributed to the problems with the casing. To safeguard against this possibility for subsequent wells, a stiffer BHA will be run.

sperry-sun DRILLING SERVICES

BHA Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 2

BHA# 2 : Date In 11/03/19 MD In (m) : 639 TVD In (m) : 639 Date Out 12/03/199 MD Out (m): 639 TVD Out (m): 639

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
2	12.250	Security	ERA-03	679091	3x24	1.325	1-1-WT-A -E-I-NO-BHA

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Security, ERA-03	679091	12.250		12.250	150.00	P 6-5/8" Reg	0.36	
2	Bit Sub		8.000			150.00	B 6-5/8" Reg	0.98	
3	Drill collar - 6 5/8 R		8.000	3.000		147.00	B 5-1/2" Reg	9.38	
4	Non-Mag - 6 5/8 R	6849	8.000	3.000		147.00	B 6-5/8" Reg	8.93	
5	4x Drill collar - 6 5/8 R		8.000	3.000		147.00	B 6-5/8" Reg	35.84	
6	Cross Over Sub		6.500	2.810		91.95	B 4" IF	0.72	
7	Cross Over Sub		6.125	2.625		81.97	B 4-1/2" IF	0.49	
8	Drilling Jar 4½" IF	1416-1128	6.375	2.750		88.54	B 4-1/2" IF	9.83	
9	30x HWDP - 4½" IF		5.000	3.000		49.30	B 4-1/2" IF	273.01	
10	Cross Over Sub		5.000	3.000		42.83	B 4" IF	0.52	
								340.06	

Parameter	Min	Max	Ave
WOB (klbs) :			
RPM (rpm) :			
Flow (gpm) :			
SPP (psi) :			

Activity	Hrs
Drilling :	0.00
Reaming :	1.50
Circ-Other :	7.00
Total :	8.50

BHA Weight	(lb)
in Air (Total) :	74211
in Mud (Total) :	64031
in Air (Bel Jars :	27124
in Mud (Bel Jars :	23403

Drill String	OD(in)	Len (m)
DP(G)-NC46(XH)-16.60#	4.500	299

PERFORMANCE

	In	Out
Inclination (deg)	0.54	0.54
Azimuth (deg)	270.39	270.39

	Distance (m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :					
Rotated :					
Total :					

COMMENTS

Drill out shoe and rathole. (13 3/8" casing was set at 504 metres, leaving a 135 metre rathole.)

sperry-sun DRILLING SERVICES

BHA Report page 2

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 2

OBJECTIVES:

BHA 2. Objective.
Drill out shoetrack and any cement stringers.

RESULTS:

BHA 2. Results.
The shoetrack was drilled and a FIT performed.

RECOMMENDATIONS:

BHA 2 Recomendations.
The BHA performed as expected.

908910 179

sperry-sun
DRILLING SERVICES

BHA Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 3

BHA# 3 : Date In 12/03/19 MD In (m) : 639 TVD In (m) : 639 Date Out 17/03/199 MD Out (m): 1381 TVD Out (m): 1252

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
2rr1	12.250	Security	ERA-03	679091	3x24	1.325	5-5-WT-A -E-3-SD-CP

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs
1	8.000	SSDS	SperryDrill	800177	1.50°		62	92.50

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Security, ERA-03	679091	12.250		12.250	150.00	P 6-5/8" Reg	0.36	
2	8" SperryDrill Lobe 6/7 - 4.0 stg	800177	8.000	5.250	12.062	97.53	B 6-5/8" Reg	9.61	1.18
3	Sleeve Type Stabiliser	2426/7484	8.063	3.000	11.500	149.92	B 6-5/8" Reg	1.86	10.90
4	Float Sub	A 234	8.125	3.312		147.34	B 6-5/8" Reg	0.73	
5	8" DWD 1200 System	HOC46807	8.375	3.750		150.10	B 6-5/8" Reg	9.91	
6	Non-Mag Drill collar	6849	8.000	2.810		150.17	B 6-5/8" Reg	8.93	
7	Cross Over Sub		6.500	2.810		91.95	B 4" IF	0.72	
8	Cross Over Sub		6.125	2.625		81.97	B 4-1/2" IF	0.49	
9	24x HWDP - 4½" IF		5.000	3.000		49.30	B 4-1/2" IF	218.64	
10	Drilling Jar 4½" IF	1416-1128	6.375	2.750		88.54	B 4-1/2" IF	9.83	
11	6x HWDP - 4½" IF		4.500	2.750		41.00	B 4-1/2" IF	54.37	
12	Cross Over Sub		5.000	3.000		42.83	B 4" IF	0.52	
								315.97	

Parameter		Min	Max	Ave
WOB (klbs)	:	5	45	15
RPM (rpm)	:	55	80	74
Flow (gpm)	:	560	760	735
SPP (psi)	:	720	1600	1373

Activity	Hrs
Drilling :	83.50
Reaming :	0.00
Circ-Other :	9.00
Total :	92.50

BHA Weight	(lb)
in Air (Total) :	59755
in Mud (Total) :	51649
in Air (Bel Jars :	49513
in Mud (Bel Jars :	42796

Drill String	OD(in)	Len (m)
DP(G)-NC46(XH)-16.60#	4.500	1065

PERFORMANCE

	In	Out
Inclination (deg)	0.54	48.80
Azimuth (deg)	270.39	264.30

	Distance (m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :	238.89	6			
Rotated :	503.11	10			
Total :	742.00	9	1.95	0.00	1.95

COMMENTS

Build at 3°/30m. to a tangent angle of 47.953 degrees.
This assembly will remain in the hole for the build and the tangent to core point (or bit trip).

sperry-sun DRILLING SERVICES

BHA Report page 2

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 3

OBJECTIVES:

BHA 3. Objectives.
The objective of BHA #3 is to drill to core point. A build section is planned at 3°/30m to an angle of 47.953 degrees. This angle will be held to core point and TD.

RESULTS:

There was concern about adequate hole cleaning, particularly cuttings settling out in the 17½" rathole. Wiper were carried out, initially each 150 meters, back to the end of the 17½" rathole to circulate the hole clean of any accumulated cuttings.
Sliding became slightly difficult after 800 meters TVD where the motor stabiliser would tend to hang up.
The motor bend was set at a 1.5 degrees, a smaller setting may have achieved the required 3°/30m build up rate above 800 meters, however it would have been difficult and time comsuming below 800 meters.
The two mud pumps were being run towards their maximum limits to optimize hole cleaning, the sand content was quite high and pump repairs were required from time to time.
Core point was reached at 1381 meters MD. The inclination and azimuth were lined up to well within the target boundaries. There was approximately 76 meters MD to target.

The bit was 3/16" undergauge with even wear on all teeth, extensive wear on the upper part of the shirttails to a maximum of 1/2". The Motor sleeve was worn down to 12" with a slight taper towards the bit, two blades had excessive wear on leading edge of blade, and were starting to O-Ring.

RECOMMENDATIONS:

Overall the assembly performed well, but was not as neutral in rotary as was expected, dropping between 0.1 and 0.6°/30m. A smaller gauge stabiliser than the 11½" run on top of the motor is required if the assembly is to hold in rotary. Also in view of the undergauge bit, the motor stabiliser had been doing some hole opening. Reducing the motor stabiliser size from 12 1/16" to 12" would aid sliding as the bit wore but would also need smaller top stabiliser. Future wells should try a 12" Motor stabiliser with an 11" top stabiliser.

sperry-sun DRILLING SERVICES

BHA Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 4

BHA# 4 : Date In 17/03/19 MD In (m) : 1381 TVD In (m) : 1252 Date Out 19/03/199 MD Out (m): 1383 TVD Out (m): 1253

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
3	9.500	Corpro	CM355F	774301			1-1-RG-G -X-3-RO-PR

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Core Head	774301	9.500	5.250	12.250	167.79		0.39	
2	CoreBarrel		9.500	7.000	12.210	110.41	B 6-5/8" Reg	13.56	
3	Non-Mag Drill collar	6849	8.000	2.810		150.17	B 6-5/8" Reg	8.93	
4	2x Drill collar		8.000	3.000		147.00	B 6-5/8" Reg	18.40	
5	Cross Over Sub		6.500	2.810		91.95	B 4" IF	0.72	
6	Cross Over Sub		6.125	2.625		81.97	B 4-1/2" IF	0.49	
7	24x HWDP - 4½" IF		5.000	3.000		49.30	B 4-1/2" IF	218.64	
8	Drilling Jar 4½" IF	1416-1128	6.375	2.750		88.54	B 4-1/2" IF	9.83	
9	6x HWDP - 4½" IF		4.500	2.750		41.00	B 4-1/2" IF	54.37	
10	Cross Over Sub		5.000	3.000		42.83	B 4" IF	0.52	
								325.85	

Parameter		Min	Max	Ave
WOB (klbs)	:	20	20	20
RPM (rpm)	:	60	60	60
Flow (gpm)	:	350	350	350
SPP (psi)	:	500	500	500

Activity	Hrs
Drilling :	5.50
Reaming :	26.75
Circ-Other :	0.75
Total :	33.00

BHA Weight	(lb)
in Air (Total) :	64355
in Mud (Total) :	55429
in Air (Bel Jars :	54113
in Mud (Bel Jars :	46608

Drill String	OD(in)	Len (m)
DP(G)-NC46(XH)-16.60#	4.500	1057

PERFORMANCE

	In	Out
Inclination (deg)	48.80	48.80
Azimuth (deg)	264.30	264.30

	Distance (m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :	0.00	0			
Rotated :	2.00	0			
Total :	2.00	0	0.00	-0.02	0.00

COMMENTS

This assembly reamed from 655m to 1381m.

908910 182

sperry-sun
DRILLING SERVICES

BHA Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 5

BHA# 5 : Date In 19/03/19 MD In (m) : 1383 TVD In (m) : 1253 Date Out 20/03/199 MD Out (m): 1449 TVD Out (m): 1296

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
4	12.250	Security DBS	ERA-03D	681061	3x18	0.746	1-1-NO-A -E-I-NO-CP

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Security ERA-03D	681061	12.250		12.250		P 6-5/8" Reg	0.36	
2	Integral Blade Stabiliser- Near Bit	47602	8.250	2.810	12.250	161.04	B 6-5/8" Reg	2.13	1.36
3	Non-Mag Drill collar	6849	8.000	2.810		150.17	B 6-5/8" Reg	8.93	
4	Sleeve Type Stabiliser	2426/7484	8.063	3.000	11.500	149.92	B 6-5/8" Reg	1.86	12.35
5	2x Drill collar		8.000	3.000		147.00	B 6-5/8" Reg	18.40	
6	Cross Over Sub		6.500	2.810		91.95	B 4" IF	0.72	
7	Cross Over Sub		6.125	2.625		81.97	B 4-1/2" IF	0.49	
8	24x HWDP - 4½" IF		5.000	3.000		49.30	B 4-1/2" IF	218.64	
9	Drilling Jar 4½" IF	1416-1128	6.375	2.750		88.54	B 4-1/2" IF	9.83	
10	6x HWDP - 4½" IF		4.500	2.750		41.00	B 4-1/2" IF	54.37	
11	Cross Over Sub		5.000	3.000		42.83	B 4" IF	0.52	
								316.25	

Parameter		Min	Max	Ave
WOB (klbs)	:	20	20	20
RPM (rpm)	:	80	80	80
Flow (gpm)	:	760	760	760
SPP (psi)	:	2000	2000	2000

Activity	Hrs
Drilling :	8.50
Reaming :	0.00
Circ-Other :	2.00
Total :	10.50

BHA Weight	(lb)
in Air (Total) :	
in Mud (Total) :	
in Air (Bel Jars :	0
in Mud (Bel Jars :	0

Drill String	OD(in)	Len(m)
DP(G)-NC46(XH)-16.60#	4.500	1132

PERFORMANCE

	In	Out
Inclination (deg)	48.80	48.80
Azimuth (deg)	264.30	264.25

	Distance(m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :	0.00	0			
Rotated :	65.50	0			
Total :	65.50	8	0.00	-0.02	0.02

COMMENTS

Drill to next Core point while holding angle.

908910 183

sperry-sun
DRILLING SERVICES

BHA Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 6

BHA# 6 : Date In 20/03/19 MD In (m) : 1449 TVD In (m) : 1296 Date Out 20/03/199 MD Out (m): 1455 TVD Out (m): 1301

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
5	9.500	Corpro	CM459EE	08763			

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Core Head	08763	9.500	5.250	12.250	167.79		0.39	
2	Core Barrel		9.500	7.000	12.210	110.41	B 6-5/8" Reg	13.56	
3	Non-Mag Drill collar	6849	8.000	2.810		150.17	B 6-5/8" Reg	8.93	
4	2x Drill collar		8.000	3.000		147.00	B 6-5/8" Reg	18.40	
5	Cross Over Sub		6.500	2.810		91.95	B 4" IF	0.72	
6	Cross Over Sub		6.125	2.625		81.97	B 4-1/2" IF	0.49	
7	24x HWDP - 4½" IF		5.000	3.000		49.30	B 4-1/2" IF	218.64	
8	Drilling Jar 4½" IF	1416-1128	6.375	2.750		88.54	B 4-1/2" IF	9.83	
9	6x HWDP - 4½" IF		4.500	2.750		41.00	B 4-1/2" IF	54.37	
10	Cross Over Sub		5.000	3.000		42.83	B 4" IF	0.52	
								325.85	

Parameter		Min	Max	Ave
WOB (klbs)	:	10	10	10
RPM (rpm)	:	60	60	60
Flow (gpm)	:	399	399	399
SPP (psi)	:	500	500	500

Activity	Hrs
Drilling :	3.00
Reaming :	0.00
Circ-Other :	0.50
Total :	3.50

BHA Weight	(lb)
in Air (Total)	64355
in Mud (Total)	55429
in Air (Bel Jars	54113
in Mud (Bel Jars	46608

Drill String	OD(in)	Len(m)
DP(G)-NC46(XH)-16.60#	4.500	1129

PERFORMANCE

	In	Out
Inclination (deg)	48.80	48.80
Azimuth (deg)	264.25	264.24

	Distance(m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :	0.00	0			
Rotated :	6.50	0			
Total :	6.50	2	0.00	-0.02	0.00

COMMENTS

sperry-sun DRILLING SERVICES

BHA Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 7

BHA# 7 : Date In 20/03/19 MD In (m) : 1455 TVD In (m) : 1301 Date Out 21/03/199 MD Out (m): 1463 TVD Out (m): 1306

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
5rr1	9.500	Corpro	CM459EE	08763			1-1-NO-A -X-I-NO-PR

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Core Head	08763	9.500	5.250	12.250	167.79		0.39	
2	Core Barrel		9.500	7.000	12.210	110.41	B 6-5/8" Reg	13.56	
3	Non-Mag Drill collar	6849	8.000	2.810		150.17	B 6-5/8" Reg	8.93	
4	2x Drill collar		8.000	3.000		147.00	B 6-5/8" Reg	18.40	
5	Cross Over Sub		6.500	2.810		91.95	B 4" IF	0.72	
6	Cross Over Sub		6.125	2.625		81.97	B 4-1/2" IF	0.49	
7	24x HWDP - 4½" IF		5.000	3.000		49.30	B 4-1/2" IF	218.64	
8	Drilling Jar 4½" IF	1416-1128	6.375	2.750		88.54	B 4-1/2" IF	9.83	
9	6x HWDP - 4½" IF		4.500	2.750		41.00	B 4-1/2" IF	54.37	
10	Cross Over Sub		5.000	3.000		42.83	B 4" IF	0.52	
								325.85	

Parameter		Min	Max	Ave
WOB (klbs)	:	10	10	10
RPM (rpm)	:	60	60	60
Flow (gpm)	:	399	399	399
SPP (psi)	:	500	500	500

Activity	Hrs
Drilling :	2.00
Reaming :	0.00
Circ-Other :	1.50
Total :	3.50

BHA Weight	(lb)
in Air (Total) :	64355
in Mud (Total) :	55331
in Air (Bel Jars :	54113
in Mud (Bel Jars :	46525

Drill String	OD(in)	Len (m)
DP(G)-NC46(XH)-16.60#	4.500	1137

PERFORMANCE

	In	Out
Inclination (deg)	48.80	48.80
Azimuth (deg)	264.24	264.24

	Distance (m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :	0.00	0			
Rotated :	8.30	0			
Total :	8.30	4	0.00	-0.01	0.00

COMMENTS

908910 185

sperry-sun DRILLING SERVICES

BHA Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 8

BHA# 8 : Date In 21/03/19 MD In (m) : 1463 TVD In (m) : 1306 Date Out 21/03/199 MD Out (m): 1471 TVD Out (m): 1311

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
5rr2	9.500	Corpro	CM459EE	08763			

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Core Head	08763	9.500	5.250	12.250	167.79		0.39	
2	CoreBarrel		9.500	7.000	12.210	110.41	B 6-5/8" Reg	13.56	
3	Non-Mag Drill collar	6849	8.000	2.810		150.17	B 6-5/8" Reg	8.93	
4	2x Drill collar		8.000	3.000		147.00	B 6-5/8" Reg	18.40	
5	Cross Over Sub		6.500	2.810		91.95	B 4" IF	0.72	
6	Cross Over Sub		6.125	2.625		81.97	B 4-1/2" IF	0.49	
7	24x HWDP - 4½" IF		5.000	3.000		49.30	B 4-1/2" IF	218.64	
8	Drilling Jar 4½" IF	1416-1128	6.375	2.750		88.54	B 4-1/2" IF	9.83	
9	6x HWDP - 4½" IF		4.500	2.750		41.00	B 4-1/2" IF	54.37	
10	Cross Over Sub		5.000	3.000		42.83	B 4" IF	0.52	
								325.85	

Parameter	Min	Max	Ave
WOB (klbs) :	10	10	10
RPM (rpm) :	60	60	60
Flow (gpm) :	399	399	399
SPP (psi) :	500	500	500

Activity	Hrs
Drilling :	2.00
Reaming :	0.00
Circ-Other :	0.50
Total :	2.50

BHA Weight	(lb)
in Air (Total) :	64355
in Mud (Total) :	55331
in Air (Bel Jars :	54113
in Mud (Bel Jars :	46525

Drill String	OD(in)	Len (m)
DP(G)-NC46(XH)-16.60#	4.500	1146

PERFORMANCE

	In	Out
Inclination (deg)	48.80	48.80
Azimuth (deg)	264.24	264.24

	Distance (m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :	0.00	0			
Rotated :	8.20	0			
Total :	8.20	4	0.00	-0.01	0.00

COMMENTS

sperry-sun
DRILLING SERVICES

BHA Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 9

BHA# 9 : Date In 21/03/19 MD In (m) : 1471 TVD In (m) : 1311 Date Out 22/03/199 MD Out (m): 1478 TVD Out (m): 1316

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
5rr3	9.500	Corpro	CM459EE	08763			- - - - - - -

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Core Head	08763	9.500	5.250	12.250	167.79		0.39	
2	CoreBarrel		9.500	7.000	12.210	110.41	B 6-5/8" Reg	13.56	
3	Non-Mag Drill collar	6849	8.000	2.810		150.17	B 6-5/8" Reg	8.93	
4	2x Drill collar		8.000	3.000		147.00	B 6-5/8" Reg	18.40	
5	Cross Over Sub		6.500	2.810		91.95	B 4" IF	0.72	
6	Cross Over Sub		6.125	2.625		81.97	B 4-1/2" IF	0.49	
7	24x HWDP - 4½" IF		5.000	3.000		49.30	B 4-1/2" IF	218.64	
8	Drilling Jar 4½" IF	1416-1128	6.375	2.750		88.54	B 4-1/2" IF	9.83	
9	6x HWDP - 4½" IF		4.500	2.750		41.00	B 4-1/2" IF	54.37	
10	Cross Over Sub		5.000	3.000		42.83	B 4" IF	0.52	
								325.85	

Parameter		Min	Max	Ave
WOB (klbs)	:	10	25	11
RPM (rpm)	:	60	80	61
Flow (gpm)	:	399	776	416
SPP (psi)	:	500	2050	568

Activity	Hrs
Drilling :	1.00
Reaming :	0.00
Circ-Other :	0.50
Total :	1.50

BHA Weight	(lb)
in Air (Total) :	64355
in Mud (Total) :	55331
in Air (Bel Jars :	54113
in Mud (Bel Jars :	46525

Drill String	OD(in)	Len (m)
DP(G)-NC46(XH)-16.60#	4.500	1152

PERFORMANCE

	In	Out
Inclination (deg)	48.80	48.80
Azimuth (deg)	264.24	264.23

	Distance (m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :	0.00	0			
Rotated :	6.80	7			
Total :	6.80	7	0.00	-0.01	0.00

COMMENTS

sperry-sun
DRILLING SERVICES
Survey and Drilling Parameters

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Rig : Rig 30

Country : Australia
Lease : PPL 2 Otway Basin
Job # : AU-DD-90018

North Ref : Grid **Declination** : ° **VS Dir** : 263.01° (from 0.0N, 25.0E)

WELLBORE SURVEY										DRILLING PARAMETERS									
Measured Depth (m)	Incl Angle (deg)	Azi Dir (deg)	Vertical Depth (m)	Vertical Section (m)	Coordinates N/S (m)	Coordinates E/W (m)	DLS (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)	WOB (klbs)	RPM	Flow Rate (gpm)	Stand Pipe (psi)	Orientation From (m)	Orientation To (m)	Tool Face (deg)	ROP (m/hr)	BHA No. (#)	Comment
0.00	0.00	0.00	0.0	0.0	0.0	25.0	0.00	0.00	0.00										Tieon
40.00	0.08	133.55	40.0	0.0	0.0	25.0	0.06	0.06	0.00									1	
70.00	0.06	110.34	70.0	0.0	0.0	25.1	0.03	-0.02	0.00									1	
100.00	0.07	141.16	100.0	-0.1	-0.1	25.1	0.04	0.01	0.00									1	
130.00	0.09	146.80	130.0	-0.1	-0.1	25.1	0.00	0.02	0.00									1	
160.00	0.07	136.86	160.0	-0.1	-0.1	25.1	0.00	-0.02	0.00									1	
190.00	0.10	134.04	190.0	-0.1	-0.2	25.2	0.03	0.03	0.00									1	
220.00	0.14	130.12	220.0	-0.2	-0.2	25.2	0.04	0.04	0.00									1	
250.00	0.13	125.13	250.0	-0.2	-0.2	25.3	0.00	-0.01	0.00									1	
280.00	0.11	124.29	280.0	-0.3	-0.3	25.3	0.00	-0.02	0.00									1	
310.00	0.07	145.14	310.0	-0.3	-0.3	25.3	0.05	-0.04	0.00									1	
340.00	0.09	134.48	340.0	-0.3	-0.3	25.4	0.00	0.02	0.00									1	
370.00	0.08	179.44	370.0	-0.3	-0.4	25.4	0.07	-0.01	0.00									1	
400.00	0.09	169.65	400.0	-0.3	-0.4	25.4	0.00	0.01	0.00									1	
430.00	0.17	174.30	430.0	-0.3	-0.5	25.4	0.08	0.08	0.00									1	
461.30	0.22	162.60	461.3	-0.4	-0.6	25.4	0.06	0.05	0.00									1	
489.60	0.38	202.23	489.6	-0.3	-0.7	25.4	0.27	0.17	0.00									1	
518.00	0.21	179.25	518.0	-0.3	-0.9	25.4	0.22	-0.18	0.00									1	
546.40	0.19	178.12	546.4	-0.3	-1.0	25.4	0.00	-0.02	0.00									1	
575.00	0.16	180.84	575.0	-0.2	-1.1	25.4	0.03	-0.03	0.00									1	
613.50	0.27	212.16	613.5	-0.2	-1.2	25.3	0.12	0.09	0.00									1	
632.00	0.23	267.89	632.0	-0.1	-1.2	25.3	0.38	-0.06	0.00									1	
660.60	1.48	271.59	660.6	0.3	-1.2	24.8	1.31	1.31	0.00	5		560	750	659	661	HS	10	3	
689.00	4.16	271.34	689.0	1.7	-1.2	23.4	2.83	2.83	-0.26	5		650	900	661	674	HS	10	3	
														678	682	HS		3	
														688	689	HS		3	
717.60	6.74	272.04	717.4	4.4	-1.1	20.7	2.71	2.71	0.73	5		650	900	689	693	HS	20	3	
														698	703	HS		3	
														707	711	HS		3	

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DRILLING SERVICES

BHA Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

BHA# 10

BHA# 10 : Date In 22/03/19 MD In (m) : 1478 TVD In (m) : 1316 Date Cur 23/03/199 MD Cur (m): 1560 TVD Cur (m): 1370

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
4rr1	12.250	Security DBS	ERA-03D	681061	3x18	0.746	

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Security ERA-03D	681061	12.250		12.250		P 6-5/8" Reg	0.36	
2	Integral Blade Stabiliser- Near Bit	47602	8.250	2.810	12.250	161.04	B 6-5/8" Reg	2.13	1.36
3	Non-Mag Drill collar	6849	8.000	2.810		150.17	B 6-5/8" Reg	8.93	
4	Integral Blade Stabiliser	47608	8.250	2.810	12.250	161.04	B 6-5/8" Reg	2.20	12.52
5	2x Drill collar		8.000	3.000		147.00	B 6-5/8" Reg	18.40	
6	Cross Over Sub		6.500	2.810		91.95	B 4" IF	0.72	
7	Cross Over Sub		6.125	2.625		81.97	B 4-1/2" IF	0.49	
8	24x HWDP - 4½" IF		5.000	3.000		49.30	B 4-1/2" IF	218.64	
9	Drilling Jar 4½" IF	1416-1128	6.375	2.750		88.54	B 4-1/2" IF	9.83	
10	6x HWDP - 4½" IF		4.500	2.750		41.00	B 4-1/2" IF	54.37	
11	Cross Over Sub		5.000	3.000		42.83	B 4" IF	0.52	
								316.59	

Parameter		Min	Max	Ave
WOB (klbs)	:	25	25	25
RPM (rpm)	:	80	80	80
Flow (gpm)	:	776	776	776
SPP (psi)	:	2050	2050	2050

Activity	Hrs
Drilling :	9.50
Reaming :	1.00
Circ-Other :	1.50
Total :	12.00

BHA Weight	(lb)
in Air (Total) :	
in Mud (Total) :	
in Air (Bel Jars :	0
in Mud (Bel Jars :	0

Drill String	OD(in)	Len (m)
DP(G)-NC46(XH)-16.60#	4.500	1243

PERFORMANCE

	In	Out
Inclination (deg)	48.80	48.80
Azimuth (deg)	264.23	264.20

	Distance (m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :	0.00	0			
Rotated :	81.70	9			
Total :	81.70	9	0.00	-0.01	0.01

COMMENTS

Drill to TD

908910 189

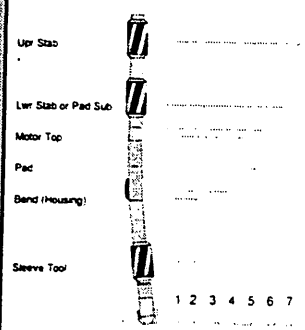
sperry-sun DRILLING SERVICES

MOTOR PERFORMANCE REPORT

M-AU-DD-90018-3

Motor Serial #	800177	**Job #**	AU-DD-90018
Directional Driller(s)	Bernie Wood, Dave Hayes	**Customer**	Western Underground Gas Storage Pty Ltd
Location	PPL 2 Otway Basin	**Rig**	Rig 30
Well	Iona 4	**Bit Run #**	2rr1 **BHA #** : 3 **Motor Run #** : 1
Depth In/Out	639 / 1381 *m*	**Date In/Out**	12/03/1999 / 17/03/1999 **Hole Size** : 12.250 *in*
Application Details	Steerable Drilling		

MOTOR CONFIGURATION



	From Bit *(m)*	Component		Type	Diam In/Out *(in)*
1	1.18	Sleeve Stab/Pad	Yes	Stab: 1.0°	12.062 12.000
2	3.12	Bent Housing	Yes	Non-Adjustable 1.50° bend	
3		Housing Tool Used	No		
4	9.97	Stator Elastomer	Nitrile		
5		Bent Sub / 2nd Bent Hsg	No		
6	10.90	Lower String Stab	Yes	Stab	11.500 11.500
7		Upper String Stab	No		

Additional Features :

Flex Collar : No **Short Brg Pack** : No **Rtr Noz / Size** : /32's **BHA OD/ID** : 8.063 / 3.000 *in*

Brg Cfg (Off/On) : **Lobe Cfg** : 6/7

	Arr	Ret
Pick Up Sub	Yes	Yes
Bit Box Protr	Yes	Yes

MOTOR RUN DATA

Max Dogleg While Rotating	2.00 °/30m	**RPM**	80	**Motor Stalled**	No
Max Dogleg Overpulled In	°/30m	**Force**	*lbf*	**Float Valve**	Yes
Max Dogleg Pushed Through	°/30m	**Force**	*lbf*	**DP Filter**	No
Hole Azimuth Start / End	270.39° / 264.30°	**Inc Start / End**	0.54° / 48.80°		
Interval Oriented / Rot.	239 / 503 *m*	**Directional Perf Ori / Rot**	/ °/30m		
Jarring Occured : No					

	Prev Job/Well Hrs	0.00
	Drilling Hrs	83.50
	Circ Hrs	9.00
	Reaming Hrs	0.00
	Total Hrs This Run	92.50
	New Cumulative Hrs	92.50

	Diff Press *(psi)*	Str RPM	Rotn Torque *(ft-lbs)*	Drag Up/Dn *(lbf)*	WOB *(klbs)*	ROP Oriented *(m/hr)*	ROP Rotated *(m/hr)*
Avg	62	74		10 / 10	15	6	10
Max	150	80		10 / 10	45	20	30

PRE-RUN TESTS

Motor Tested Pre-Run : No **with** :

Dump Sub Operating : Yes **Brg Play** : 1.0 *mm*

Flow 1 : *gpm* **Pressure 1** : *psi*

Flow 2 : *gpm* **Pressure 2** : *psi*

Driveshaft Rotation Observed : No

Bearing Leakage Observed : No

POST-RUN TESTS

Motor Tested Post-Run : No **with** :

Dump Sub Operating : Yes **Brg Play** : 3.0 *mm*

Flow 1 : *gpm* **Pressure 1** : *psi*

Flow 2 : *gpm* **Pressure 2** : *psi*

Driveshaft Rotation Observed : Yes

Bearing Leakage Observed : Yes

Driveshaft Rotated to Drain Mud : Yes

Fluid Flushed : Yes **Fluid Used** : Water

MUD DATA

Base : Water **Additives** :

% Oil/Water : 0.00 / 96.00 **% Solids** : 3.70 **% Sand** : 0.30 **Mud Wt** : 9.0 *ppg* **PV** : 11 *cp* **SPP Start/End** : 720 / 1600 *psi*

DH Temp Avg/Max : 43.1 / 54.0 **FlowRate Avg/Max** : 735 / 760 *gpm* **YP** : 27.0 *lbf/100ft²* **pH** : 8.3

Principle Formation Name(s) : Pebble Point Fm, Paaratte Formation, Skull Creek Member **Lithology** : **Chloride Content** : 22000 *ppm*

BIT DATA

Make : Security **Type** : ERA-03 **Serial #** : 679091

Prev Drilling Hrs : 0.00 **Prev Reaming Hrs** : 4.50 **No of Runs This Bit** : 2

Jet Sizes *(/32's)* : 3x24 **TFA** : 1.325 *in²* **Gage Length** : 1.000 *in*

Dull Grade	1	2	3	4	5	6	7	8
In	1	1	WT	A	E	I	NO	BHA
Out	5	5	WT	A	E	3	SD	CP

PERFORMANCE COMMENTS

Problem Perceived : No **Problem Date** : **Service Interrupt** : No **Service Interrupt Hrs** :

Performance Motor : Yes **Tandem Motor** : No **LIH** : No **PPR Ref #** :

Motor performed to specification

Customer Representative's Signature (optional) : ..... **Date:** .....

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DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty Ltd
Well :	Iona 4
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	Rig 30
Job # :	AU-DD-90018

CURRENT STATUS Report # 1 01/03/1999

Total Depth	(m)	: 5	Casing Depth	(m)	: 0.00	Operator Reps	: Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	: 0	Casing Diameter	(in)	: 0.000	SSDS Reps	: Dave Hayes (1)
Hole Size	(in)	:	Casing ID	(in)	:		

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
0.00	0.00	0.00	0.00	0.00	N00.00E

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)

BHA SUMMARY

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	8.9	64	20	18.0	4.0 / 7.0	7	8.5	3.20	0.75	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:00	24.00	5.00		Rig Up / Tear Down

COMMENTS

Dave Hayes Perth - Melbourne

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

CURRENT STATUS Report # 2 02/03/1999

Total Depth	(m)	:	5	Casing Depth	(m)	:	0.00
Drilled last 24 hrs	(m)	:	0	Casing Diameter	(in)	:	0.000
Hole Size	(in)	:		Casing ID	(in)	:	

Operator Reps : Wally Westman, Ian Zurakowski
SSDS Reps : Dave Hayes (2)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
0.00	0.00	0.00	0.00	0.00	N00.00E

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)

BHA SUMMARY

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	8.9	64	20	18.0	4.0 / 7.0	7	8.5	3.20	0.75	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:00	24.00	5.00		Rig Up / Tear Down

COMMENTS

Dave Hayes to site.
Pre spud meeting.

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty Ltd
Well :	Iona 4
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	Rig 30
Job # :	AU-DD-90018

CURRENT STATUS Report # 3 03/03/1999

Total Depth	(m)	: 5	Casing Depth	(m)	: 0.00	Operator Reps	: Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	: 0	Casing Diameter	(in)	: 0.000	SSDS Reps	: Dave Hayes (3)
Hole Size	(in)	:	Casing ID	(in)	:		

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
0.00	0.00	0.00	0.00	0.00	N00.00E

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)

BHA SUMMARY

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	8.9	64	20	18.0	4.0 / 7.0	7	8.5	3.20	0.75	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:00	24.00	5.00		Rig Up / Tear Down

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

CURRENT STATUS Report # 4 04/03/1999

Total Depth	(m)	:	5	Casing Depth	(m) :	0.00	Operator Reps : Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	:	0	Casing Diameter	(in) :	0.000	SSDS Reps : Dave Hayes (4)
Hole Size	(in)	:		Casing ID	(in) :		

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
0.00	0.00	0.00	0.00	0.00	N00.00E

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)

BHA SUMMARY

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	8.9	64	20	18.0	4.0 / 7.0	7	8.5	3.20	0.75	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:00	24.00	5.00		Rig Up / Tear Down

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

CURRENT STATUS Report # 5 05/03/1999

Total Depth	(m)	:	5	Casing Depth	(m)	:	0.00	Operator Reps : Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	:	0	Casing Diameter	(in)	:	0.000	SSDS Reps : Dave Hayes (5)
Hole Size	(in)	:		Casing ID	(in)	:		

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
0.00	0.00	0.00	0.00	0.00	N00.00E

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)

BHA SUMMARY

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	8.9	64	20	18.0	4.0 / 7.0	7	8.5	3.20	0.75	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:00	24.00	5.00		Rig Up / Tear Down

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty Ltd
Well :	Iona 4
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	Rig 30
Job # :	AU-DD-90018

CURRENT STATUS Report # 6 06/03/1999

Total Depth	(m)	:	23	Casing Depth	(m)	:	20.00	Operator Reps : Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	:	18	Casing Diameter	(in)	:	20.000	SSDS Reps : Dave Hayes (6)
Hole Size	(in)	:	17.500	Casing ID	(in)	:		

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
0.00	0.00	0.00	0.00	0.00	N00.00E

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)

BHA SUMMARY

BHA 1: 342.98 m; Bit #1 (2.5 hrs), Sub, DC, DC, Stab, 4x DC, Sub, Jar, Sub, HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	8.9	64	20	18.0	4.0 / 7.0	7	8.5	3.20	0.75	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	21:00	21.00	5.00		Rig Up / Tear Down
21:00	21:15	0.25	5.00		Misc- Safety meeting prior to drilling
21:15	21:30	0.25	5.00	1	Trip In - P/U BHA #1
21:30	00:00	2.50	23.00	1	Drilling 17½" OH

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

CURRENT STATUS Report # 7 07/03/1999

Total Depth	(m)	:	421	Casing Depth	(m)	:	20.00	Operator Reps : Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	:	398	Casing Diameter	(in)	:	20.000	SSDS Reps : Dave Hayes (7), Bernie Wood (1)
Hole Size	(in)	:	17.500	Casing ID	(in)	:		

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
400.00	0.09	169.65	400.00	0.58	S43.05E

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Dilwyn Formation	339.00	339.00

BHA SUMMARY

BHA 1: 342.98 m; Bit #1 (26.5 hrs), Sub, DC, DC, Stab, 4x DC, Sub, Jar, Sub, HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	9.0	45	10	17.0	7.0 / 11.0	8	8.0	3.70	1.00	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:00	24.00	421.00	1	Drilling, circ & survey 17½" OH

COMMENTS

B Wood arrives Melbourne

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty Ltd
Well :	Iona 4
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	Rig 30
Job # :	AU-DD-90018

CURRENT STATUS Report # 8 08/03/1999

Total Depth	(m)	:	639	**Casing Depth**	(m)	:	504.15
Drilled last 24 hrs	(m)	:	218	**Casing Diameter**	(in)	:	13.375
Hole Size	(in)	:	17.500	**Casing ID**	(in)	:	12.615

Operator Reps : Wally Westman, Ian Zurakowski
SSDS Reps : Bernie Wood (2), Dave Hayes (8)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
632.00	0.23	267.89	632.00	1.26	S12.22E

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Pebble Point Fmt	603.00	603.00

BHA SUMMARY

BHA 1: 342.98 m; Bit #1 (43. hrs), Sub, DC, DC, Stab, 4x DC, Sub, Jar, Sub, HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	9.0	45	10	17.0	7.0 / 11.0	8	8.0	3.70	1.00	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	16:30	16.50	639.00	1	Drilling, circulate & survey as required
16:30	20:00	3.50	639.00	1	Trip Out
20:00	22:30	2.50	639.00	1	Trip In
22:30	00:00	1.50	639.00	1	Circulate hole clean

COMMENTS

Bernie Wood to location

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

CURRENT STATUS Report # 9 09/03/1999

Total Depth	(m)	:	639	Casing Depth	(m)	:	504.15
Drilled last 24 hrs	(m)	:	0	Casing Diameter	(in)	:	13.375
Hole Size	(in)	:	17.500	Casing ID	(in)	:	12.615

Operator Reps : Wally Westman, Ian Zurakowski
SSDS Reps : Bernie Wood (3), Dave Hayes (9)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
632.00	0.23	267.89	632.00	1.26	S12.22E

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Pebble Point Fmt	603.00	603.00

BHA SUMMARY

BHA 1: 342.98 m; Bit #1 (43. hrs), Sub, DC, DC, Stab, 4x DC, Sub, Jar, Sub, HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	9.0	45	10	17.0	7.0 / 11.0	8	8.0	3.70	1.00	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:30	0.50	639.00	1	Circulate hole clean
00:30	03:45	3.25	639.00	1	Trip Out
03:45	04:00	0.25	639.00	1	Trip Out (at Surface)
04:00	12:30	8.50	639.00		Run Casing / Cement
12:30	00:00	11.50	639.00		Hole Problems- casing stuck at 504 meters.

COMMENTS

908910 199

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty Ltd
Well :	Iona 4
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	Rig 30
Job # :	AU-DD-90018

CURRENT STATUS Report # 10 10/03/1999

Total Depth	(m)	:	639	Casing Depth	(m) :	504.15	Operator Reps : Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	:	0	Casing Diameter	(in) :	13.375	SSDS Reps : Bernie Wood (4), Dave Hayes (10)
Hole Size	(in)	:		Casing ID	(in) :	12.615	

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
632.00	0.23	267.89	632.00	1.26	S12.22E

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Pebble Point Fmt	603.00	603.00

BHA SUMMARY

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	9.0	45	10	17.0	7.0 / 11.0	8	8.0	3.70	1.00	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	06:00	6.00	639.00		Hole Problems- casing stuck at 504 meters.
06:00	10:30	4.50	639.00		Cement
10:30	15:00	4.50	639.00		Wait on Cement
15:00	00:00	9.00	639.00		Nipple Up BOP

COMMENTS

908910 200

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

CURRENT STATUS Report # 11 11/03/1999

Total Depth	(m)	:	639	Casing Depth	(m)	:	504.15	Operator Reps : Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	:	0	Casing Diameter	(in)	:	13.375	SSDS Reps : Bernie Wood (5), Dave Hayes (11)
Hole Size	(in)	:	12.250	Casing ID	(in)	:	12.615	

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
632.00	0.23	267.89	632.00	1.26	S12.22E

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Pebble Point Fmt	603.00	603.00

BHA SUMMARY

BHA 2: 340.06 m; Bit #2 (0.5 hrs), Sub, DC, DC, 4x DC, Sub, Sub, Jar, 30x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	9.0	45	10	17.0	7.0 / 11.0	8	8.0	3.70	1.00	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	13:00	13.00	639.00		Nipple Up BOP
13:00	19:00	6.00	639.00		Test BOP
19:00	19:30	0.50	639.00		Misc- install wear bushing
19:30	20:00	0.50	639.00		PU/LD BHA
20:00	23:30	3.50	639.00	2	Trip In- tag cement at 490m
23:30	00:00	0.50	639.00	2	Drill Cement & shoetrack

COMMENTS

908910 201

sperry-sun DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

CURRENT STATUS Report # 12 12/03/1999

Total Depth	(m)	:	650	Casing Depth	(m)	:	504.15	Operator Reps : Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	:	11	Casing Diameter	(in)	:	13.375	SSDS Reps : Bernie Wood (6), Dave Hayes (12)
Hole Size	(in)	:	12.250	Casing ID	(in)	:	12.615	

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
632.00	0.23	267.89	632.00	1.26	S12.22E

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Pebble Point Fmt	603.00	603.00

BHA SUMMARY

BHA 2: 340.06 m; Bit #2 (4.5 hrs), Sub, DC, DC, 4x DC, Sub, Sub, Jar, 30x HWDP, Sub
BHA 3: 315.97 m; Bit #2rr1 (6. hrs), PDM #1 (3. hrs), Stab, Sub, MWD, DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	8.6	56	9	17.0	6.0 / 8.0	9	8.2	1.60	0.01	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	02:30	2.50	639.00	2	Drill Cement to 512.83m
02:30	03:30	1.00	639.00	2	Circulate hole clean
03:30	04:30	1.00	639.00	2	FIT
04:30	06:00	1.50	639.00	2	Reaming / Washing to 531m (RIH to 629m)
06:00	07:00	1.00	639.00	2	Circulate hole clean
07:00	07:30	0.50	639.00	2	Trip Out to shoe
07:30	09:30	2.00	639.00	2	Circulate, dump contaminated mud
09:30	12:00	2.50	639.00	2	Trip Out (at Surface)
12:00	13:30	1.50	639.00	2	PU/LD BHA #2, LD 8" DC's
13:30	16:30	3.00	639.00	3	PU/LD BHA #3
16:30	19:00	2.50	639.00	3	Trip In
19:00	20:30	1.50	639.00	3	Circulate to new mud
20:30	21:30	1.00	639.00	3	Trip Out to shoe
21:30	22:00	0.50	639.00	3	FIT
22:00	22:30	0.50	639.00	3	Trip In
22:30	00:00	1.50	650.00	3	Drilling to 650m

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty Ltd
Well :	Iona 4
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	Rig 30
Job # :	AU-DD-90018

CURRENT STATUS Report # 13 13/03/1999

Total Depth	(m)	:	906	**Casing Depth**	(m)	:	504.15
Drilled last 24 hrs	(m)	:	256	**Casing Diameter**	(in)	:	13.375
Hole Size	(in)	:	12.250	**Casing ID**	(in)	:	12.615

Operator Reps : Wally Westman, Ian Zurakowski
SSDS Reps : Bernie Wood (7), Dave Hayes (13)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
888.60	23.93	262.15	881.43	50.36	S82.53W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Paararte Formation	672.00	671.99

BHA SUMMARY

BHA 3: 315.97 m; Bit #2rr1 (26.5 hrs), PDM #1 (24.5 hrs), Stab, Sub, MWD, DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	8.7	51	12	24.0	10.0 / 12.0	7	8.5	1.70	1.50	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	11:30	11.50	783.00	3	Drilling
11:30	11:45	0.25	783.00	3	Circulate
11:45	12:15	0.50	783.00	3	Short Trip, pull 5 stds
12:15	12:45	0.50	783.00	3	Circulate btms up from rathole
12:45	13:15	0.50	783.00	3	Short Trip in
13:15	13:30	0.25	783.00	3	Circulate, change shaker screen
13:30	21:00	7.50	887.00	3	Drilling
21:00	22:30	1.50	887.00	3	Rig Repair
22:30	00:00	1.50	906.00	3	Drilling

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty Ltd
Well :	Iona 4
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	Rig 30
Job # :	AU-DD-90018

CURRENT STATUS Report # 14 14/03/1999

Total Depth	(m)	:	1058	Casing Depth	(m)	:	504.15	Operator Reps : Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	:	152	Casing Diameter	(in)	:	13.375	SSDS Reps : Bernie Wood (8), Dave Hayes (14)
Hole Size	(in)	:	12.250	Casing ID	(in)	:	12.615	

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1031.10	35.13	264.14	1005.49	120.01	S82.21W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Skull Creek Member	1029.00	1003.77

BHA SUMMARY

BHA 3: 315.97 m; Bit #2rr1 (44.5 hrs), PDM #1 (45. hrs), Stab, Sub, MWD, DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	8.7	51	12	24.0	10.0 / 12.0	7	8.5	1.70	1.50	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	01:30	1.50	920.00	3	Drilling
01:30	03:00	1.50	920.00	3	Rig Repair- mud pump #1
03:00	04:00	1.00	935.00	3	Drilling
04:00	04:30	0.50	935.00	3	Circulate
04:30	05:00	0.50	935.00	3	Short Trip to 628m
05:00	06:00	1.00	935.00	3	Circulate 628 - 640m
06:00	07:00	1.00	935.00	3	Short Trip to 935m
07:00	11:00	4.00	963.00	3	Drilling
11:00	12:00	1.00	963.00	3	Circulate, change shaker screens
12:00	20:30	8.50	1041.00	3	Drilling
20:30	21:00	0.50	1041.00	3	Rig Repair- mud pump #2
21:00	00:00	3.00	1058.00	3	Drilling

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

CURRENT STATUS Report # 15 15/03/1999

Total Depth	(m)	:	1153	Casing Depth	(m)	:	504.15	Operator Reps : Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	:	95	Casing Diameter	(in)	:	13.375	SSDS Reps : Bernie Wood (9), Dave Hayes (15)
Hole Size	(in)	:	12.250	Casing ID	(in)	:	12.615	

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1152.66	46.30	262.70	1096.27	200.54	S82.93W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Skull Creek Member	1029.00	1003.77

BHA SUMMARY

BHA 3: 315.97 m; Bit #2rr1 (58.5 hrs), PDM #1 (61.5 hrs), Stab, Sub, MWD, DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	8.7	51	12	24.0	10.0 / 12.0	7	8.5	1.70	1.50	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	01:30	1.50	1065.00	3	Drilling
01:30	03:30	2.00	1065.00	3	Rig Repair, mud manifold
03:30	04:30	1.00	1067.00	3	Drilling
04:30	06:30	2.00	1067.00	3	Rig Repair, mud manifold
06:30	18:00	11.50	1153.00	3	Drilling
18:00	19:00	1.00	1153.00	3	Circulate HiVis
19:00	20:00	1.00	1153.00	3	Circulate, pump down Gyro
20:00	20:30	0.50	1153.00	3	Circulate pump slug
20:30	23:00	2.50	1153.00	3	Trip Out to shoe taking Gyro shots
23:00	00:00	1.00	1153.00	3	Cut Drill Line

COMMENTS

908910 205

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty Ltd
Well :	Iona 4
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	Rig 30
Job # :	AU-DD-90018

CURRENT STATUS Report # 16 16/03/1999

Total Depth	(m)	:	1356	Casing Depth	(m)	:	504.15	Operator Reps : Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	:	203	Casing Diameter	(in)	:	13.375	SSDS Reps : Bernie Wood (10), Dave Hayes (16)
Hole Size	(in)	:	12.250	Casing ID	(in)	:	12.615	

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1323.70	45.70	263.60	1213.31	325.25	S83.02W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Nullawarre Greensand	1218.00	1140.69

BHA SUMMARY

BHA 3: 315.97 m; Bit #2rr1 (81.5 hrs), PDM #1 (84.5 hrs), Stab, Sub, MWD, DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	8.9	50	12	30.0	11.0 / 19.0	6	8.5	3.20	0.50	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	01:00	1.00	1153.00	3	Trip In- wash last single to bottom
01:00	00:00	23.00	1356.00	3	Drilling

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty Ltd
Well :	Iona 4
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	Rig 30
Job # :	AU-DD-90018

CURRENT STATUS Report # 17 17/03/1999

Total Depth	(m)	:	1381	Casing Depth	(m)	:	504.15
Drilled last 24 hrs	(m)	:	25	Casing Diameter	(in)	:	13.375
Hole Size	(in)	:	12.250	Casing ID	(in)	:	12.615

Operator Reps : Wally Westman, Ian Zurakowski
SSDS Reps : Bernie Wood (11), Dave Hayes (17)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1381.00	48.80	264.30	1251.82	367.66	S83.15W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Belfast Mudstone	1373.00	1246.55

BHA SUMMARY

BHA 3: 315.97 m; Bit #2rr1 (88. hrs), PDM #1 (92.5 hrs), Stab, Sub, MWD, DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub
BHA 4: 325.85 m; Bit #3 (5. hrs), Other, DC, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	9.0	51	11	27.0	10.0 / 18.0	6	8.3	3.70	0.30	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	06:30	6.50	1381.00	3	Drilling to core point
06:30	07:30	1.00	1381.00	3	Circulate
07:30	09:30	2.00	1381.00	3	Trip Out
09:30	10:00	0.50	1381.00	3	Circulate 17½" rathole 618 - 630m.
10:00	12:00	2.00	1381.00	3	Trip Out (at Surface)
12:00	14:30	2.50	1381.00	3	PU/LD BHA #3
14:30	17:00	2.50	1381.00	4	PU/LD BHA #4
17:00	19:00	2.00	1381.00	4	Trip In, held up at 656m
19:00	00:00	5.00	1381.00	4	Reaming / Washing

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty Ltd
Well :	Iona 4
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	Rig 30
Job # :	AU-DD-90018

CURRENT STATUS Report # 18 18/03/1999

Total Depth	(m)	:	1382	**Casing Depth**	(m)	:	504.15	**Operator Reps** : Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	:	1	**Casing Diameter**	(in)	:	13.375	**SSDS Reps** : Bernie Wood (12)
Hole Size	(in)	:	12.250	**Casing ID**	(in)	:	12.615	

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1381.00	48.80	264.30	1251.82	367.66	S83.15W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Belfast Mudstone	1373.00	1246.55

BHA SUMMARY

BHA 4: 325.85 m; Bit #3 (28.75 hrs), Other, DC, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	9.1	55	13	28.0	10.0 / 18.0	6	8.5	4.20	0.75	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	21:45	21.75	1381.00	4	Reaming / Washing
21:45	22:00	0.25	1381.00	4	Circulate, drop ball
22:00	00:00	2.00	1382.00	4	Coring

COMMENTS

908910 208

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

CURRENT STATUS Report # 19 19/03/1999

Total Depth	(m)	:	1439	Casing Depth	(m)	:	504.15
Drilled last 24 hrs	(m)	:	57	Casing Diameter	(in)	:	13.375
Hole Size	(in)	:	12.250	Casing ID	(in)	:	12.615

Operator Reps : Wally Westman, Ian Zurakowski
SSDS Reps : Bernie Wood (13)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1381.00	48.80	264.30	1251.82	367.66	S83.15W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Waarre D Unit	1429.01	1283.44

BHA SUMMARY

BHA 4: 325.85 m; Bit #3 (32.25 hrs), Other, DC, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub
BHA 5: 316.25 m; Bit #4 (7.5 hrs), Stab, DC, Stab, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	9.1	52	13	25.0	9.0 / 17.0	6	8.5	4.20	0.50	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	03:30	3.50	1383.00	4	Coring
03:30	04:00	0.50	1383.00	4	Circulate
04:00	08:00	4.00	1383.00	4	Trip Out (at Surface)
08:00	09:00	1.00	1383.00	4	Lay out core
09:00	09:30	0.50	1383.00	4	Service Rig
09:30	10:00	0.50	1383.00	4	PU/LD BHA #4
10:00	11:00	1.00	1383.00	5	PU/LD BHA #5
11:00	13:00	2.00	1383.00	5	Trip In
13:00	14:00	1.00	1383.00	5	Cut Drill Line
14:00	16:30	2.50	1383.00	5	Trip In
16:30	00:00	7.50	1439.00	5	Drilling

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

CURRENT STATUS Report # 20 20/03/1999

Total Depth	(m)	:	1455	Casing Depth	(m)	:	504.15
Drilled last 24 hrs	(m)	:	16	Casing Diameter	(in)	:	13.375
Hole Size	(in)	:	12.250	Casing ID	(in)	:	12.615

Operator Reps : Wally Westman, Ian Zurakowski
SSDS Reps : Bernie Wood (14)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1381.00	48.80	264.30	1251.82	367.66	S83.15W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Waarre D Unit	1429.01	1283.44

BHA SUMMARY

BHA 5: 316.25 m; Bit #4 (8.5 hrs), Stab, DC, Stab, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub
BHA 6: 325.85 m; Bit #5 (3. hrs), Other, DC, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub
BHA 7: 325.85 m; Bit #5rr1 (5. hrs), Other, DC, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	9.2	52	13	24.0	9.0 / 20.0	6	8.5	4.80	0.50	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	01:00	1.00	1448.50	5	Drilling
01:00	02:30	1.50	1448.50	5	Circulate
02:30	04:30	2.00	1448.50	5	Trip Out
04:30	05:00	0.50	1448.50	5	Circulate @ 619m
05:00	07:00	2.00	1448.50	5	Trip Out (at Surface)
07:00	08:30	1.50	1448.50	6	PU/LD BHA #6
08:30	11:30	3.00	1448.50	6	Trip In
11:30	12:00	0.50	1448.50	6	Circulate
12:00	15:00	3.00	1455.00	6	Coring
15:00	19:00	4.00	1455.00	6	Trip Out (at Surface)
19:00	21:00	2.00	1455.00	6	PU/LD core & redress
21:00	00:00	3.00	1455.00	7	Trip In

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty Ltd
Well : Iona 4
Country : Australia
Lease : PPL 2 Otway Basin
Rig : Rig 30
Job # : AU-DD-90018

CURRENT STATUS Report # 21 21/03/1999

Total Depth	(m)	:	1471	Casing Depth	(m) :	504.15	Operator Reps : Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	:	16	Casing Diameter	(in) :	13.375	SSDS Reps : Bernie Wood (15)
Hole Size	(in)	:	12.250	Casing ID	(in) :	12.615	

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1466.00	48.80	264.24	1307.81	431.61	S83.31W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
Waarre C1 Sand	1466.00	1307.81

BHA SUMMARY

BHA 7: 325.85 m; Bit #5rr1 (5. hrs), Other, DC, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub
BHA 8: 325.85 m; Bit #5rr2 (7. hrs), Other, DC, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub
BHA 9: 325.85 m; Bit #5rr3 (8. hrs), Other, DC, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	9.2	52	13	24.0	9.0 / 20.0	6	8.5	4.80	0.50	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	01:30	1.50	1455.00	7	Circulate
01:30	03:30	2.00	1463.30	7	Coring
03:30	07:00	3.50	1463.30	7	Trip Out (at Surface)
07:00	09:00	2.00	1463.30	7	PU/LD Core
09:00	09:30	0.50	1463.30	7	Service Rig
09:30	12:30	3.00	1463.30	8	Trip In
12:30	13:00	0.50	1463.30	8	Circulate
13:00	15:00	2.00	1471.50	8	Coring
15:00	18:30	3.50	1471.50	8	Trip Out (at Surface)
18:30	20:00	1.50	1471.50	8	PU/LD Core
20:00	22:00	2.00	1471.50	9	Trip In
22:00	22:30	0.50	1471.50	9	Cut Drill Line
22:30	00:00	1.50	1471.50	9	Trip In

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty Ltd
Well :	Iona 4
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	Rig 30
Job # :	AU-DD-90018

CURRENT STATUS Report # 22 22/03/1999

Total Depth	(m)	: 1560	Casing Depth	(m)	: 504.15	Operator Reps	:	Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	: 89	Casing Diameter	(in)	: 13.375	SSDS Reps	:	Bernie Wood (16)
Hole Size	(in)	: 12.250	Casing ID	(in)	: 12.615			

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1560.00	48.80	264.20	1369.72	502.33	S83.44W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
TD	1560.00	1369.72

BHA SUMMARY

BHA 9: 325.85 m; Bit #5rr3 (8. hrs), Other, DC, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub
BHA 10: 316.59 m; Bit #4rr1 (19. hrs), Stab, DC, Stab, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	9.2	49	11	19.0	7.0 / 22.0	6	8.5	5.20	0.50	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:30	0.50	1471.50	9	Circulate
00:30	01:30	1.00	1478.30	9	Coring
01:30	05:00	3.50	1478.30	9	Trip Out (at Surface)
05:00	06:30	1.50	1478.30	9	PU/LD Core
06:30	07:00	0.50	1478.30	9	Service Rig
07:00	08:30	1.50	1478.30	10	PU/LD BHA
08:30	11:30	3.00	1478.30	10	Trip In
11:30	12:30	1.00	1478.30	10	Reaming / Washing
12:30	13:30	1.00	1478.30	10	Rig Repair, pumps
13:30	23:00	9.50	1560.00	10	Drilling
23:00	00:00	1.00	1560.00	10	Circulate

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty Ltd
Well :	Iona 4
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	Rig 30
Job # :	AU-DD-90018

CURRENT STATUS Report # 23 23/03/1999

Total Depth	(m)	: 1560	Casing Depth	(m)	: 504.15	Operator Reps	:	Wally Westman, Ian Zurakowski
Drilled last 24 hrs	(m)	: 0	Casing Diameter	(in)	: 13.375	SSDS Reps	:	Bernie Wood (17)
Hole Size	(in)	: 12.250	Casing ID	(in)	: 12.615			

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1560.00	48.80	264.20	1369.72	502.33	S83.44W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
TD	1560.00	1369.72

BHA SUMMARY

BHA 10: 316.59 m; Bit #4rr1 (19. hrs), Stab, DC, Stab, 2x DC, Sub, Sub, 24x HWDP, Jar, 6x HWDP, Sub

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
KCl/Polymer	9.2	49	11	19.0	7.0 / 22.0	6	8.5	5.20	0.50	0.00

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:30	0.50	1560.00	10	Circulate
00:30	01:00	0.50	1560.00	10	Deviation Survey, drop MSS
01:00	07:00	6.00	1560.00	10	Trip Out (at Surface)
07:00	08:00	1.00	1560.00	10	PU/LD BHA, recover MSS
08:00	00:00	16.00	1560.00	10	Wireline Logs

COMMENTS

PE605546

This is an enclosure indicator page.
The enclosure PE605546 is enclosed within the container PE908910 at this location in this document.

The enclosure PE605546 has the following characteristics:

ITEM_BARCODE	PE605546
CONTAINER_BARCODE	PE908910
NAME	Iona-4 Mud Log
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	MUD_LOG
DESCRIPTION	Iona-4 Formation Evaluation Mud Log Enclosure 1
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-4
CONTRACTOR	Western Underground Gas Storage Pty Ltd
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	12
BOTTOM_DEPTH	1560
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE605547

This is an enclosure indicator page.
The enclosure PE605547 is enclosed within the container PE908910 at this location in this document.

The enclosure PE605547 has the following characteristics:

ITEM_BARCODE	= PE605547
CONTAINER_BARCODE	= PE908910
NAME	= Iona-4 Composite Well Log
BASIN	= OTWAY
ONSHORE?	= Y
DATA_TYPE	= WELL
DATA_SUB_TYPE	= COMPOSITE_LOG
DESCRIPTION	= Iona-4 Composite Well Log Enclosure 2
REMARKS	=
DATE_WRITTEN	=
DATE_PROCESSED	=
DATE_RECEIVED	=
RECEIVED_FROM	= Western Underground Gas Storage Pty Ltd
WELL_NAME	= Iona-4
CONTRACTOR	= Western Underground Gas Storage Pty Ltd
AUTHOR	=
ORIGINATOR	= Western Underground Gas Storage Pty Ltd
TOP_DEPTH	= 600
BOTTOM_DEPTH	= 1570
ROW_CREATED_BY	= DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE605548

This is an enclosure indicator page.
The enclosure PE605548 is enclosed within the container PE908910 at this location in this document.

The enclosure PE605548 has the following characteristics:

ITEM_BARCODE	PE605548
CONTAINER_BARCODE	PE908910
NAME	Iona-4 Composite Well Log
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	COMPOSITE_LOG
DESCRIPTION	Iona-4 Composite Well Log - Reservoir Section Based on TVD/MD Conversion from Definitive Survey Enclosure 3
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	31-AUG-1999
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-4
CONTRACTOR	Western Underground Gas Storage Pty Ltd
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	1290
BOTTOM_DEPTH	1349
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE605549

This is an enclosure indicator page.
The enclosure PE605549 is enclosed within the container PE908910 at this location in this document.

The enclosure PE605549 has the following characteristics:

ITEM_BARCODE	PE605549
CONTAINER_BARCODE	PE908910
NAME	Iona-4 Paper Print Field Log
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	WELL_LOG
DESCRIPTION	Iona-4 DSI Dipole Sonic - GR Field Log Scale 1:200 Enclosure 4a
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	23-MAR-1999
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-4
CONTRACTOR	Western Underground Gas Storage Pty Ltd
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	25
BOTTOM_DEPTH	1554.4
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE605550

This is an enclosure indicator page.
The enclosure PE605550 is enclosed within the container PE908910 at this location in this document.

The enclosure PE605550 has the following characteristics:

ITEM_BARCODE	= PE605550
CONTAINER_BARCODE	= PE908910
NAME	= Iona-4 Paper Print Field Log
BASIN	= OTWAY
ONSHORE?	= Y
DATA_TYPE	= WELL
DATA_SUB_TYPE	= WELL_LOG
DESCRIPTION	= Iona-4 DSI Dipole Sonic - GR Field Log Scale 1:500 Enclosure 4b
REMARKS	=
DATE_WRITTEN	=
DATE_PROCESSED	= 23-MAR-1999
DATE_RECEIVED	=
RECEIVED_FROM	= Western Underground Gas Storage Pty Ltd
WELL_NAME	= Iona-4
CONTRACTOR	= Western Underground Gas Storage Pty Ltd
AUTHOR	=
ORIGINATOR	= Western Underground Gas Storage Pty Ltd
TOP_DEPTH	= 25
BOTTOM_DEPTH	= 1554.4
ROW_CREATED_BY	= DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)