Western Underground
Gas Storage Pty. Ltd.

TXU

WELL COMPLETION REPORT

Iona-5

PPL2
ONSHORE OTWAY BASIN, VICTORIA

VOLUME 1 OF 2
TEXT, TABLES, FIGURES, APPENDICES
& ENCLOSURES 1-3

October 1999

Copy 3 of 6

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VOLUME 1

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1.0 INTRODUCTION

Iona-5 was designed as an appraisal well of the Iona Gas-field. The location of the Iona field is shown on Figure 1.1. It was planned to first drill a side track well (named Iona-5-ST1) to evaluate a low amplitude area seen on seismic. However, the well intersected the reservoir horizon at a higher depth than prognosed, with good reservoir properties, and the well was completed as a Production well for gas withdrawal and injection from the Waarre Sandstone reservoir.

The well was drilled as a directional well to target the top Waarre Sandstone reservoir within the low amplitude area approximately 600 metres to the west of Iona-1 at the Waarre level. The surface location of the well on the Iona drilling pad was slot 7 and is shown on Figure 1.2. The well was designed to be drilled as a build and hold directional well which intersected the top of the reservoir section at an angle of just on 57.94 degrees building to 60.38 degrees at total depth.

The well was cased, completed and suspended with tubing to surface and a permanent well-head installed. The well was perforated in the basal Flaxman sand from 1582 to 1593 MDKB and the Waarre C1 sandstone reservoir from 1598 to 1602 MDKB. The well was completed as a gas producer and an initial flow and clean up test on May 9, 1999 flowed gas at an initial rate of 13.72 mmscf/day with a half inch choke which increased to 54.69 mmscf/day as the choke was stepped up to a 96/64" choke. The well was then flowed at a stabilised measured rate from 54.41 to 54.82 mmscf/day through a 96/64" choke for a period of two hours.

2.0 WELL HISTORY

2.1 LOCATION DATA

Basin:	Otway, onshore western Victoria
Lease:	PPL-2
Surface Coordinates:	5728374.1 metres North (Termed Slot 7) 677279.4 metres East
Surface Elevation:	Ground Level (GL): 130.0 metres AHD Kelly Bushing (KB): 135.0 metres AHD (Datum) (All depths relative to KB unless otherwise stated)
Bottom Hole Coordinates:	5728287.8 metres North 676563.8 metres East
Coordinate System:	Australian Map Grid 66, Zone 54, Central Meridian: 141 East

OTWAY BASIN - GAS FIELD LOCATION MAP

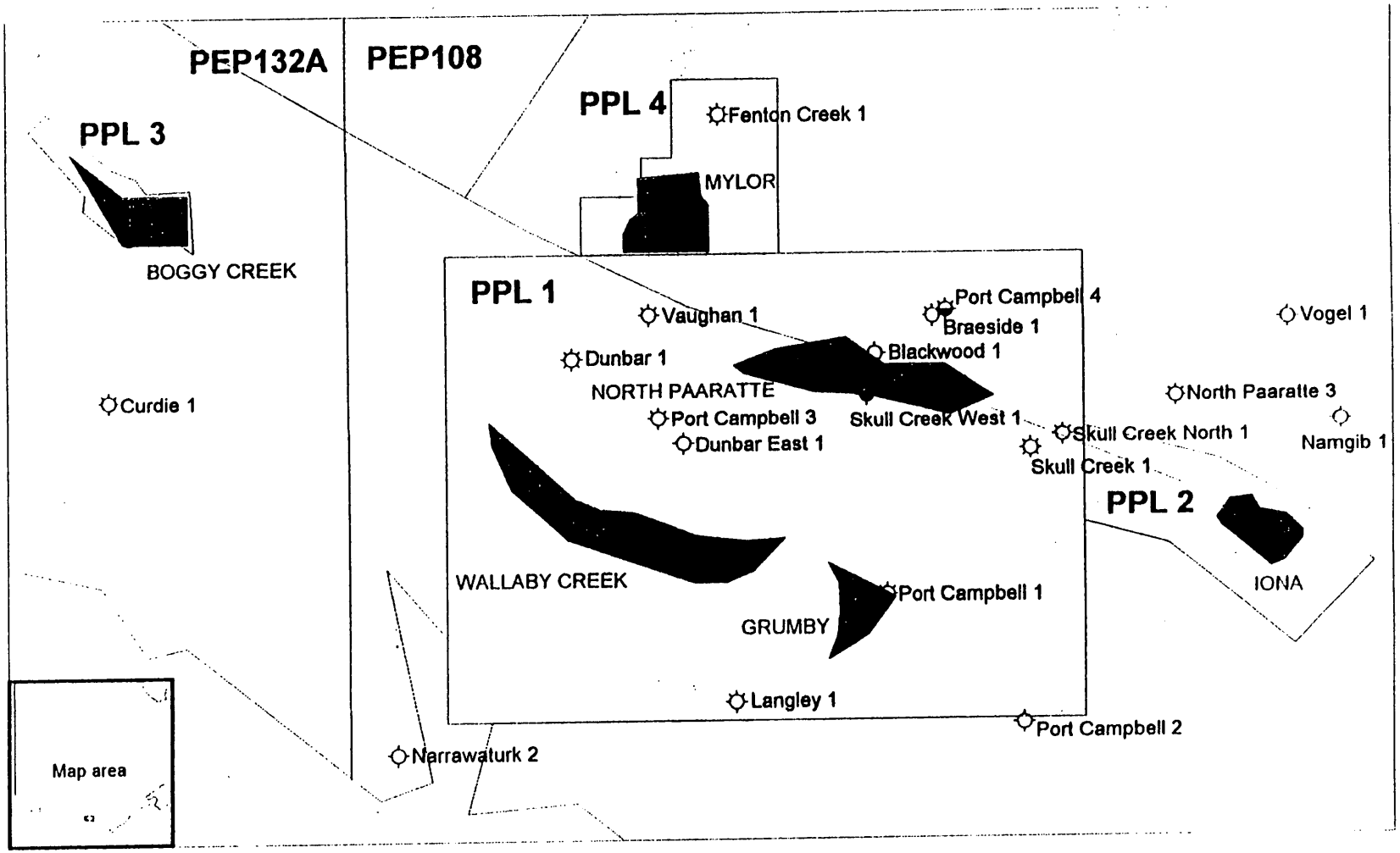


Figure 1.1

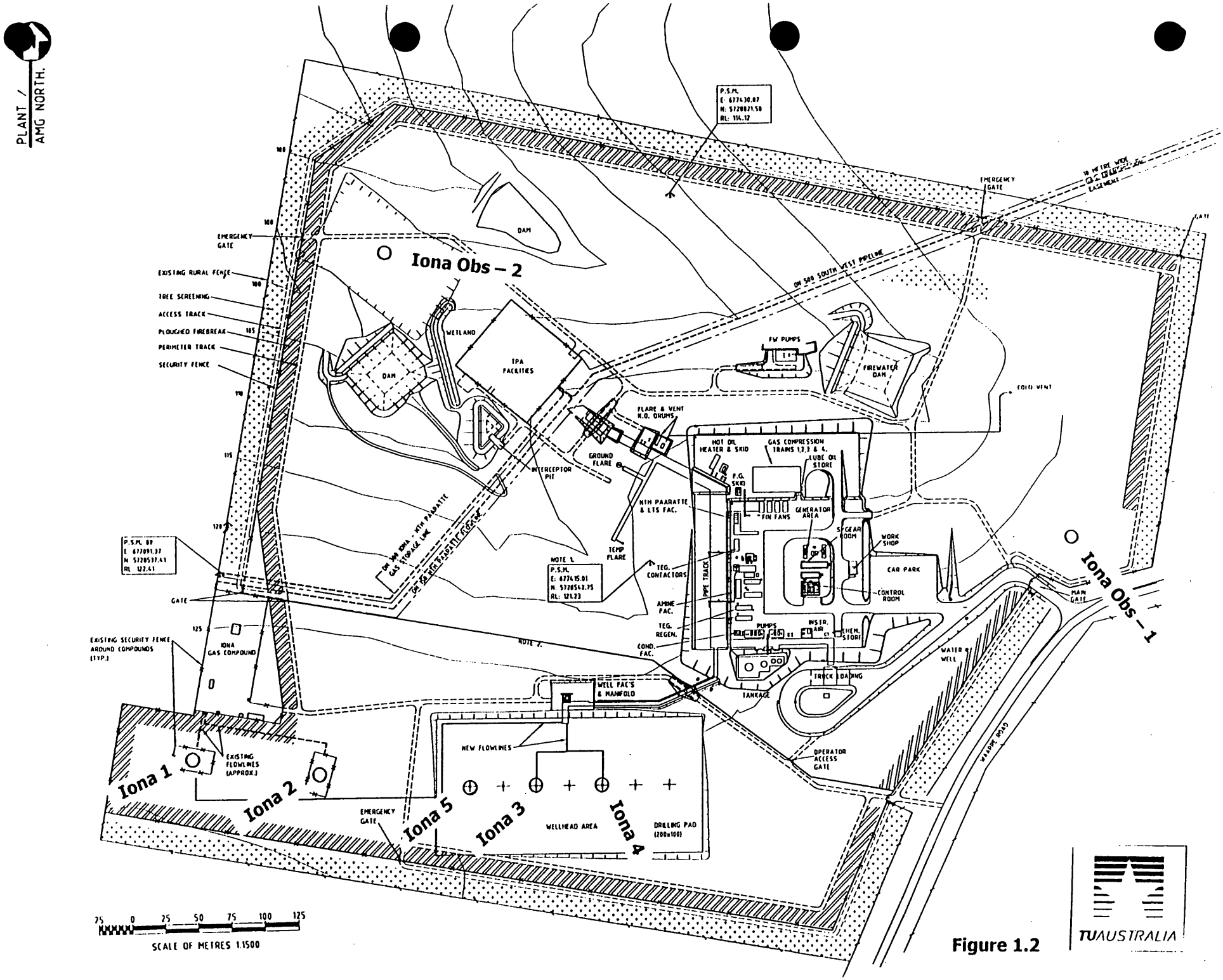


Figure 1.2

TUAUSTRALIA

9082215 011

2.2 GENERAL DATA

Well Name:	Iona - 5
Classification:	Gas Injection/Withdrawal well for the Underground Gas Storage Project
Operator:	Western Underground Gas Storage Pty Ltd ("WUGS")
Property Owner:	Western Underground Gas Storage Pty Ltd
Nearest Town:	The coastal township of Port Campbell, approximately 7 km south of the Gas Field.
Nearest Well:	Iona-3 located 25 metres to the east from the surface location.
Final measured Depth:	Driller: 1720.0 m Logger: 1722.0 m
Final True Vertical Depth:	1363.77 mKB
Spud date:	00:00 hours April 22, 1999.
TD reached:	10:40 hours April 12, 1999.
Days to Drill:	8.45 days
Date well completed:	24:00 hours May 9, 1999
Rig Released:	24:00 hrs on May 9, 1999
Well Status:	Suspended Gas Injection/Withdrawal well

2.3 WELL SUMMARY

Table 2.1 Well Summary

WELL NAME	Iona-5		
DESIGNATION	Gas Injection/Withdrawal Well		
BASIN	Otway		
OPERATIONS BASE	Kelly Down Consultants, St. Leonard's, Sydney		
FIELD OPERATIONS BASE	On site at Iona , Waarre Rd, Port Campbell, Vic.		
DRILLING CONTRACTOR	OD&E		
RIG	Rig 30		
RT to GL	4.98 m		
GL to MSL	130.0 m		
TOTAL DEPTH (M DKB)	1720.0 m KB (driller)		
RIG MOBILISED	27 Feb 1999		
SPUD DATE	00:00 hours April 22 1999.		
17.5" HOLE SECTION TD Depth/Time	656 mRT reached at 06:20 hrs April 24, 1999		
12.25" HOLE SECTION TD Depth/Time	1720 mKB reached at 10:30 hrs May 1, 1999		
SPUD TO TOTAL DEPTH TIME	8 Days 10.67 hrs		
COMPLETION INSTALLED	9 May 1999		
SPUD TO WELL SUSPENDED	14.0 Days		
CASING STRINGS	20 "	Conductor	10 m
	13.375"	Surface Casing	656 m
	9.635 "	Production Casing	1720 m
FINAL WELL STATUS	A 5 ½" x 9 5/8" single packer completion was run simultaneously with 7" TCP guns. The completion was installed without incident and a 5 ½" Wood group Xmas tree installed and tested. Perforations – 1582 m to 1593 m - 1598 m to 1602 m		

2.4 OVERALL PROJECT TIMING

The overall project schedule and timing is shown on Figure 2.1 and shows the actual performance times for the major activities over the entire project, from site construction activity, through drilling and workover to completion, clean up and well hand-over.

Insert figure 2.1 here

FIGURE 2.1 – IONA PROJECT SCHEDULE

2.5 CONTRACTORS

Table 2.2 Contractors

PROJECT MANAGERS	Kelly Down Consultants Pty Ltd
DRILLING	OD&E
LOCATION SURVEY	T. G Freeman and Associates
SITE CONSTRUCTION	Walter Mellis
WATER SUPPLY	Trucked in by Walter Mellis
FUEL SUPPLY	Supplied by Drilling Contractor
SUPPLY BASE	Max Nelson Storage yard – Cobden
CEMENTING	Halliburton
MUD SYSTEM - Drilling Fluids - Solids Control	 Baroid Via Drilling Contractor
MUD LOGGING	Halliburton
ELECTRIC LOGGING	Schlumberger
DRILLING TOOLS	Tasman Oil Tools
DIRECTIONAL DRILLING	Sperry/Halliburton
GYRO SERVICES	Gyrodata via Halliburton
MWD	Halliburton
CASING SERVICES	Premium Casing
CORING	Corepro
CASING & TUBING	Marubeni/Sumitomo
WELLHEADS - Drilling Spools - Xmas Trees - Miscellaneous Flanges/Xovers	 - Wood Group/Gearhart - Wood Group/Keamey Engineering - Gearhart & Baker Oil Tools
COMPLETION SERVICES - Slickline - Completion components - TCP perforating - Lubricator	 - Halliburton - Halliburton - Schumberger - Expertest
WELL TESTING	Halliburton
ENVIRONMENTAL - Waste Disposal	 Timboon Plumbing
FUEL SUPPLY	
RIG CAMP	Camp Cooriemungle
TRUCKING	Max Nelson Transport
CRANE SERVICES	Timboon Engineering
COMMUNICATIONS - Landlines - E Mail/Internet	 - Telstra - Big Pond

3.0 DRILLING DATA

3.1 WELL STATUS

The following figures illustrate the suspended condition of the wellhead, completion, and other pertinent data at the time of well hand-over from drilling to production. Figure 3.1 is the Wellhead Diagram, Figure 3.2 is the Completion Diagram and Figure 3.3 is the Hand-over Certificate.

3.2 OPERATIONAL SUMMARY

3.2.1 Logistics and Planning

Kelly Down Consultants ("KDC") managed the drilling and completion of the Iona-5 well on behalf of WUGS as part of the project to drill and complete three injection/withdrawal wells, two observation wells, and the re-completion of the two existing wells.

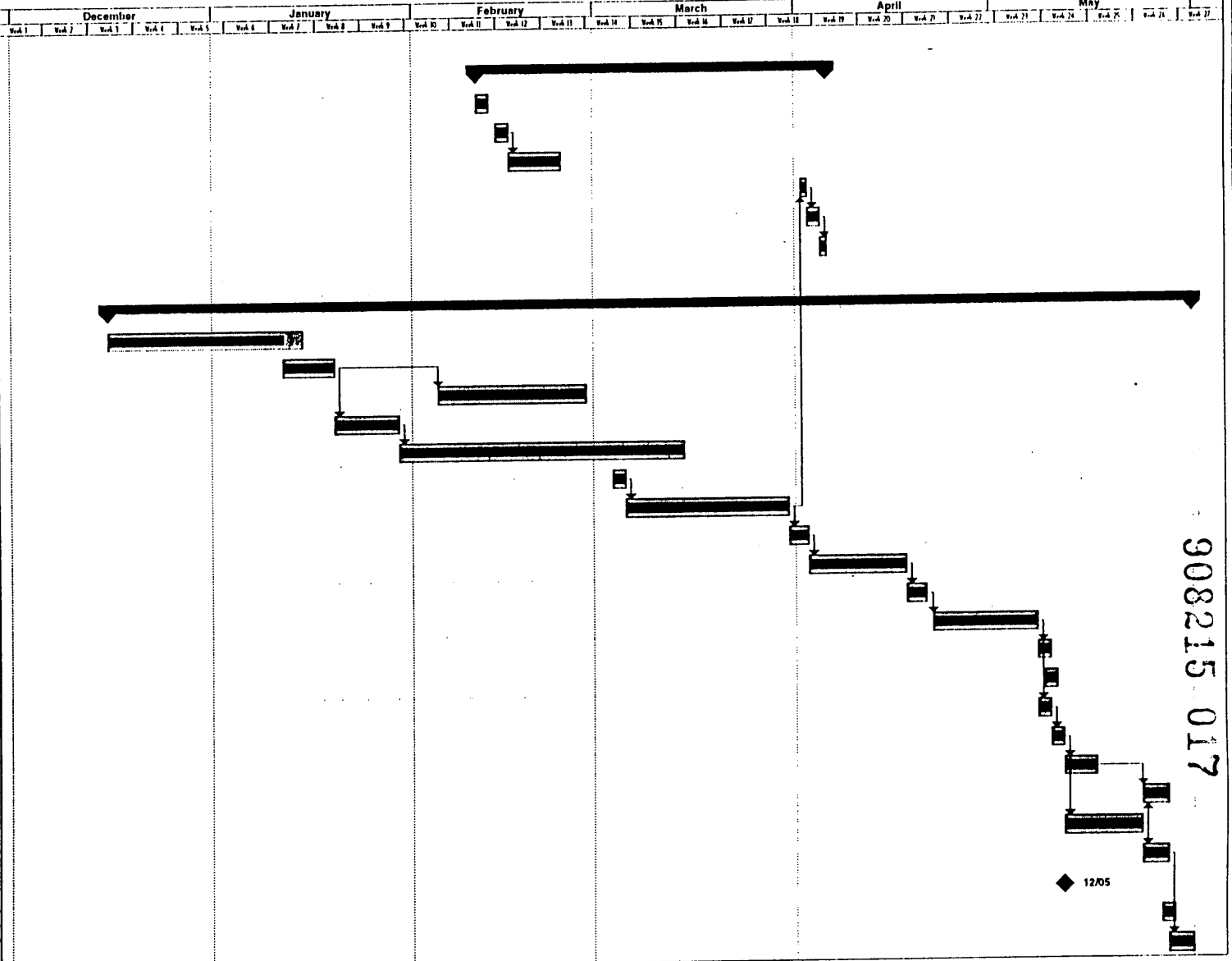
Materials and logistics were managed out of the KDC Sydney offices with the input of the rig site team. Periodic visits to the well site by the materials and logistics coordinator ensured that inventory and service records were managed properly.

Mud and cement chemicals were supplied by Halliburton, from their Cheltenham facility. Directional drilling surveying and MWD equipment was provided by Halliburton from a number of locations mainly Perth and Darwin. The large distances and subsequent mobilisation times meant that it was often more economic to leave equipment on stand by in between jobs (such as casing running equipment) rather than truck equipment back and forth to the site.

The first site visit to assess lease building requirements took place on 21 December 1998. The Iona gas field site is set in a rural part of South West Victoria, approximately seven kilometers north of the township of Port Campbell. Two existing wells, Iona 1 and Iona 2, had commenced production at the site in 1992 and 1994 respectively. The new facilities for gas production/injection and processing were to be built on a large site encompassing the existing wells. The overall site area for the WUGS gas plant is approximately 0.5 km x 0.6 km square. All the new wells and the two existing wells have their surface locations within the security fence at the perimeter of the site.

WESTERN UNDERGROUND STORAGE - DEVELOPMENT DRILLING PROJECT. PHASE 1

ID	Task Name	Duration
1		
2	EXISTING WELLS (Provisional programme -IBA)	54d
3	CONDUCT GYRO SURVEY IONA 2	2d
4	MOBILISE WORKOVER RIG to IONA 1	2d
5	WORKOVER IONA 1 (Change Tubing)	8d
6	REPERFORATE IONA 2	1d
7	CONDUCT WELL TEST ON IONA 2	2d
8	CONDUCT WELL TEST ON IONA 1	1d
9		
10	NEW WELLS	167d
11	WELL PLANNING & LOCATION APPROVALS	30d
12	CONSTRUCT OBS-1 WELL SITE	8d
13	DRILL OBSERVATION 1 WELL & COMPLETE	23d
14	CONSTRUCT OBS-2 WELL SITE	10d
15	CONSTRUCT I/W DRILLING PAD	44d
16	MOVE RIG TO I/W DRILLING PAD & PREPARE TO SPUD	2d
17	DRILL I/W WELL IONA 4 (SLOT 3) COMPLETE & CLEAN UP	25d
18	REPOSITION RIG OVER IONA 3 (SLOT 5)	3d
19	DRILL I/W WELL IONA 3 (SLOT 5) COMPLETE & TEST	15d
20	RESPOSITION RIG OVER IONA 5 (SLOT 7)	3d
21	DRILL & COMPLETE I/W WELL IONA 5 & IONA-5 (ST1)	16d
22	TEST IONA 5 W. ESSO XMAS TREE . SUSPEND WELL W. XXN AND BPV	2d
23	INSTALL XMAS TREE ON IONA 4 . COMMISSION & HANDOVER	2d
24	CONSTRUCT NEW ACCESS ROAD TO OBS 2 (VIA WESTERN TRACK)	2d
25	MOVE RIG TO OBS-2 WELL SITE	2d
26	PREPARE & STORE SURPLUS PIPE STOCK ON I/W PAD	5d
27	PREP & STORE SURP. COPMPLETION STOCK IN DRILLING CONTAINER	4d
28	DRILL OBS-2 WELL & COMPLETE, & HANDOVER TO OPERATIONS	12d
29	DEMOBILISE RIG 30 FROM OBS 2 SITE	4d
30	HANDOVER IONA 3 TO OPERATIONS	1d
31	INSTALL XMAS TREE ON IONA 5 . COMMISSION & HANDOVER	2d
32	CONDUCT SITE CLEAN UP OPERATIONS	4d



Project: Western Underground Storage
Date: Wed 4/08/99

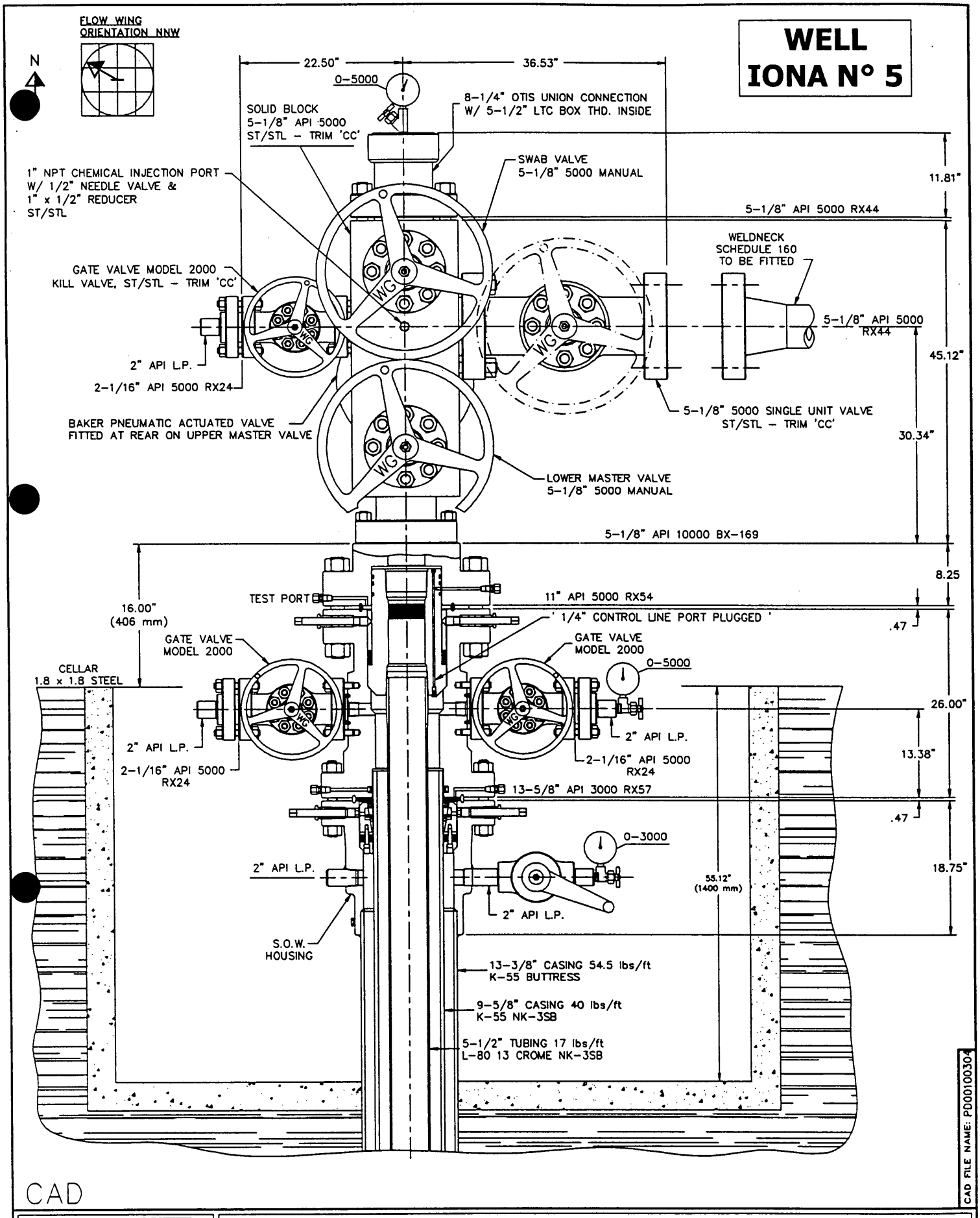
Task | Milestone | Rolled Up Task | Rolled Up Progress
Progress | Summary | Rolled Up Milestone

Project Status

wugs_schedule280599 Page 1

KDC For WUGS

Figure 2.1



CAD

WOOD GROUP

Wood Group Pressure Control
Mob: 0409-941693
Fax: (03) 9589-6127
Email: crosslandrwgpc@ozemail.com.au

WESTERN UNDERGROUND
IONA GAS INJECTION WELL N° 5
CASING PROGRAM: 13-3/8" x 9-5/8" x 5-1/2"

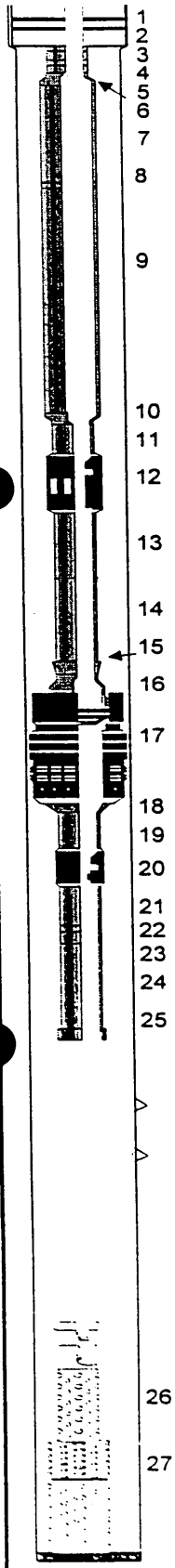
Drawn by:	Date:	Scale:	Drawing Number SHT 1 OF 1
R.C.	02-06-1999	N.T.S.	PD-001003-04

Figure 3.1

HALLIBURTON

Australian Completions

WELL : Western Underground Gas Storage; Iona 5
DATE : 08-May-99



Depth	Length(m)	No.	DESCRIPTION	O.D.	I.D.	PART / No
0.00	4.600		Elevation MDRKB			
4.60	0.240	1	Woodgroup Tubing Hanger -	5.500	4.950	
	0.300		Compression (15,000.lb.)			
4.84	1.720	2	Pup Joint 13 Cr 80 - 5 1/2" 17 ppf NK3-SB	5.500	4.892	
6.56	0.540	3	Pup Joint 13 Cr 80 - 5 1/2" 17 ppf NK3-SB	5.500	4.892	
7.10	5.260	4	Pup Joint 13 Cr 80 - 5 1/2" 17 ppf NK3-SB	5.500	4.892	
12.36	0.920	5	Pup Joint 13 Cr 80 - 5 1/2" 17 ppf NK3-SB (BxB)	5.500	4.892	
13.28	0.430	6	CrossOver, L80 - 5 1/2" NK3SB P x 7" New Vam B	7.681	4.892	MSO 8032
13.71	275.690	7	Tubing - 7" 29 ppf New Vam L-80	7.000	6.184	Marubeni
289.40	0.920	8	CrossOver, L80 - 7" New Vam P x 7" NK3SB P			Marubeni
290.32	1245.620	9	Tubing - 7" NK3SB 29 ppf L & N 80	7.000	6.184	Marubeni
1535.94	0.340	10	CrossOver, L80 - 7" NK3SB P x 5 1/2" NK3SB Box	7.000	4.892	MSO 8032
1536.28	3.010	11	Pup Joint 13 Cr 80 - 5 1/2" 17 ppf NK3-SB (PxP)	5.500	4.892	
1539.29	1.420	12	SSD - 5 1/2" NK3-SB B x P 9 Cr	6.600	4.562	621 XD 45603
			[Open Down - Flow Area 16.35 sq in]			
			[Positioning Tool - 42 BO 153]			
1540.71	2.200	13	Pup Joint 13 Cr 80 - 5 1/2" 17 ppf NK3-SB	5.500	4.892	
1542.91	2.200	14	Pup Joint 13 Cr 80 - 5 1/2" 17 ppf NK3-SB	5.500	4.892	
1545.11	0.340	15	Crossover - 5 1/2" NK3-SB B x 4 1/2" EUE P 9 Cr	6.014	3.872	MSO 7867
1545.45	0.410	16	Ratch Latch w/ RTR Seals - 4 1/2" EUE B 9 Cr	5.630	3.938	212 OO 7326
1545.86	2.460	17	Packer - 9 5/8" HVT 40 # LTC B 9 Cr	8.520	3.880	812HVT95382
1548.32	0.260	18	Crossover - 5" LTC P x 4 1/2" LTC Pin 9 Cr	5.000	3.872	MSO 7867
1548.58	3.070	19	10' Pup Jt - 4 1/2" 11.6 ppf K55 w/LTC BxP	4.500	3.990	
1551.65	0.400	20	'XN' Nipple, 3.813 - 4 1/2" LTC B x P 9 Cr	5.023	3.725	11XN 38160-A
1552.05	3.050	21	10' Pup Joint - 4 1/2" K55 w/LTC Box x Pin	4.500	3.990	
1555.10	0.280	22	CrossOver - 4 1/2" LTC Box by 4 1/2"EUE Pin	5.000	3.958	
1555.38	0.240	23	Debris Sub - w/ 4/12" EUE Box x Pin	5.560	3.880	
1555.62	9.630	24	Tubing Joint - 4 1/2"12.75 lb. w/EUE Box x Pin	4.500	3.958	
1565.25	0.650	25	Schlumberger SAXR w/41/2 EUE Box.	5.560	3.860	
1565.90			End of Tubing(after gun release)			
		26	3 3/8" OD Gun Spacer	3.375		
		27	7" Gun Loaded	7.000		
			Perforations at 1582.m to 1593.m and 1598.m to 1602.m			
			7" TCP 30 deg phasing 12 spf 37 gm HMX charges			
			After Guns fired & released			
			Top of fish at 1671.9 meters			
			Schlumberger TCP Assembly - left in hole;			
			consisting of 7" guns and 3 3/8 gun spacer.	3.375		
			Total TCP length left in hole: 36.1 meters	7.000		
			PBTD at 1708.. meters			
			Pick-up weight : 125,000 .lb.; Slack-off: 102,000 .lb			
			15,000. lb compression on tubing			
			Ratch Latch pinned at 120,000. lb.			
			Completion Fluid: 8.6 lb/gal inhibited 3% KCl brine.			

Figure 3.2

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WELL HANDOVER & STATUS RECORD

TU AUSTRALIA

WESTERN UNDERGROUND GAS STORAGE

Detail	Description	Distribution	
		Name	Company
Field / Country:	Iona / Australia	Garv Scott	WUGS
Well No:	Iona 5	Kurt Matheson	TU Australia
Well Surface Co-ordinates:	5728374.14 N: 677279.42.42 E	David Hesse	Worley/Bechtel
Well TD Co-ordinates:	5728287.81 N 676563.78 E	Colin Stuart	KDC
Maximum Inclination:	48.8 deg @ 1362 m MDRKB	Jim Slater	KDC
Well Drilled by :	OD&E Rig 30 - Drilling Management KDC ltd		
Rig Floor Elevations:	KB to GL: 4.98 m GL to MSL: 130 m		
Well TD/PBTD	TD: 1720 m MDRKB PBTD: 1708 m MDRKB		
Well Type:	Single Completion Gas Well		
Purpose of handover	Handing new well to Production Operations		
Handover from:	WUGS Drilling -		
Handover to:	Wugs Operations -		
HANDOVER DATE:	June 08 1999		

WELL STATUS (All depths MDRKB unless stated otherwise)

Item	Description	Status at handover	Pressure Status	Size/type/rating	Comments / Remarks
	Xmas Tree	Installed	Bled to Zero above BPV	5 1/2" 5.000 psi	Wood Group Block Tree
1	Swab Valve	Closed	0 psi above/below	5 1/8" API 5.000 psi	
2	Tree upper master valve	Open	0 psi	5 1/8" API 5.000 psi	
3	Upper master actuator	Lock out cap installed	Pneumatic, no air supply	100 psi air supply	Baker Oil Tools type 1705
4	Tree lower master valve	Closed	0 psi above/below	5 1/8" API 5.000 psi	
5	Flow wing valve	Closed	0 psi above/below	5 1/8" API 5.000 psi	
6	Kill Wing Valve	Closed	0 psi above/below	2 1/16" API 5.000 psi	
7	Tree BPV	Installed	1500 psi below BPV	5" nominal Type H	
8	Tree cap	Installed			6.000 psi gauge installed
9	A annulus valve	Closed			3.000 psi gauge installed
10	A annulus valve outer	Not installed			
11	B annulus valve	Closed			
12	Last rec.flow / FTHP	54.77 MMSCFD @ 1388 PSIG 09/05	SITHP = 1500 psig		Est. rate during brine clean up
13	Well fluid	Gas to BPV	1500 psi below BPV		SI pressure below BPV 1500 psi
14	A Annulus	8.6 ppg 3% KCL inhibited brine	0 psi	2 x 208 Litre drums inhibitor	COAT 2748 Baroid inhibiter
15	Wireline plugs installed?	No			
16	Perforated Interval	Open		1582 to 1593 & 1598 to 1602 m	7 " TCP 30 deg,12 spf, 37gm.hmx
17	Production Tubing	7" 29 ppf New Vam L80		ID: 6.184" Drift: 6.059"	Tubing x/o to 5 1/2" see diagram.
18	Nipple Profile	XN @ 1551.65 m		ID: 3.725"	Part No. 11XN38160-A
19	Sliding Sleeve	5 1/2" SSD @ 1539 m		ID: 4.562"	Part No. 621 XD 45603
20	Production Packer	9 5/8" HVT 40# @ 1545 m		ID: 3.880"	Part No. 812HVT 95382
21	Production Casing	9 5/8" 40 ppf L80 NK3SB		ID: 8.835" Drift: 8.679"	
22	Minimum restriction	X/Over 5" x 4 1/2" @ 1548 m		ID: 3.830"	Packer to tailpipe X/O
23	Wellhead Type	13 3/8" x 9 5/8" x 5 1/2"	5.000 psi rated		Wood Group Slip & Seal Type

Remarks:

Well handed to WUGS Operations following completion of drilling and testing program.
Tree cap installed on Xmas tree.
Steel Cellar installed, with ground level grating.
Handwheel locked with looped chain, (Lower Master)
Temporary protective steel cage to be installed around well.
Warning sign posted on actuator lockout cap.
Name Plate installed on cage.
Cellar drain installed.
A 5 1/8" 5.000 psi to 6" SCH 160 Weld Neck flange, for flow wing valve outlet connection to flow line, has been left inside the stores (blue) container.

Signatures:

Well accepted by : Signed: Date: 25/6/99

Well handed over by : Signed: Date: 4/06/99

Figure 3.3

3.2.2 Site Preparation

Iona-5 surface location was situated on the main production/injection pad, and was selected as a bottom hole target during the drilling of Iona 3. The BHL was due West of the main pad, which meant that slot 7 was the natural choice to drill from. A cellar was prepared during the drilling of Iona 3.

Iona-5 was a late addition to the development drilling programme and was designed initially to have a pilot hole drilled to a bottom hole location on the western flank of the structure. The pilot hole was then to be abandoned and a sidetrack drilled to a South Western target for completion as a Producer/ Injector. In the event, the reservoir interval encountered at the pilot hole location was of sufficiently high quality to warrant completion.

Of particular concern throughout construction was adherence to the environmental management plan for the project, which stressed the minimisation of noise and dust levels. This necessitated the spraying of water, which had to be trucked into site from nearby water sources, as dam water on the WUGS site itself was reserved for gas plant construction requirements. A turkeys nest or small dam was eventually built to store trucked water for mud mixing. A water well was planned to be drilled on site by the gas plant construction group but this was delayed and as a result, water was trucked into the drilling site.

A schematic of the overall site showing the location of Iona-5 within the site boundary is shown on Figure 1.2.

3.2.3 Mobilisation

The well was drilled in continuation from Iona 3. The rig was moved from slot 5 , on April 20, 1999. As in all the other rig moves, Rig 30 had not been modified to facilitate moving on rails, so trucks were brought in and a crane used to lay down the derrick, mud tanks, sub base and rig floor.

3.2.4 Pre Spud

The Iona-5 pre-spud was held at the rig site on April 21, 1999. The rig move from slot 5 (Iona 3) location commenced at 1700 hrs April 20, 1999 and was completed by 00:00 hrs on April 22, 1999.

3.2.5 17 ½" Hole Section

After a full safety briefing with the rig crews, Iona-5 was spudded at 00:00 hrs on April 22, 1999. The 17 ½" hole was drilled using a KCL/PHPA/Polymer fresh water mud system. The PHPL was used to inhibit the reactive clays present within the Tertiary and Late Cretaceous claystones, ie. in the Gellibrand marl, Pember mudstone and Paaratte Formation. This mud system had been carried over from previous wells and proved relatively cheap low maintenance mud. Due to the location of Iona-5 on

the west boundary of the main pad, a mud returns ditch was dug from the outfall of the shakers to get cuttings back to the mud pit constructed for Iona 3. This saved the construction of a separate mud pit, and required occasional work with a back hoe to keep the ditch clear.

A vertical hole was drilled as per the well plan to the 17 1/2" hole section TD at 656 m. Drilling was without incident. BHA included 3 stabilisers, which were run to assist in "straightening" the hole, and prevent a repeat of the stuck casing on Iona-4. A wiper trip prior to POOH showed the hole to be in good condition. The 13 3/8" casing was run and cemented in place trouble free. The casing was cut and the wellhead welded in place and pressure tested to 2000 psi prior to drilling out.

3.2.6 12 1/4" Hole section

An FIT was performed 3m outside the shoe resulting in a leak off of 10.9 ppg. The kick off assembly was run from the shoe with a tri-cone bit. After drilling to 637 m the string was pulled to replace a failed MWD tool. Drilling continued to 1287 m where bit was pulled, as the hole angle was dropping to an extent that the target could have been missed. A PDC bit was run and the remainder of the section drilled in rotary mode to TD. Open hole logs were run at TD.

3.2.7 9 5/8 " Production String

A combination 9 5/8" string was run with 100 m of 40 lb/ft 13 CR L80 NK3SB casing across the pay zone and L80 casing back to surface. The string was cemented successfully in place and the wiper plug bumped with 2500 psi. A conventional slip and seal type wellhead was installed after dropping the casing slips, and cutting the 9 5/8" casing. The tubing head was installed and tested to 2000 psi.

A CBL log showed effective isolation across the reservoir sands had been achieved.

3.2.8 Clean up and Perforate

A 9 5/8 " casing scraper run ensured a clean setting position for the completion packer while circulating the well to brine prior to running the completion. A 3% KCL brine was circulated at TD preceded by a clean up sweep.

3.2.9 Completion

Iona-5 was completed with 7" tubing to increase delivery and future injection capacity. However due to insufficient time, the backup 5 1/2" completion components were run with crossovers on the 7" tubing. Pressure loss calculations showed the pressure loss at the crossover points were not significant. This included losses across the Xmas tree which was also 5 1/2". A 5 ½" x 9 5/8" single packer completion was run simultaneously with 7" TCP guns. The completion was installed without incident and a 5 ½" Wood group Xmas tree installed and tested. After rigging up surface test lines, the TCP guns were detonated by drop bar method, and the well flowed to clean up.

Test rate details can be found in the Halliburton Iona well test report, see Appendix 5.

3.3 DAILY OPERATIONS

3.3.1 Daily Drilling Reports

The details of the daily activities during rig up and drilling operations for the Iona-5 well are presented in the Daily Drilling reports in Appendix 1.

3.3.2 Time Depth curve

The daily cost estimates can be found in graphical format in the time depth curve in Figure 3.4.

3.3.3 Definitive Survey

A gyro was survey was run in drill pipe on the casing scraper run. Details of the survey are found in Appendix 2 and Appendix 6.

3.3.4 Directional Drilling

No significant problems were experienced on the well directionally. It was planned to drill the tangent section in rotary mode with the PDC to try and eliminate excessive sliding which was to some extent experienced on the earlier Iona wells. The PDC was introduced later in the section than planned but it successfully finished the section in rotary mode. This demonstrated that the technique worked and had value. Time was saved in reduced sliding time, and the hole was easier to trip, log and case, due to less "ledging" during the sliding sections. The detailed directional report can be found in Appendix 6. A directional plot showing a plan and section view is presented in Figure 3.5a & b.

3.3.5 Iona-5 Time Performance

Iona-5 was spudded at 00:00 hrs on April 22, 1999, with OD&E Rig 30. The rig was released at 24:00 hrs on May 9, 1999, after drilling, completion and testing in 18 days.

Table 3.1 and Figures 3.4, 3.5 and 3.6 illustrate the time performance.

3.3.6 Time Analysis

Table 3.1 Time Summary

ACTIVITY	HOURS	DAYS
Rig move	24	1.00
Rig up	24	1.00
Drilling	106	4.42
Bit Trip	34	1.42
Wiper trip	58.5	2.44
Survey	3.5	0.15
Circulate and condition	30	1.25
Change BHA	5	0.21
Casing & Cementing	31.5	1.31
Wellhead & BOP's	46	1.92
Coring	0	0.00
Logging	59.5	2.48
Wash & Ream	5.5	0.23
Fishing	0	0.00
Rig Repairs	6.5	0.27
Completion	45.5	1.90
Miscellaneous	0.5	0.02
TOTAL	**480**	**20.0**

WUGS - WESTERN UNDERGROUND GAS STORAGE

9/06/1999

Well: IONA-5 (TBC) **Rig: OD&E 30** **Actual elevations: GL to SS 130.0 m GL to KB 4.98 m** **Permit: PPL-2 Otway Basin**

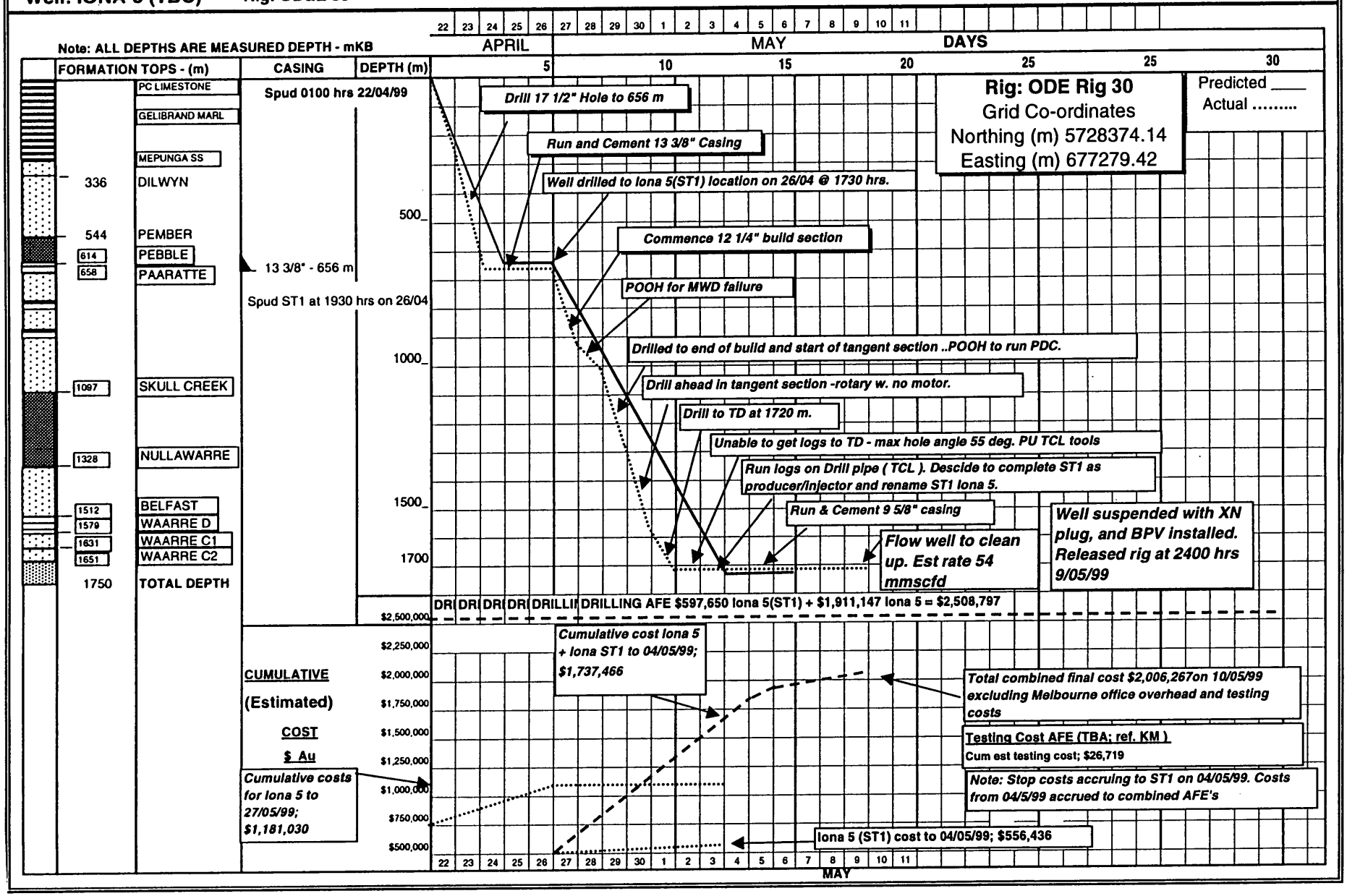


Figure 3.4

sperry-sun DRILLING SERVICES A HALLIBURTON COMPANY | Western Underground Gas Storage Pty. Ltd. | DrillQuest

Well : Iona #5 ST1

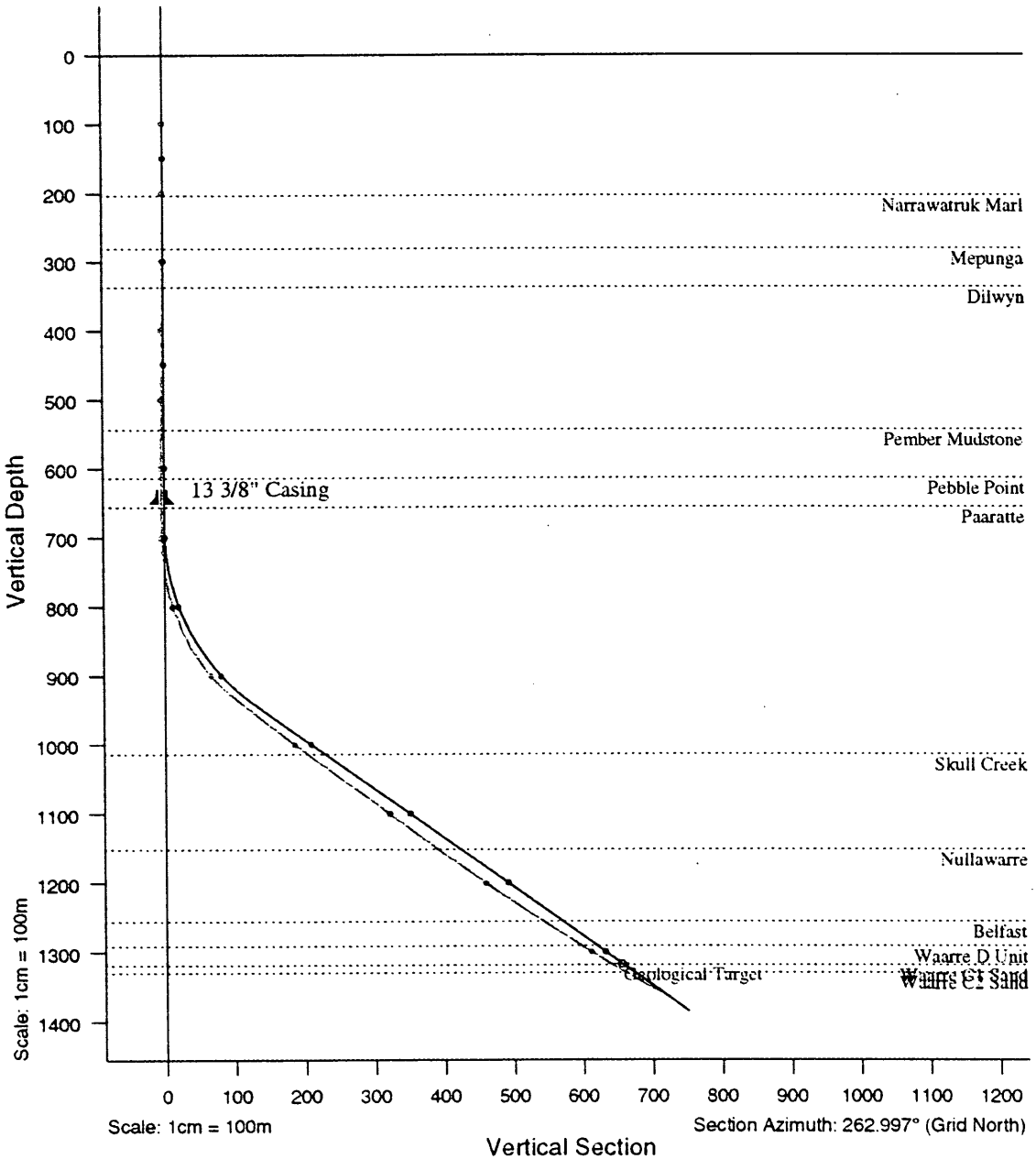


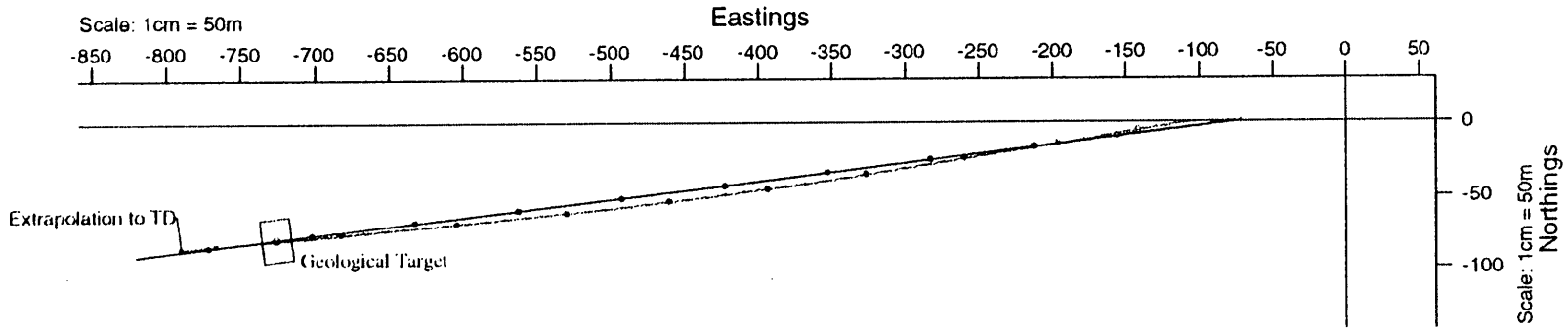
Figure 3.5a

sperry-sun DRILLING SERVICES

Western Underground Gas Storage Pty. Ltd.

DrillQuest

Well : Iona #5 ST1



Current Well Properties	
Well :	Iona #5
Horizontal Coordinates:	
Ref. Global Coordinates :	5728374.14 N, 677279.42 E
Ref. Drillpad Slot #4 :	0.00 N, 75.00 W
Ref. Geographical Coordinates :	38° 34' 31.0317" S, 143° 02' 06.3135" E
RKB Elevation :	134.98m above AHD
Grid North Convergence :	-1.270°
North Reference :	Grid North
Units :	Metres

Figure 3.5b

Figure 3.6 Time Performance Charts

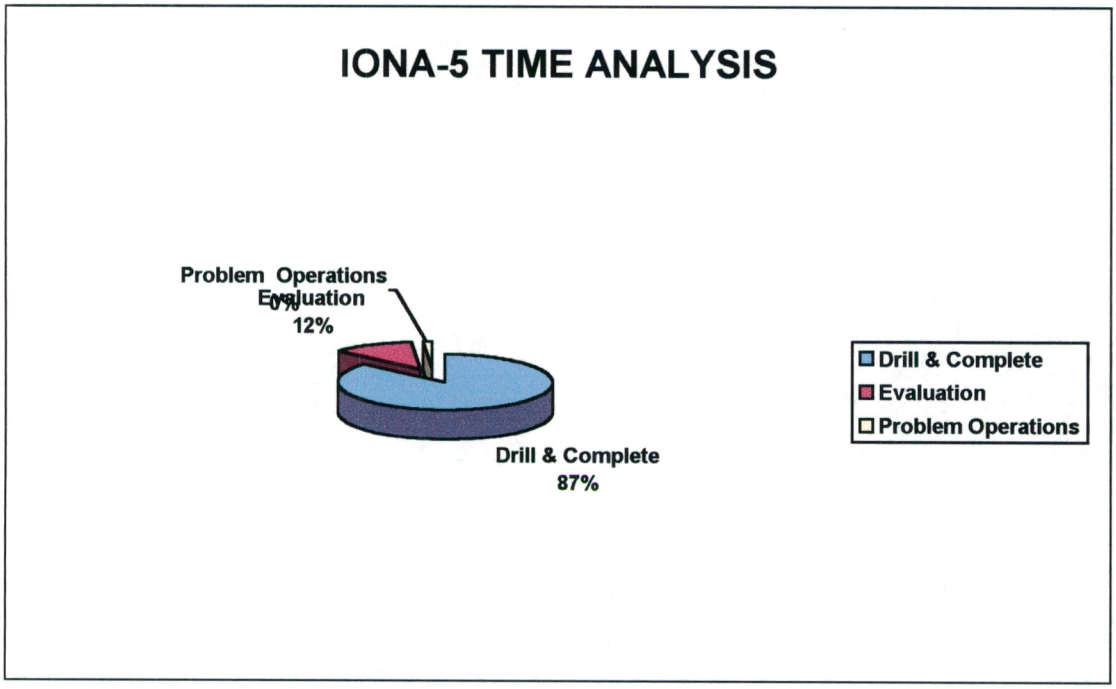


FIGURE 3.6a - OVERALL PERFORMANCE CHART

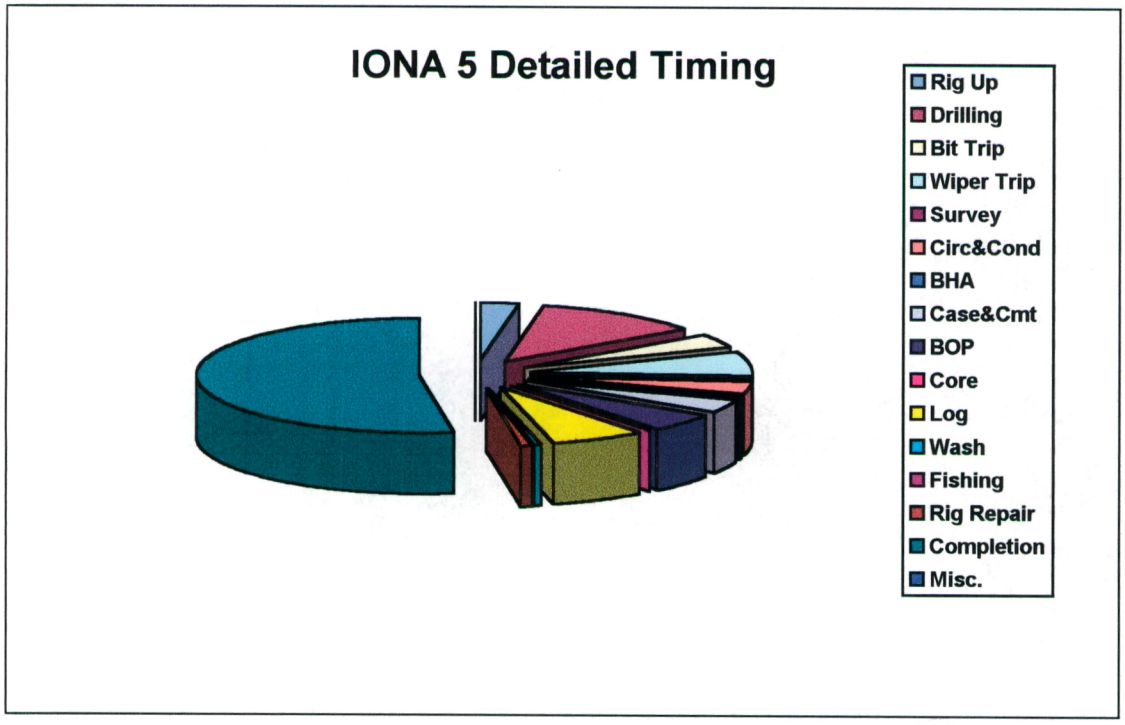


FIGURE 3.6b - DETAILED PERFORMANCE CHART

3.4 BHA AND BIT SUMMARIES

The BHA's and bit record are detailed in the Directional Drilling report in Appendix 6.

3.6 CASING AND CEMENTING REPORT

3.6.1 17 1/2" Hole Section : 13 3/8" Surface Casing (Surface to 635 m RT)

Table 3.2 13 3/8" Surface Casing Tally

SURFACE CASING

WELL NAME :	Iona-5		**DATE RUN :**		24/04/99
ELEVATIONS :	**R.T. :**	4.98 m	**M.S.L. :**	130.5 m	**T.D. :** 656 m
STRING TYPE :	13 3/8" Surface k55		**RKB TO TOP OF LAST SPOOL :**		

SURFACE CASING & EQUIPMENT RECORD AS RUN FROM TOP TO BOTTOM

Size O.D. (ins)	Weight (lb/ft)	No. of Joints	Thread Type	Length (m)	From (m)	To (m)	Remarks
13 3/8"	61	shoe	BTC	0.56	656	655.45	Shoe &float/Joints
13 3/8"	61	2	BTC	23.49	655.45	531.96	
13 3/8"	61	Float C	BTC	0.37	631.96	531.59	
13 3/8"	61	31	BTC	364.97	631.59	266.62	
13 3/8"	54.5	22	BTC	258.45	266.62	1.83	
			Tally Total :	657.83.0	Casing Landed at : 5.32		m

CASING SPOOL TYPE :	WG	**SIZE :**	13 3/8" x 9 7/8" x 5 1/2"		
CENTRALISERS AT :	2 on shoe joint, 1 per second joint thereafter				
SCRATCHERS AT :	Cement basket at 120 m				

Table 3.3 Surface Casing Cement Details

SURFACE CASING CEMENT DETAILS

DRILLING FLUID PRIOR TO CEMENTING :	9.1ppg Weighted KCL / PHPL
PREFLUSH, SPACER DETAILS :	30 bbl, 8.3 ppg Drill Water ahead of cement.

CLASS	No. SX	ADDITIVE	FUNCTION	QUANTITY OF ADDITIVE (lbs / gal)	%	HOW ADDED BLEND OR MIX WATER	REMARKS
'G'	1224	Bentonite CFR-3L NF-1	Gel Extender Friction Reducer Anti-Foam	2838 lb 88 gal 2 gals	2.5 2gals/10 bbl 1	Blend Mix Water Mix Water	Lead Slurry,
'G'	453					Mix Water	Tail Slurry –no losses

Table 3.3 Surface Casing Cement Details

THEORETICAL TOP OF CEMENT (m) :	Surface	**AVERAGE SLURRY WEIGHT (ppg) :**	Lead 12.8 Tail 15.8
DISPLACEMENT FLUID :	8.3 ppg Fresh water	**DISPLACEMENT RATE (bbl/min) :**	16 (Rig pumps)
PLUG BUMPED WITH (psi) :	Bumped – 2500	**DISPLACEMENT VOLUME (bbl) :**	Calculated 331 Actual 331
REMARKS :	Good returns, floats held.		

3.6.2 12 1/4" Hole Section: 9 5/8" Production Casing (0 to 1459 m RT)

Table 3.4 9 5/8" Production Casing Tally

PRODUCTION/MONITORING CASING

WELL NAME :	Iona-5		**DATE RUN :**		25/04/99
ELEVATIONS :	**R.T. :** 4.98 m		**M.S.L. :** 130.5 m	**T.D. :**	1560 m
STRING TYPE :	9 5/8" Production		**RKB TO TOP OF LAST SPOOL :**		4.90m

SURFACE CASING & EQUIPMENT RECORD AS RUN FROM TOP TO BOTTOM

Size O.D. (ins)	Weight (lb/ft)	No. of Joints	Thread Type	Length (m)	From (m)	To (m)	Remarks
9 5/8"	47 L80	1	NK3SB	0.6	1719.4	1720.0	Shoe&float joints
9 5/8"	47 L80	1	NK3SB	11.17	1708.23	1719.40	
9 5/8"	47 L80	1	NK3SB	0.61	1707.62	1708.23	
9 5/8"	47 L80	13	NK3SB	151.36	1556.26	1707.62	
9 5/8"	47 L80	1 x X/O	NK to Butt	2.78	1553.48	1556.25	
9 5/8"	47 L80	10	BTC	116.74	1436.74	1553.48	
9 5/8"	47 L80	1 x X/O	Butt to NK	11.53	1425.21	1436.74	
9 5/8"	47 L80	124	NK3SB	1428.01	-2.8	1425.21	2.8 Stick Up
Tally Total :				1722.80	Casing Landed at :		1720

CASING SPOOL TYPE :	WG	**SIZE :**	13 3/8" x 9 5/8" x 5 1/2"		
CENTRALISERS AT :	One per joint for first 10 joints, every 2 joints to shoe.				
SCRATCHERS AT :	Nil.				

3.6.3 9 5/8" Production Casing Cement Details

Table 3.5 Production Casing Cement Details

DRILLING FLUID PRIOR TO CEMENTING :	9.2 ppg Weighted KCL / PHPL
PREFLUSH, SPACER DETAILS :	20 bbls water plus 20 bbl, 8.5 ppg Mudflush.

CLASS	No. SXS	ADDITIVE	FUNCTION	QUANTITY OF ADDITIVE (lbs / gal)	%	HOW ADDED BLEND OR MIX WATER	REMARKS
'G'	546	Econolite HR-6-L NF-1	Extender Retarder Anti-foam	363 gal 22 gal 165	.55 gals/sx .06 gals/sx 0.5 lb/1bbl	Mix Water Mix Water Mix Water	Lead Slurry.
'G'	620	Halad 322LXP HR6L	Water loss control	105 gals	136 30gals	Mix Water	Tail Slurry – no losses

THEORETICAL TOP OF CEMENT (m) :	560 m	**AVERAGE SLURRY WEIGHT (ppg) :**	Lead 12.5 Tail 15.8
DISPLACEMENT FLUID :	8.3 ppg Fresh water	**DISPLACEMENT RATE (bbl/min) :**	7.3 (Rig pumps)
PLUG BUMPED WITH (psi) :	Bumped – 2500	**DISPLACEMENT VOLUME (bbl) :**	Calculated 410 Actual 420
REMARKS :	Good returns, spacer at surface when plug bumped.		

3.7 DRILLING FLUID RECAP

The drilling fluid details are found in the drilling fluids recap in Appendix 7.

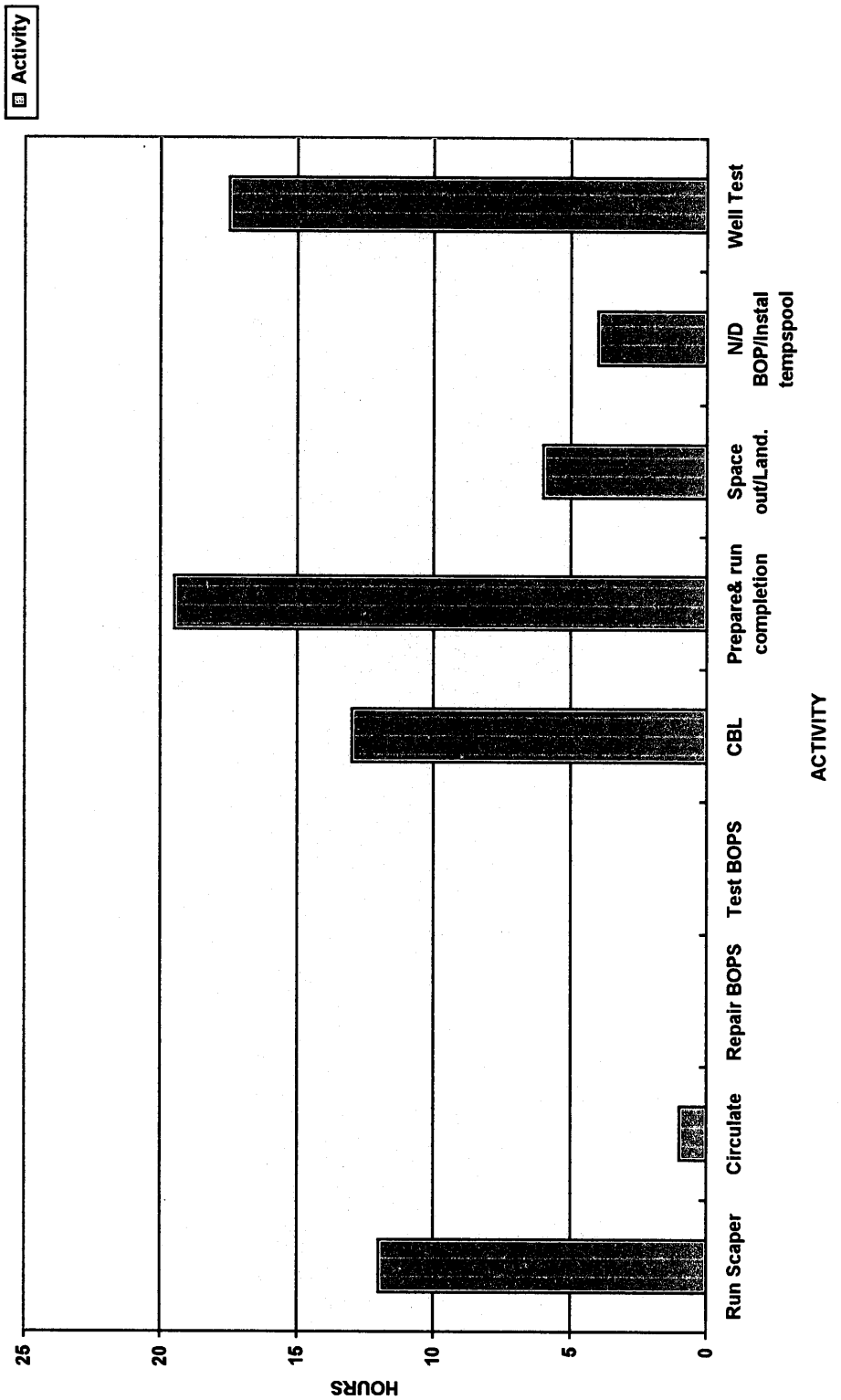
3.8 COMPLETION SUMMARY

The details of the completion for Iona-5 are shown in the completion status diagram shown on Figure 3.2. Completion times achieved were as follows:

Table 3.6 Completion Times

Activity	Hours
Run Scraper	12
Circulate Completion Brine	1.0
Repair BOP's	0.0
Test BOP's	0.0
Run Cement Bond Log	13.0
Prepare TCP completion & Run Tubing	19.5
Spaceout/Land & test tubing	6.0
Nipple down BOP's, install Xmas Tree	4.0
Conduct well test	17.5

FIGURE 3.7: IONA-5 COMPLETION TIME PERFORMANCE



4.0 FORMATION SAMPLING AND TESTING

4.1 CUTTINGS

Cuttings were collected at three metre intervals or as directed from surface to TD. Detailed cuttings descriptions are presented in Appendix 3.

4.2 CORES

4.2.1 Conventional Core

No conventional cores were cut in Iona-5.

4.2.2 Sidewall Cores

No sidewall cores were acquired in Iona-5.

4.3 TESTING

No drill stem tests or wireline formation tests were carried out in Iona-5. Results of the clean up and flow test of the well are presented in Appendix 5.

4.4 SAMPLE ANALYSIS

No petrological or palynological analyses were carried out in Iona-5.

4.5 LOGGING AND SURVEYS

4.5.1 Mud Logging

A standard Halliburton skid mounted unit for continuous recording of depth, penetration rate, mud gas, pump rate, and mud volume data as well as mud chromatographic analysis was operated from surface to total depth. Rate of penetration, weight on bit, total gas and chromatography were recorded and plotted on the Formation Evaluation Log (Mud Log) and are presented in Enclosure 1.

4.6 WIRELINE LOGGING

Wireline logging was carried out by Schlumberger Seaco using a standard truck mounted MAXIS unit. Considerable difficulties were encountered running the open hole logs due to tight hole conditions from about 1465 m to 1511 m MDKB. The hole inclination at this depth was about 56 degrees. After three attempts to run the PEX-HALS-BHC logging suite on wireline a decision was made to run the logs on drill pipe. A side entry sub was made up and the Schlumberger line was pumped to the bottom of the hole. The suite consisting of the Resistivity – Nuclear tools only, was run to TD at 1722 m (logger depth) and logged up from T.D. to 1389 m. Details of the log depth intervals are as follows.

Table 4.1 Details of Wireline Logs run

LOG	Logging/ Processing Date	Depth Logger (mKB)	Depth Driller (mKB)	Top Log Interval	Bottom Log Interval	Max Temp Deg. C
RESISTIVITY CURVES HLLD, HLLS, RXOZ, SP, GR, Caliper: 1:200 & 1:500. GR to surface	02/05/99 03/05/99	1722	1720	656	1722	58,58,58
DIPOLE SONIC: 1:200 & 1:500	02/05/99 03/05/99	1722	1720	656	1460	
NUCLEAR CURVES Neutron (TNPH), Density (RHOZ), Pe (PEFZ), GR, Caliper: 1:200 & 1:500	02/05/99 03/05/99	1722	1720	656	1722	58,58,58
CBL – VDL – GR – CCL: 1:200	07/05/99 07/05/99	1722	1720	75	1710	
GR-CCL, TCP CORRELATION: 1:200 & 1:500	08/05/99 18/05/99	1722	1720	75	1710	
RESIST'Y CURVES TVD INDEX-GR to Surface: 1:200 & 1:500	02/05/99 02/05/99					
NUCLEAR CURVES TVD INDEX-GR to Surface: 1:200 & 1:500	02/05/99 02/05/99					
OFFSET CHECKSHOT SURVEY	07/05/99 07/05/99	1722	1720	135	1707	

Each logging run is included at both 1:200 and 1:500 scale as an enclosure. Enclosures 9 and 10 are composite logs in MDKB and TVDKB format with depths validated to the definitive survey and all curves depth matched and environmentally corrected.

5.0 GEOLOGY

5.1 STRATIGRAPHY

The stratigraphic section penetrated in Iona-5 is shown in Table 5.1. Formation tops were picked on the basis of cuttings descriptions, rate of penetration and wireline logs and by correlation to Iona-1 and Iona-2. Unless otherwise stated all depths are referenced to the Kelly Bushing MDKB and based on the original field logs. The composite well log showing Formation tops for each unit from the top Pebble Point Formation down based on the original field logs is included as Enclosure 2. A detailed composite log for the reservoir section based on the definitive survey run on 6 June 1999, is included as Enclosure 3.

Table 5.1 Stratigraphic section Iona-5

Stratigraphic Unit	Depth			Thickness
	MDKB (m)	TVDKB (m)	TVDSS (m)	MDKB (m)
Ground Level	4.98	4.98	-135.0	
Heytesbury and Nirranda Groups (undifferentiated)				339.3
Narrawaturk Marl				
Mepunga Formation	287.5	287.5	152.5	51.8
Wangerrip Group				328.2
Dilwyn Formation	339.3	339.3	204.3	192.7
Pember Mudstone	532.0	532.0	397.0	84.5
Pebble Point Formation	616.5	616.5	481.5	51.0
Sherbrook Group				1052.5
Paaratte Formation	667.5	667.5	532.5	423.5
Skull Creek Member	1091.0	1010.4	875.4	213.0
Nullawarre Greensand	1304.0	1137.8	1002.8	144.3
Belfast Mudstone	1448.3	1221.1	1086.1	98.2
Flaxman Formation	1546.5	1274.7	1139.7	51.3
Top C1 sand	1597.8	1302.0	1167.0	16.8
Base C1 sand	1614.6	1310.8	1175.8	1.2
Top C2 sand	1615.8	1311.2	1176.2	23.0
Base C2 sand	1638.8	1323.4	1188.4	23.2
Top B sand	1662.0	1335.1	1200.1	5.0
Base B sand	1667.0	1337.6	1202.6	53.0
Total Depth (Driller)	1720.0	1363.8	1228.8	
Total Depth (Logger)	1722.0	1364.8	1229.8	

5.2 LITHOLOGY

Detailed descriptions of each interval sampled are included in Appendix 3 and a summary of each interval is included on the mudlog in Enclosure 1. The following is a summary of the lithological units observed in Iona-5.

5.2.1 Heytesbury and Nirranda Groups

(Surface – 339.3 metres)

5.2.1.1 Port Campbell Limestone

No Port Campbell Limestone was recorded in the well.

5.2.1.2 Gellibrand Marl / Clifton Limestone/ Narrawaturk Marl

From the surface to 287.5 metres the lithology was predominantly marl and the contact between the Gellibrand Marl and the Narrawaturk Marl was not interpreted. The predominant lithology observed was:

Marl: medium greenish grey to brownish grey, very soft, sticky, occasionally silty, common to abundant fossil fragments, massive with trace pyrite and coaly fragments towards the base. The Cilfton Limestone could not be identified or was not present and the boundary between the Gellibrand Marl and the Narrawaturk Marl could not be positively identified on logs.

5.2.1.3 Mepunga Formation (287.5 – 339.3 m)

Sandstone: medium to dark brownish grey, fine to coarse, dominantly coarse, poorly sorted, subangular to subrounded, dominantly subrounded quartz, common iron oxide and limonite coating of grains, rare glauconite, trace pyrite, trace mica, nil to moderate calcareous cement, fair visual porosity.

5.2.2 Wangerrip Group (339.3 – 667.5 m)

5.2.2.1 Dilwyn Formation (339.3 – 532.0 m)

Sandstone: off white to translucent, fine to coarse, dominantly coarse, poorly to moderately sorted, subangular to subrounded, dominantly subrounded quartz, common brown and orange iron oxide stain, occasional pyrite, occasional glauconite, trace mica, good intergranular porosity, interbedded with

Claystone: medium to dark brownish grey, abundant silt, micromicaceous, massive, soft, dispersive.

5.2.2.2 Pember Mudstone (532.0 – 616.5 m)

Claystone: medium to dark brownish grey to grey, nil to moderately silty, trace to common glauconite, trace pyrite, micromicaceous, massive, soft, dispersive.

5.2.2.3 Pebble Point Formation (616.5 – 667.5 m)

Sandstone: light grey to light brownish grey, clear to translucent grains, unconsolidated to friable, predominantly medium to coarse grains, occasionally granule, dominantly coarse, sub angular to sub rounded occasionally rounded, common iron oxide and iron stained quartz, moderate sphericity, moderate to well sorted quartz, nil to common argillaceous matrix, trace to rare nodular pyrite, rare to minor skeletal fragments, friable to firm, good to excellent inferred porosity, interbedded with.

Claystone: medium to dark grey to brownish black in part, soft, dispersive, common to abundant quartz silt to fine sand, grading to arenaceous claystone, nil to trace carbonaceous specks, minor to common glauconite pellets oxidised in part, trace pyrite, trace to rare mica, slightly calcareous, massive, firm to moderately hard..

5.2.3 Sherbrook Group (667.5 – 1720.0 m)

5.2.3.1 Paaratte Formation (667.5 – 1091.0 m)

Sandstone: light grey to light brownish grey, clear to translucent grains, unconsolidated to friable, predominantly medium occasionally coarse grains, sub angular to sub rounded occasionally rounded, moderate sphericity, poorly to moderately sorted quartz, nil to common multicoloured, orange, yellow, greyish blue hard lithic volcanic and siliceous grains, trace to rare nodular pyrite, nil to trace calcareous, moderate to good inferred porosity, interbedded with

Claystone: light to medium grey, soft to firm, dispersive, fissile, laminated, abundant argillaceous matrix, common to abundant very fine sand, common to abundant carbonaceous specks, common mica, trace pyrite, grading to Silty Claystone

Coal: trace to rare specks and laminae, black, soft to firm

5.2.3.2 Skull Creek Mudstone (1091.0 – 1304.0 m)

Siltstone: light to grey to brownish grey interbedded with greyish white laminations in part, soft to firm, dispersive, abundant argillaceous matrix, abundant very fine sand, common to abundant coal specks and laminae, minor mica, trace pyrite, grading to Clayey Siltstone, interbedded with minor to common

Sandstone: very light grey to white, soft, friable, very fine to fine, sub angular to sub rounded, poorly sorted, abundant clay matrix grading to argillaceous sandstone, rare mica, trace to rare pyrite, trace orange lithics, nil to poor visible porosity grading to

Sandstone: light grey to light brownish grey to white, clear to translucent grains, unconsolidated to friable, predominantly fine to coarse occasional very coarse to pebble grains, predominantly angular to sub rounded occasionally rounded, poor to moderate sphericity, moderately sorted, trace to rare pyrite cement, moderate to good inferred porosity.

5.2.3.3 Nullawarre Greensand (1304.0 – 1448.3 m)

Sandstone: light brownish grey to dark yellowish green, clear to translucent grains commonly coated with glauconite, unconsolidated to friable, predominantly fine to medium occasionally coarse, predominantly angular to sub rounded, occasionally rounded and polished grains, poor to moderate sphericity, moderately sorted, common to abundant glauconite grains, rare skeletal fragments, trace foraminifera infilled with glauconite, trace to rare pyrite nodules, good inferred porosity.

5.2.3.4 Belfast Mudstone (1448.3 – 1546.5 m)

Claystone: medium to dark grey to greenish black to occasionally yellowish grey in part, soft to firm, dispersive, rare to minor quartz silt, minor to common , occasionally abundant disseminated and nodular glauconite, rare coal specks, rare mica, trace pyrite

5.2.3.5 Flaxmans Formation (1546.5 – 1597.8 m)

Claystone: medium to dark grey to greenish black to occasionally yellowish grey in part, soft to firm, dispersive, rare to minor quartz silt, minor to common , occasionally abundant disseminated and nodular glauconite, rare coal specks, rare mica, trace pyrite

Sandstone: light brownish grey to greyish brown to dark yellowish green in part, clear to translucent grains commonly coated with glauconite, unconsolidated to friable, predominantly fine to medium occasionally coarse, predominantly angular to sub rounded, occasionally rounded and polished grains, poor to moderate sphericity, moderately sorted, common to abundant glauconite grains, rare skeletal fragments, trace foraminifera infilled with glauconite, trace to rare pyrite nodules, good inferred porosity.

5.2.4 Waarre Formation

5.2.4.1 Unit C (1597.8 – 1662.0 m)

Sandstone: light brownish grey to very light grey, fine to coarse, dominantly medium, moderately to well sorted, subangular to subrounded, firm to friable, predominantly loose and unconsolidated, trace pyrite, good to excellent visual porosity.

Claystone: medium to dark grey, soft to firm, dispersive, rare to minor carbonaceous laminations and specks, trace pyrite, trace resin

Coal: black, moderately hard, conchoidal fracture, vitreous.

5.2.4.2 Unit B (1662.0 – 1720.0 m)

Calcareous Sandstone: very light grey to white, fine to coarse occasionally very coarse, fair sphericity, moderately to well sorted, subangular to subrounded, firm to friable, predominantly loose and unconsolidated, 30 to 40 percent calcareous matrix, trace pyrite, common white to very light grey argillaceous matrix, trace carbonaceous fragments, grading to.

Sandstone: light brownish grey to very light grey, fine to coarse, dominantly medium, moderately to well sorted, subangular to subrounded, firm to friable, predominantly loose and unconsolidated, trace pyrite, good visual porosity

Claystone: medium to dark grey, soft to firm, dispersive, rare to minor carbonaceous laminations and specks, trace pyrite, trace resin

6.0 VELOCITY SURVEY

6.1 SEISMIC CALIBRATION AND RESULTS

A velocity or checkshot survey was carried out by Schlumberger as part of the open-hole logging program in Iona-5. The source used for the survey was an airgun, with shots fired into a water filled pit dug at a surface location (E: 676628.6 N: 5728294.3 RL: 95.62m) over the Waarre C intersection in the well. The location of the pit directly above the Waarre C in the well was chosen to minimise any corrections due to seismic path distortion thereby permitting a direct tie into the 3D seismic data at the mapped Waarre C level.

A total of 22 levels were acquired in the survey. A single shot was used where a good first break was encountered on the record. Additional shots were fired at locations where the signal was poor. The data was then enhanced by stacking the shots together to obtain an acceptable first break on the record. Quality of the data obtained was generally good except for the records from near the surface casing shoe and at the sea level datum where casing and surface noises masked good records.

The data was processed by Schlumberger at their Melbourne processing centre. First breaks were picked from the edited data and corrections applied to obtain a set of time versus depth values below the seismic reference datum which was mean sea level.

6.2 DATA CORRECTIONS

The corrections applied consisted of the following:

6.2.1 Correction for Deviated Hole

The well was drilled as a deviated and hold hole through the reservoir section, so the depths, which were measured with reference to KB, were converted to true vertical depth. Conversion to true vertical depth was made using a combination of the single and multi-shot survey data obtained during the drilling of the well. A linear interpolation was used to correct the measured depth value to true vertical depth for checkshots recorded between surveyed points.

6.2.2 Correction for shot and geophone geometry

The travel path of the wave as it travels from the source point is not vertical. A correction was made to the travel time values of the checkshot data to account for the non-vertical path so as to obtain a corrected vertical time from source for each checkshot.

6.2.3 Correction for datum

The checkshot survey was acquired at a near surface location. The reference datum for the Iona 3D Seismic Survey is sea level. The travel time from the surface source to datum has to be subtracted from the corrected vertical time derived above to match the datum used in the seismic survey. The datum correction consists of two components:

- A weathering or statics component,

  This is the delay in time as a result of the seismic wave travelling in the weathered zone near the surface. The weathered zone generally has a lower velocity than the sub-weathered zone.

- An elevation component,

  This takes into account the elevation above the datum where the source is located and the sub-weathered velocity.

For ease of computation, the static and elevation correction is replaced by a term called the replacement velocity, which represents the average velocity of the energy from the source travelling to datum.

An uphole survey (Uphole 5) was carried out over the reservoir location of Iona-5. The uphole yielded a datum correction from the surface of 72.2 msec and replacement velocity of 1454 m/s, which was used in the generation of Schlumberger's Geogram

Sonic log was not run in the well from below 1460 mdKB because unstable hole condition prevents its running. Sonic log from the interval 1320 m KB to 1460 m KB showed cycle skipping of data resulting in poor quality log over the interval. As a result lithological interpretation based on other available logs was carried out by Schlumberger on its ELAN system over the poor quality interval and sonic velocities back-calculated from the interpreted litholgy present. The derived sonic log was integrated with BHC sonic logs recorded and calibrated against the checkshot results. A vertical impedance log was then derived from the calibrated sonic and the depth corrected density log. Three Ricker wavelets of predominant frequencies of 25, 30 and 35 Hertz respectively were convolved with the impedance log to produce the synthetic seismograms. Further details of the calibration, checkshot corrections and synthetic seismogram generation can be found in the accompanying Schlumberger Well Seismic Edit and Geogram Report. (Appendix 4)

6.3 RESULTS

Enclosure 8 shows the synthetic seismogram spliced onto the seismic section through the well annotated with the tops encountered. The derived synthetic seismogram matched the seismic data very well at the bottomhole location of the Iona-5 well. The synthetic confirmed that the event mapped as the Top Waarre C in the 3D seismic interpretation carried out prior to the drilling of the well to be correct. The match at the shallower horizons is not as good but this is not unexpected because the well is

deviated. The assumption of a vertical well path from the source becomes less valid as the lateral distance of the source to the detector for the shallower horizon increases. Furthermore, the intersection of the shallow horizons is not as shown at the Waarre C intersection for which the synthetic is depicted.

The depth prognosis for the Waarre C and all horizons below the Nullawarre Greensand was deeper than they were encountered in the well. The prognosed depths for the horizons above the Nullawarre is generally shallower than encountered.

Table 6.1 compares the Prognosed Depths and the Actual Well Depths for the main horizons encountered in the well. The original prognosis was made on the assumption that there was no velocity gradient over the field and that the velocities in Iona-1 and Iona-2 were representative of the total field area. The results of the well indicate this assumption to be incorrect and showed that a velocity gradient occurs between Iona -1 & 2 and Iona-5.

Table 6.1 Comparison of Prognosed and Actual Depths

Formation Tops	Original Prognosis(metres TVD subsea)	Actual Depth (metres TVD subsea)	Difference
Heytesbury Group	Surface	Surface	
Narrawaturk Marl	68	65.5	-2.5
Mepunga Formation	146	152.5	6.5
Dilwyn Formation	202	204.3	2.3
Pember Mudstone	409	397.0	-12.0
Pebble Point Formation	479	481.5	2.5
Paaratte Formation	523	532.5	9.5
Skull Creek Member	873	875.4	2.4
Nullawarre Greensand	1007	1002.8	-4.2
Belfast Mudstone	1113	1086.1	-26.9
Waare Formation D unit	1152	1139.7	-12.3
Top C1 Sand	1182	1167.0	-15.0
Base C1 Sand	NP*	1175.8	
Top C2 Sand	1194	1176.2	-17.8
Base C2 Sand	NP	1188.4	
Top B Sand	NP	1200.1	
Base B Sand	NP	1202.6	
Total Depth	1250	1228.8	-21.2
NP* depth not prognosed			

Figure 6.1 is a plot that compares the measured average velocities and interval velocities from the Iona-1, -2 and 5 wells. The figure shows a lower average velocity to the top Waarre C at Iona-5 compared to Iona-1 and 2.and this resulted in the well coming in shallower than prognosed. The lower average velocity to the top of the Waarre C is caused by the presence lower interval velocities within the Tertiary and Upper Cretaceous sections in the well.

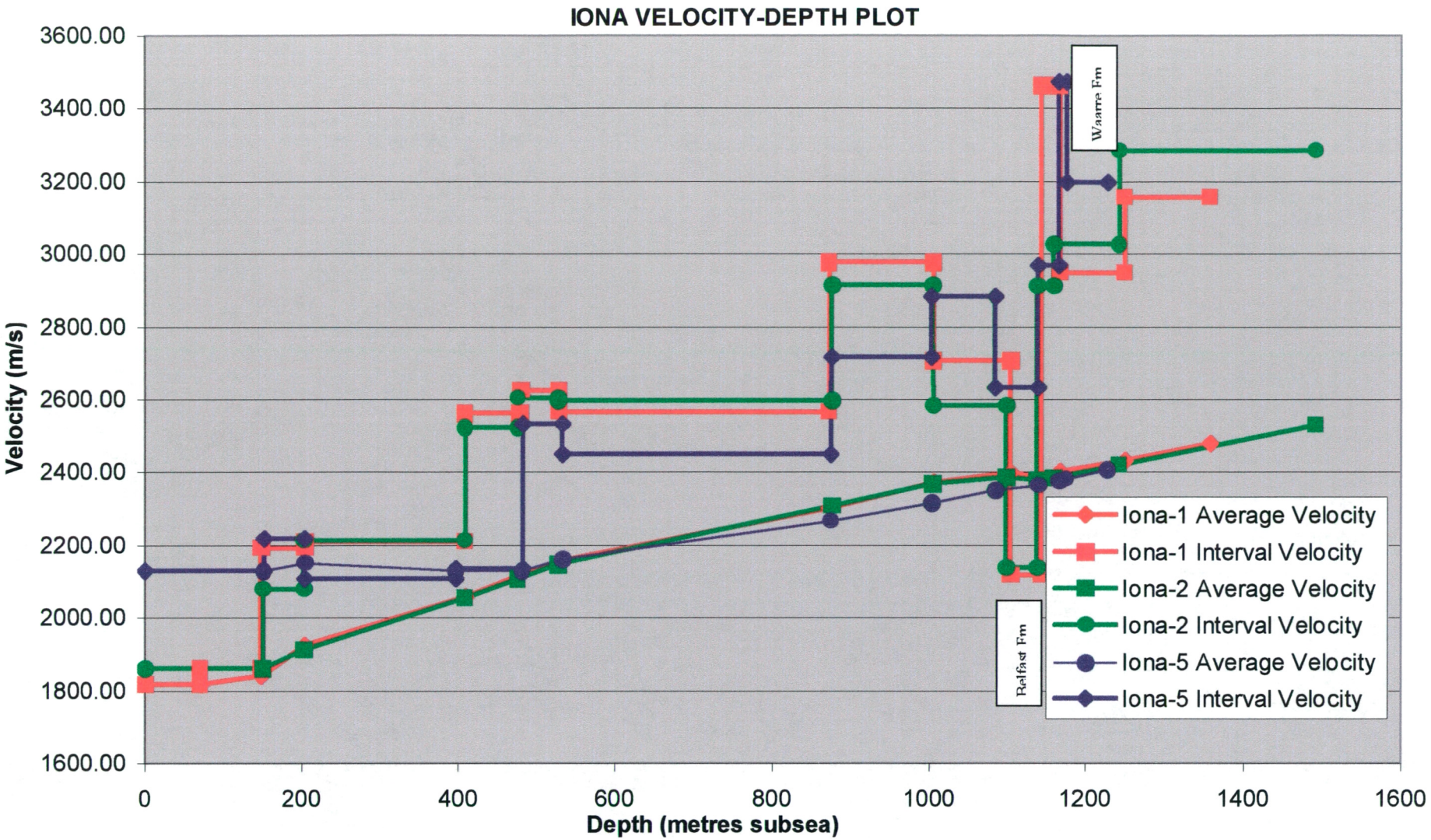


Figure 6.1: Comparison of Velocity Depth plots for Iona-1, 2 and 5

7.0 PETROPHYSICS

7.1 DATABASE

Field logs were acquired by Schlumberger using the Platform Express logging suite. Tool measurements included, nuclear, resistivity and sonic. Schlumberger carried out a number of post-logging services including:

- Borehole environment corrections;
- Shoulder bed corrections (except for Iona-1);
- Estimation of true formation resistivity, ***Rt*** (except for Iona-1);
- Conversion to true vertical depth, KB datum; and,
- Data re-sampling to a consistent 0.1 metre depth step.

The processed log data was supplied in LAS format. This data was loaded into the ***G-Pick*** software system for subsequent display and interpretation.

The ambient and overburden core data, including measurement of porosity, permeability and grain density were key punched and also loaded into the system. The core data matches log depth within an acceptable tolerance. A psuedo log, 'PHIO', was created by correcting the ambient core porosity to overburden conditions using the calibration provided by the limited core measurements at overburden pressures.

To evaluate the Waarre Formation a normalised gamma ray log, 'GRN', was calculated as the percentage deflection between the cleanest reservoir and the shale between Waarre B and C sandstones. This corrects for the distortion provided by KCl mud systems and different hole diameters and provides a log comparable with other Iona wells. Thereafter, a 'GRHB' log was calculated as the product of GRN times RHOB with the objective that this may better highlight the transition between reservoir and non-reservoir.

The photoelectric log is distorted due to the effect of barite in the mud system and the sonic log shows a significant gas effect. Both logs were rejected for quantitative analysis.

7.2 PETROPHYSICAL MODEL

The petrophysics were modelled using the ***FAST*** (***F***ormation ***A***nalysis using ***S***tatistical ***T***echniques) computer program, which is typical of current log analysis technology, based upon inverse, statistical algorithms.

The mineral model was constructed using Illite, Kaolinite, Quartz and Silt, which is consistent with the core petrology. The logging tool responses for mineral endpoints were selected from chartbook tables. The clay minerals are defined as the dry clay endpoints and the bound water content is calculated dependent upon the salinity and temperature of the reservoir formation water. Wet clay endpoints are re-computed within the software. The endpoint parameters for the clay minerals expressed as GRHB were determined at first by conversion of average chartbook GR and RHOB and then by trial and error. The parameters for Silt were based on general empirical evidence that "shales" comprise clay minerals and silt with the latter a mixture of

quartz, carbonates, micas and etcetera. The endpoints are generally taken to be between those of quartz and limestone but with an intermediate GR level. The hypothetical "shale" endpoint assumed ~67% wet clays and 33% silt. This provides a reasonable solution of the neutron log.

The Dual Water saturation equation was selected since this is the default for Schlumberger's ELAN software.
The cementation exponent, m^0, was calculated using the equation of Goode and Sen (1988) and this provides a dynamic solution at each data level dependent upon the porosity and CEC. This equation includes a small correction to m^* for the bound water layer in order that the cementation exponent is consistent with principles of the Dual Water equation.

The resistivity of formation water was accepted as 1.0 ohmm at 75 degrees F following analysis of all Iona wells.

7.3 LOG ANALYSIS RESULTS

The results of the log analysis are shown on the striplog and a description of the mnemonics is included as a facing page to the figure.

There has been production of 8.4 Bcf prior to field shutin at December 1997. The current gas/water contact has been observed field-wide at –1,185 metres subsea. In Iona-5 this corresponds to 1,320.2 mTVD-KB which is at the base of a large gas effect on the density-neutron and a shift in the resistivity. A summary of the petrophysics is tabulated as follows:

Table 7.1 Iona-5: Petrophysics Summary

Iona-5 : Petrophysics Summary			
Unit	***Pay (metres)***	***Porosity %***	***Water Saturation %***
Flaxman	7.3	25.6	30.3
C - gross	19.7	26.1	24.3
B	2.6	27.0	32.0

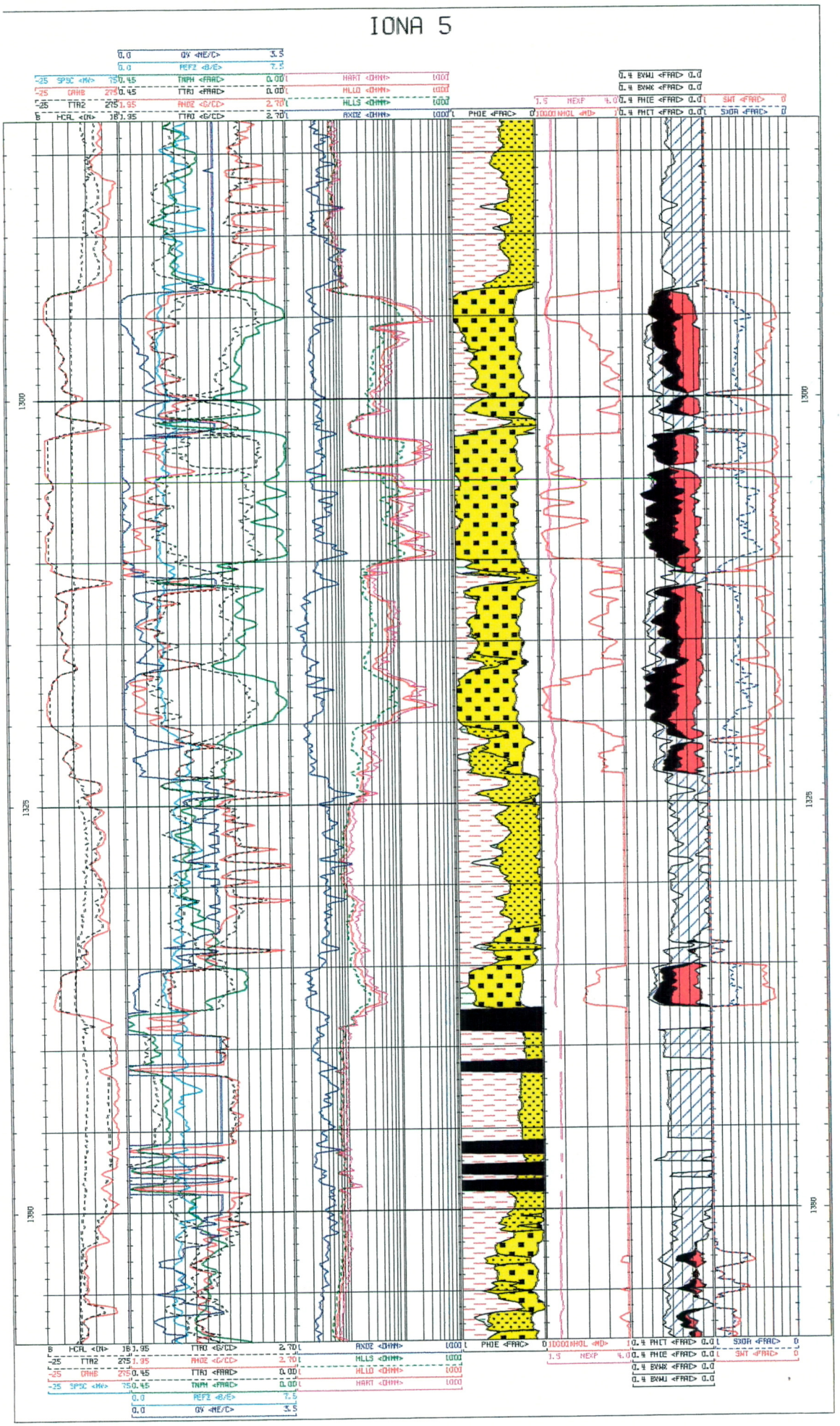


Figure 7.1

7.4 *FAST* – STRIPLOG DESCRIPTION

Track 1:		depth scale in metres TVD-KB
Track 2:		
	CALI / CALS / HCAL	caliper - short dash, black
	TTR2	theoretical gamma ray/density - short dash, black
	GRHB	gamma ray % deflection x density - solid line, red
	SP	spontaneous potential - solid line, cyan
Track 3:		
	TTR0	theoretical density - short dash, black
	RHOZ / RHOB	density - solid line, red
	TTR1	theoretical neutron - short dash, black
	TNPH / NPHI	neutron environment corrected - solid line, green
	PEFZ / PEF / PEF	photoelectric environment corrected - solid line, cyan
	Qv	cation exchange capacity per unit pore volume - solid line, dark blue
Track 4:		
	RXOZ / MSFL / RXO	micro-laterolog - solid line, dark blue
	HLLS / SLLC / LLS	shallow laterolog environment corrected - short dash, green
	HLLD / DLLC / LLD	deep laterolog environment corrected - solid line, red
	HART / RT	true resistivity - solid line, magenta
Track 5:		
	wet Illite	pink clay pattern
	wet Kaolinite	green mudstone pattern
	Silt	siltstone pattern
	Quartz	coarse sandstone pattern
	Phie	effective porosity (white space to left of right margin)
Track 6:		
	KHOL	permeability from Goode & Sen equation - solid line, red; scale: 10 D to 1 mD
	MEXP	cementation m^0 exponent calculated from ϕ_T and Qv - solid line, magenta
Track 7:		
	PHIO	core porosity (ambient data corrected to overburden) – cyan box symbols
	PHIT	total porosity (bound water porosity plus effective porosity) - separation between curves indicates bulk volume of bound water or ϕ_{BW} - shown as diagonal blue hatch
	PHIE	effective porosity -separation between curves indicates *residual hydrocarbons* coloured black
	BVWX	bulk volume of water in the flushed zone - separation between curves indicates *moveable oil* coloured red
	BVWU	bulk volume of water in the unflushed zone - separation between curves indicates *far water* (free water and capillary water) - shown as unfilled grid towards the right margin
Track 8:		
	SXO	water saturation in the flushed zone - short dash, dark blue
	SWT	total water saturation in the unflushed zone total porosity - solid line, red
Track 9:		depth scale in metres TVD-KB

APPENDIX 1

Daily Drilling Reports by Kelly Down Pty. Ltd.

908215 050

TUAUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	19-Apr-99
REPORT No:	1
D.F.S:	
SHOE F.I.T:	

WELL NAME: Iona # 5 **STATUS @ 2400 HRS:** Rig down to move to Iona # 5

DEPTH - 2400 HRS:	m	FORMATION:		KB - GL (m):	
DEPTH - PREVIOUS:	m	HOLE SIZE:		SHOE DEPTH:	
24 HR PROGRESS:	m	ACCIDENTS:	nil	LAST CASING:	
SAFETY MEETINGS:	Discussed expected activities and testing.				

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)		
VISCOSITY		
pH		
PV / YP		
GELS 0/10		
WL API / FC (cc)		
SOLIDS %		
SAND %		
CHLORIDES		
KCL ppb		
MBT (ppb)		
Pm Pm/Mf		
TEMP (degC)		
HOLE VOL (bbls)		
SURFACE VOL (bbls)		
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	Gerald Lange	

SOLIDS CONTROL		
UNIT	GPM / HRS	OF / UF
DESILTER		
DESANDER		
MUDCLEANER		
CENTRIFUGE		
SHAKER SCREENS:		

INVENTORY	
BARITE	488 sx
GEL	84 sx
CEMENT	150 sx
SALT	sx
KCL	146 sx
DRILLWATER	bbl
DIESEL FUEL	12,550 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM		
PRESSURE		
GPM		
AV (DP - ft/min)		
AV (DC - ft/min)		
SPR @		
SPR PRESS		

DRILLS / BOPS	
LAST BOP DRILL	
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	
NEXT BOP TEST	
DAYS SINCE LAST LTA	72

BIT DATA		
BIT No.		
SIZE (ins)		
TYPE		
IADC CODE		
SERIAL No.		
NOZZLES		
OUT (m)		
IN (m)		
DRILLED (m)		
HOURS		
CONDITION		
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
T.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP - down	7
3. DRILLING	
4. BIT TRIP	
5. WIPER TRIP	
6. SURVEY	
7. CIRC / COND	
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19.COMPLETION	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	7

BHA.:

BHA WEIGHT :	lbs	STRING WT.:	lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ../2

908215 051

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	19-Apr-99
REPORT No:	1
D.F.S:	

TU AUSTRALIA

WELL NAME: Iona # 5 **STATUS @ 2400 HRS:** Rig down to move to Iona # 5

FROM	TO		24 HOUR SUMMARY
17:00	24:00	7	Rig down prepare to move to Iona # 5.
			Rigged down floor, Laid mast down, unstring blocks.
			Incidents last 24hr: no
			Obs-1 sump cleaned and 90% backfilled.
			- Weather : Overcast rain

DOWNHOLE TOOLS

Hours	Serial No.	Tool

FORMATION TOPS :

OPERATION TO 0600 HRS Rig Down & move

-

PROGRAM - NEXT 24 HRS *Move to Iona #5 Rig up.*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
Transport -4	
WATER HAULER	12.00
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	3
SERVICE CO	8
TOTAL :	**31**

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY	Westman / Lambert

END OF REPORT

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

TU AUSTRALIA — **WUGS** Western Underground Storage Project

DATE:	20-Apr-99
REPORT No:	2
D.F.S:	
SHOE F.I.T:	

WELL NAME: IONA #5 **STATUS @ 2400 HRS:**

DEPTH - 2400 HRS:	m	FORMATION:		KB - GL (m):	4.98
DEPTH - PREVIOUS:	m	HOLE SIZE:		SHOE DEPTH:	
24 HR PROGRESS:	m	ACCIDENTS:	NIL	LAST CASING:	

SAFETY MEETINGS: Crane use

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)		
VISCOSITY		
pH		
PV / YP		
GELS 0/10		
WL API / FC (cc)		
SOLIDS %		
SAND %		
CHLORIDES		
KCL (% WT)		
MBT (ppb)		
Pm Pm/Mf		
TEMP (degC)		
HOLE VOL (bbls)		
SURFACE VOL (bbls)		
HOLE LOSSES (bbls)		
MUD CO		
MUD ENGINEER	G. Lange	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER		
DESANDER		
MUDCLEANER		
CENTRIFUGE		
SHAKER SCREENS:		

INVENTORY	
BARITE	sx
GEL	sx
CEMENT	sx
SALT	sx
KCL	sx
DRILLWATER	bbl
DIESEL FUEL	lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM		
PRESSURE		
GPM		
AV (DP - ft/min)		
AV (DC - ft/min)		
SPR		
SPR PRESS		

DRILLS / BOPS	
LAST BOP DRILL	
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	
NEXT BOP TEST	
DAYS SINCE LAST LTA	

BIT DATA		
BIT No.		
SIZE (ins)		
TYPE		
IADC CODE		
SERIAL No.		
NOZZLES		
OUT (m)		
IN (m)		
DRILLED (m)		
HOURS		
CONDITION		
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

TIME ANALYSIS	
1. MOVE RIG	24
2. RIG UP	
3. DRILLING	
4. BIT TRIP	
5. WIPER TRIP	
6. SURVEY	
7. CIRC / COND	
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	24

BHA.:

BHA WEIGHT :	lbs	STRING WT.:	lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ../2

908215 053

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	20-Apr-99
REPORT No:	2
D.F.S:	

TU AUSTRALIA

WELL NAME: IONA #5

STATUS @ 2400 HRS: Rig Move.

FROM	TO		24 HOUR SUMMARY
0:00	0:00	24	Crews did not break to daylight tour only.
			Move rig to IONA #5. Slot #7.
			Rig move 70% complete.
			Incidents in last 24 Hours Y/N
			(If yes see separate report)
			- Weather : Showers / Cold.

DOWNHOLE TOOLS		
Hours	Serial No.	Tool

FORMATION TOPS :

OPERATION TO 0600 HRS :

PROGRAM - NEXT 24 HRS :

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	6hr
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	3
SERVICE CO	4
TOTAL :	27

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	Westman/ Lambert

END OF REPORT

908215 054

TUAUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	21-Apr-99
REPORT No:	3
D.F.S:	
SHOE F.I.T:	

WELL NAME: IONA #5 **STATUS @ 2400 HRS:** Prepare BHA.

DEPTH - 2400 HRS:	m	FORMATION:		KB - GL (m):	4.98
DEPTH - PREVIOUS:	m	HOLE SIZE:		SHOE DEPTH:	
24 HR PROGRESS:	m	ACCIDENTS:	NIL	LAST CASING:	
SAFETY MEETINGS:	Pre spud.				

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	9.0	EZ-MUD 2
VISCOSITY	52	KWIKSEAL M 10
pH	8 . 3	PAC_R 2
PV / YP	12 / 14	P/CHL 1000x1
GELS 0/10	6 / 15	XCD 2
WL API / FC (cc)	7 . 6	
SOLIDS %	3 . 8	
SAND %	0 . 3	
CHLORIDES	21,500	
KCL (% WT)	12 . 4	
MBT (ppb)	15	
Pm Pm/Mf	.05 / .6	
TEMP (degC)		
HOLE VOL (bbls)		
SURFACE VOL (bbls)	460	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	G. Lange	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER		
DESANDER		
MUDCLEANER		
CENTRIFUGE		
SHAKER SCREENS:	3 x 84	3 x 84

INVENTORY	
BARITE	488 sx
GEL	84 sx
CEMENT	150 sx
SALT	sx
KCL	146 sx
DRILLWATER	bbl
DIESEL FUEL	lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM		
PRESSURE		
GPM		
AV (DP - ft/min)		
AV (DC - ft/min)		
SPR		
SPR PRESS		

DRILLS / BOPS	
LAST BOP DRILL	
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	
NEXT BOP TEST	
DAYS SINCE LAST LTA	74

BIT DATA		
BIT No.		
SIZE (ins)		
TYPE		
IADC CODE		
SERIAL No.		
NOZZLES		
OUT (m)		
IN (m)		
DRILLED (m)		
HOURS		
CONDITION		
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	24
3. DRILLING	
4. BIT TRIP	
5. WIPER TRIP	
6. SURVEY	
7. CIRC / COND	
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	24

BHA.:

BHA WEIGHT :	lbs	STRING WT.:	lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ../2

908215 055

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	21-Apr-99
REPORT No:	3
D.F.S:	

WELL NAME: IONA #5 **STATUS @ 2400 HRS:** Prepare BHA.

FROM	TO		24 HOUR SUMMARY
0:00	0:00	24	Rig Move & rig up. Drill Rat & mouse Hole.Make up 17 1/2" bit, prepare BHA.
			Incidents in last 24 Hours Y/N
			(If yes see separate report)
			- Weather : Showers / Cold.

DOWNHOLE TOOLS		
Hours	Serial No.	Tool

FORMATION TOPS :

OPERATION TO 0600 HRS : Spudded in at 00:01 hrs drilling ahead at 42m.

PROGRAM - NEXT 24 HRS : *Drill 17 1/2" hole*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	3
SERVICE CO	5
TOTAL :	28

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	Westman/ Lambert

END OF REPORT

908215 056

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

TU AUSTRALIA

WUGS Western Underground Storage Project

DATE:	22-Apr-99
REPORT No:	4
D.F.S:	1.0
SHOE F.I.T:	

WELL NAME: IONA #5 **STATUS @ 2400 HRS:** Drilling

DEPTH - 2400 HRS:	274 m	FORMATION:	Clay	KB - GL (m):	4.98
DEPTH - PREVIOUS:	0 m	HOLE SIZE:	17 1/2"	SHOE DEPTH:	
24 HR PROGRESS:	274 m	ACCIDENTS:	NIL	LAST CASING:	
SAFETY MEETINGS:	Handle BHA				

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	8 . 9	
VISCOSITY	50	Baracor 129 x 1
pH	8 . 3	EZ-Mud x 6
PV / YP	11 / 19	PAC_R x 7
GELS 0/10	6 / 14	PotChlor 4000 kg
WL API / FC (cc)	8 . 4	XCD x 8
SOLIDS %	3 . 1	Pot Hydro x 3
SAND %	0 . 75	
CHLORIDES	24,000	
KCL (% WT)	14 . 7	
MBT (ppb)	10	
Pm Pm/Mf	.07 / .50	
TEMP (degC)	35	
HOLE VOL (bbls)	246	
SURFACE VOL (bbls)	326	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	G. Lange	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER	24	
DESANDER		
MUDCLEANER		
CENTRIFUGE	24	
SHAKER SCREENS:	3 x 84	3 x 84

INVENTORY	
BARITE	488 sx
GEL	84 sx
CEMENT	150 sx
SALT	sx
KCL	386 sx
DRILLWATER	bbl
DIESEL FUEL	8,500 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM	140	140
PRESSURE	1150	1150
GPM	790	
AV (DP - ft/min)	69	
AV (DC - ft/min)	80	
SPR		
SPR PRESS		

DRILLS / BOPS	
LAST BOP DRILL	
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	
NEXT BOP TEST	
DAYS SINCE LAST LTA	76

BIT DATA		
BIT No.	1	
SIZE (ins)	17 1/2"	
TYPE	GTX-G1	
IADC CODE	1/01/05	
SERIAL No.	A13KC	
NOZZLES	2x18, 1x24	
OUT (m)		
IN (m)	0	
DRILLED (m)	274	
HOURS	18.5	
CONDITION	in	
AVG ROP (m/hr)	14.80	
WOB (x1000 lbs)	May-15	
RPM	110 - 130	
JET VEL (ft/sec)	274	
HHP @ BIT		

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		
46	0.50	
150	3/4	N26E

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	8.6
ECD (ppg)	9.1

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	18.5
4. BIT TRIP	
5. WIPER TRIP	3
6. SURVEY	0.5
7. CIRC / COND	0.5
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	1.5
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	24

BHA.:

BHA WEIGHT :	65 lbs	STRING WT.:	65 lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	70 amps	DRAG UP :	70 lbs
TORQUE OFF BTM :	110 amps	DRAG DOWN :	60 lbs

CONTINUED ../2

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	22-Apr-99
REPORT No:	4
D.F.S:	1.0

TU AUSTRALIA

WELL NAME: IONA #5 **STATUS @ 2400 HRS:** Drilling

FROM	TO		24 HOUR SUMMARY
0:00	6:00	6	Spud in , drilled 17 1/2" hole to32m.
6:00	7:30	1.5	Repairs to stand pipe union.
7:30	12:00	4.5	Drilled to 123m.
12:00	12:30	0.5	Circulated hole clean.
12:30	15:30	3	Wiper trip, install 17 1/2" NB stab & 2 STR Stab
15:30	17:30	2	Drilled to 164m.
17:30	18:00	0.5	Run wire line single shot survey.
18:00	24:00	6	Drilled to274m.
			Incidents in last 24 Hours Y/N
			(If yes see separate report)
			- Weather : Cold

DOWNHOLE TOOLS

Hours	Serial No.	Tool
8	55053132	NB STAB
8	5048	STR STAB
8	A228	STR STAB
117		Drlg Jars

FORMATION TOPS :

OPERATION TO 0600 HRS :

PROGRAM - NEXT 24 HRS : *Drill 17 1/2" hole*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	2
SERVICE CO	6 .
TOTAL :	**28**

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	Westman/ Lambert

END OF REPORT

908215 058

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	23-Apr-99
REPORT No:	5
D.F.S:	2.0
SHOE F.I.T:	

WELL NAME: IONA #5 **STATUS @ 2400 HRS:** Drilling

DEPTH - 2400 HRS:	621 m	FORMATION:	Clay	KB - GL (m):	4.98
DEPTH - PREVIOUS:	274 m	HOLE SIZE:	17 1/2"	SHOE DEPTH:	
24 HR PROGRESS:	347 m	ACCIDENTS:	NIL	LAST CASING:	

SAFETY MEETINGS: Prepare casing

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	9.0	
VISCOSITY	50	Baracor 129 x 2
pH	8 . 1	EZ-Mud x 15
PV / YP	13 / 26	PAC_R x 9
GELS 0/10	9 / 17	PotChlor 5000 kg
WL API / FC (cc)	8 . 4	XCD x 20
SOLIDS %	3 . 9	Pot Hydro x 10
SAND %	1 . 5	Pot Chlor x 70
CHLORIDES	20,000	
KCL (% WT)	13 . 3	
MBT (ppb)	11 . 5	
Pm Pm/Mf	.05 / .50	
TEMP (degC)	50	
HOLE VOL (bbls)	576	
SURFACE VOL (bbls)	385	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	G. Lange	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER	24	
DESANDER		
MUDCLEANER		
CENTRIFUGE	24	
SHAKER SCREENS:	3 x 84	3 x 84

INVENTORY	
BARITE	808 sx
GEL	84 sx
CEMENT	1,800 sx
SALT	sx
KCL	576 sx
DRILLWATER	bbl
DIESEL FUEL	24,237 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM	140	140
PRESSURE	1450	1450
GPM	790	
AV (DP - ft/min)	69	
AV (DC - ft/min)	80	
SPR		
SPR PRESS		

DRILLS / BOPS	
LAST BOP DRILL	
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	
NEXT BOP TEST	
DAYS SINCE LAST LTA	77

BIT DATA		
BIT No.	1	
SIZE (ins)	17 1/2"	
TYPE	GTX-G1	
IADC CODE	1/01/05	
SERIAL No.	A13KC	
NOZZLES	2x18, 1x24	
OUT (m)		
IN (m)	0	
DRILLED (m)	621	
HOURS	41 . 5	
CONDITION	in	
AVG ROP (m/hr)	15.00	
WOB (x1000 lbs)	5 - 20	
RPM	100 - 110	
JET VEL (ft/sec)	274	
HHP @ BIT		

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		
325	0.75	N17E

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	8.6
ECD (ppg)	9.1

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	23
4. BIT TRIP	
5. WIPER TRIP	
6. SURVEY	0.5
7. CIRC / COND	
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	0.5
30. SLIP & CUT LINE	
TOTAL	24

BHA.: Bit, NB stab, 1 x 8"nmdc, SS, 2 x 8" dc, SS, 3 x 8"dc, 2 x XO, 12 x 5"hwdp
Drlg Jars, 17 x 5"hwdp XO sub.

BHA WEIGHT :	60,000 lbs	STRING WT.:	88,000 lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	70 amps	DRAG UP :	93,000 lbs
TORQUE OFF BTM :	110 amps	DRAG DOWN :	83,000 lbs

CONTINUED ../2

908215 059

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	23-Apr-99
REPORT No:	5
D.F.S:	2.0

TU AUSTRALIA

WELL NAME: IONA #5 **STATUS @ 2400 HRS:** Drilling

FROM	TO		24 HOUR SUMMARY
0:00	4:30	4.5	Drilled from 274 to 337m. Swept hole with 40 bbl hi-vis lcm pill at 320m.
4:30	5:00	0.5	Ran wire line single shot survey.
5:00	10:30	5.5	Drilled to 432m.
10:30	11:00	0.5	Rig serviced.
11:00	0:00	13	Drilled to 621m.

DOWNHOLE TOOLS		
Hours	Serial No.	Tool
31	55053132	NB STAB
31	5048	STR STAB
31	A228	STR STAB
140		Drlg Jars

Incidents in last 24 Hours Y/N
(If yes see separate report)

- Weather : Cold

FORMATION TOPS :

OPERATION TO 0600 HRS : Drilled to section TD at 656m.

PROGRAM - NEXT 24 HRS : *Drill 17 1/2" hole, wiper trip, pull out lay out BHA, rig up run & cement 13 3/8" casing*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	2
SERVICE CO	9
TOTAL :	31

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	Westman/ Lambert

END OF REPORT

908215 060

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	24-Apr-99
REPORT No:	6
D.F.S:	3.0
SHOE F.I.T:	

WELL NAME: IONA # 5 **STATUS @ 2400 HRS:** Cement 13 3/8" casing

DEPTH - 2400 HRS:	656 m	FORMATION:		KB - GL (m):	4.98
DEPTH - PREVIOUS:	621 m	HOLE SIZE:	17 1/2"	SHOE DEPTH:	656
24 HR PROGRESS:	35 m	ACCIDENTS:	NIL	LAST CASING:	13 3/8"
SAFETY MEETINGS:	Running casing				

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	9.0	
VISCOSITY	48	Baracide x 1
pH	8 . 1	Kwikseal m x 10
PV / YP	12 / 22	Barite x 80
GELS 0/10	8 / 16	
WL API / FC (cc)	8 . 4	
SOLIDS %	3 . 7	
SAND %	0 . 75	
CHLORIDES	23,000	
KCL (% WT)	14.00	
MBT (ppb)	11 . 5	
Pm Pm/Mf	.05 / .45	
TEMP (degC)		
HOLE VOL (bbls)	327	
SURFACE VOL (bbls)	490	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	G. Lange	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER	24	
DESANDER		
MUDCLEANER		
CENTRIFUGE	24	
SHAKER SCREENS:	3 x 84	3 x 84

INVENTORY	
BARITE	728 sx
GEL	84 sx
CEMENT	1,800 sx
SALT	sx
KCL	576 sx
DRILLWATER	bbl
DIESEL FUEL	18,237 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM		
PRESSURE		
GPM		
AV (DP - ft/min)		
AV (DC - ft/min)		
SPR		
SPR PRESS		

DRILLS / BOPS	
LAST BOP DRILL	
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	
NEXT BOP TEST	
DAYS SINCE LAST LTA	78

BIT DATA		
BIT No.	1	
SIZE (ins)	17 1/2"	
TYPE	GTX-G1	
IADC CODE	1/01/05	
SERIAL No.	A13KC	
NOZZLES	2x18, 1x24	
OUT (m)		
IN (m)	0	
DRILLED (m)	656	
HOURS	48	
CONDITION	2 - 3 - IN	
AVG ROP (m/hr)	13.60	
WOB (x1000 lbs)	5 - 20	
RPM	100	
JET VEL (ft/sec)	274	
HHP @ BIT		

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	6.5
4. BIT TRIP	2
5. WIPER TRIP	4.5
6. SURVEY	1
7. CIRC / COND	2.5
8. CHANGE BHA	
9. CASE & CEMENT	7.5
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	24

BHA.:

BHA WEIGHT :	lbs	STRING WT.:	lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ../2

908215 061

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	24-Apr-99
REPORT No:	6
D.F.S:	3.0

WELL NAME: IONA # 5

STATUS @ 2400 HRS: Cement 13 3/8" casing

FROM	TO		24 HOUR SUMMARY
0:00	6:30	6.5	Drilled from 621 to 656m.
6:30	7:00	0.5	Circulated hole clean.
7:00	7:30	0.5	Run single shot wire line survey. Miss.run.
7:30	12:00	4.5	Wiper trip, clean & inspect BHA.
12:00	13:00	1	Pumped 40bbl hi vis Lcm sweep, circulated hole clean.
13:00	13:30	0.5	Run Gyro survey.
13:30	15:30	2	Pulled out , Laid out 171/2" stabilizers.
15:30	22:00	6.5	Rigged up & run 13 3/8" casing.to 656m.
22:00	23:00	1	Rigged up Halco cementing head, circulated casing volume x 2.
23:00	0:00	1	Loaded top plug pumnped 60 bbls preflush tested lines to 3000 psi,
			commenced to cement 13 3/8" casing.
			Incidents in last 24 Hours Y/N
			(If yes see separate report)
			- Weather : Cold

DOWNHOLE TOOLS		
Hours	Serial No.	Tool
46.5	55053132	NB STAB
46.5	5048	STR STAB
46.5	A228	STR STAB
152		Drlg Jars

FORMATION TOPS :

OPERATION TO 0600 HRS : Cemented 13 3/8" casing as per program, bumped plug to 2500 psi held 10 min, released press.WOC. From 02:00 hrs. 214 bbls of lead cement returns.

PROGRAM - NEXT 24 HRS : *Run & cement casing, WOC. Nipple up BOP.*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	2
SERVICE CO	11
TOTAL :	33

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	Westman/ Lambert

END OF REPORT

908215 062

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

TU AUSTRALIA — **WUGS** Western Underground Storage Project

DATE:	25-Apr-99
REPORT No:	7
D.F.S:	4.0
SHOE F.I.T:	

WELL NAME: IONA # 5 **STATUS @ 2400 HRS:** Wait on Bradenhead welding to cool of

DEPTH - 2400 HRS:	656 m	FORMATION:		KB - GL (m):	4.98
DEPTH - PREVIOUS:	m	HOLE SIZE:		SHOE DEPTH:	656
24 HR PROGRESS:	m	ACCIDENTS:	NIL	LAST CASING:	13 3/8"
SAFETY MEETINGS:	Running casing				

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	9.0	
VISCOSITY	48	
pH	8 . 1	
PV / YP	12 / 22	
GELS 0/10	8 / 16	
WL API / FC (cc)	8 . 4	
SOLIDS %	3 . 7	
SAND %	0 . 75	
CHLORIDES	23,000	
KCL (% WT)	14.00	
MBT (ppb)	11 . 5	
Pm Pm/Mf	.05 / .45	
TEMP (degC)		
HOLE VOL (bbls)	327	
SURFACE VOL (bbls)	490	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	G. Lange	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER	2	
DESANDER		
MUDCLEANER		
CENTRIFUGE		
SHAKER SCREENS:	3 x 84	3 x 84

INVENTORY	
BARITE	728 sx
GEL	84 sx
CEMENT	150 sx
SALT	sx
KCL	576 sx
DRILLWATER	bbl
DIESEL FUEL	16,737 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM		
PRESSURE		
GPM		
AV (DP - ft/min)		
AV (DC - ft/min)		
SPR		
SPR PRESS		

DRILLS / BOPS	
LAST BOP DRILL	
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	
NEXT BOP TEST	
DAYS SINCE LAST LTA	79

BIT DATA		
BIT No.		
SIZE (ins)		
TYPE		
IADC CODE		
SERIAL No.		
NOZZLES		
OUT (m)		
IN (m)		
DRILLED (m)		
HOURS		
CONDITION		
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		
645	¾°	S52E

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	
4. BIT TRIP	
5. WIPER TRIP	
6. SURVEY	
7. CIRC / COND	
8. CHANGE BHA	
9. CASE & CEMENT	2
10. WELLHEAD	16
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	6
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	24

BHA.:

BHA WEIGHT :	lbs	STRING WT.:	lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ../2

908215 063

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	25-Apr-99
REPORT No:	7
D.F.S:	4.0

WELL NAME: IONA # 5

STATUS @ 2400 HRS: Wait on Bradenhead welding to cool of. 4

FROM	TO		24 HOUR SUMMARY
00:00	2:00	2	Cemented 13 3/8" casing as per program, bumped plug with 2500 psi held for 10 minutes
			released pressure, no back flow.
2:00	8:00	6	W.O.C.
8:00	19:00	11	Rough cut casing, remove conductor & casing stump, final cut & dress casing.
			Install Braden head (A section) Pre heat and commence to weld.
19:00	0:00	5	A section wrapped in fiber glass blankets, wait to cool of prior to testing welds.

DOWNHOLE TOOLS		
Hours	Serial No.	Tool
152	1416-1128	Drlg Jars

Incidents in last 24 Hours Y/N

(If yes see separate report)

- Weather : Cold

FORMATION TOPS :

OPERATION TO 0600 HRS : Nipple up BOP.

PROGRAM - NEXT 24 HRS : *Nipple up & test BOP, make up 12 1/4" drill out assembly, drill.FIT, drill*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	2
SERVICE CO	11
TOTAL :	**33**

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	Westman/ Lambert

END OF REPORT

908215 064

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

BHP AUSTRALIA **WUGS** Western Underground Storage Project

DATE:	26-Apr-99
REPORT No:	8
D.F.S:	5.0
SHOE F.I.T:	

WELL NAME:	IONA # 5 ST #1	STATUS @ 2400 HRS:	Drilling cement
DEPTH - 2400 HRS:	656 m	FORMATION:	
DEPTH - PREVIOUS:	m	HOLE SIZE:	12 1/4"
24 HR PROGRESS:	m	ACCIDENTS:	NIL
SAFETY MEETINGS:	Running casing		

KB - GL (m):	4.98
SHOE DEPTH:	656
LAST CASING:	13 3/8"

DENSITY (ppg)	9.0	Bicarb x 7
VISCOSITY	45	Citric acide x 5
pH	10.0	
PV / YP	11 / 18	
GELS 0/10	7 / 15	
WL API / FC (cc)	8 . 8	
SOLIDS %	3 . 7	
SAND %	0.5	
CHLORIDES	22,000	
KCL (% WT)	14.00	
MBT (ppb)	11 . 5	
Pm Pm/Mf	.2 / 1.0	
TEMP (degC)	32	
HOLE VOL (bbls)	302	
SURFACE VOL (bbls)	490	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	G. Lange	

UNIT	GPM / HRS	UF / OF
DESILTER		
DESANDER		
MUDCLEANER		
CENTRIFUGE		
SHAKER SCREENS:	3 x 84	3 x 84

TYPE	PZ-8	PZ-8
STROKE	6"	6"
LINER	6"	6"
SPM	135	135
PRESSURE		1750
GPM	370	370
AV (DP - ft/min)	139	
AV (DC - ft/min)	204	
SPR		
SPR PRESS		

BARITE	726 sx
GEL	64 sx
CEMENT	150 sx
SALT	sx
KCL	578 sx
DRILLWATER	bbl
DIESEL FUEL	40,097 lts

LAST BOP DRILL	26-Apr-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	26-Apr-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	80

BIT No.	2	
SIZE (ins)	12 1/4"	
TYPE	STC	
IADC CODE	4-1-5 X	
SERIAL No.	LG3627	
NOZZLES	3X16, 1X12	
OUT (m)		
IN (m)	656	
DRILLED (m)		
HOURS		
CONDITION		
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

DEPTHS MD / (TVD)	Inc (deg)	Azimuth

TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

1. MOVE RIG	
2. RIG UP	
3. DRILLING	
4. BIT TRIP	3.5
5. WIPER TRIP	2
6. SURVEY	
7. CIRC / COND	0.5
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	2.5
11. BOP'S	14.5
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	0.5
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	0.5
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	24

BHA.: # 2	12 1/4"bit, 1 x 8" mudmotor, float sub, 1 x 12 9/16"stab, 1 x 8"DWD system, 1 x8" nmdc, 2 x XO subs, 22 x 5" HWDP. Drilling Jars,5 x 5" HWDP.		
BHA WEIGHT :	46,000 lbs	STRING WT.:	75,000 lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ./2

908215 065

DAILY

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	28-Apr-99
REPORT No:	8
D.F.S:	5.0

TRIAL AUSTRALIA | IONA # 5 ST # 1 | STATUS @ 2400 HRS: Drilling cement. 4

00:00	2:00	2	Waited on A section to cool down.
2:00	2:30	0.5	Pressure tested wellhead welds to 900 psi for 15 minutes.
2:30	10:30	8	Nippled up BOP, function tested.
10:30	17:00	6.5	Pressure tests BOP & surface equipment 250 psi low 5 minutes 2000 psi high 15 minutes as per program.
17:00	17:30	0.5	Ran wear bushing..
17:30	19:30	2	Laid out 8" drill collars.
19:30	23:00	3.5	Made up 12 1/4" BHA, surface tested motor & mwd, Run in to 625m, top of cement.
23:00	23:30	0.5	Drill out cement from 625 to 628m.
23:30	0:00	0.5	Circulate condition mud.
			Note from 19:30 hrs well name Iona # 5 ST # 1
			Incidents in last 24 Hours Y/N
			(If yes see separate report)
			- Weather : Cold & rain.

Hours	Serial No.	Tool
148.5	1418-1128	Drlg Jars

FORMATION TOPS :

OPERATION TO 0600 HRS : Drilled to 660m, ran FIT, EMW 10.9 ppg. Drilling ahead at 690m.

PROGRAM - NEXT 24 HRS : *Drill & slide Side Track # 1*

TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

CONTRACTOR	20
OPERATOR	2
SERVICE CO	14
TOTAL :	36

DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	Westmarv Lambert

END OF REPORT

908215 066

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

TU AUSTRALIA

WUGS Western Underground Storage Project

DATE:	27-Apr-99
REPORT No:	9
D.F.S:	6.0
SHOE F.I.T:	

WELL NAME: IONA # 5 ST # !

STATUS @ 2400 HRS: DRILLING

DEPTH - 2400 HRS:	928 m	FORMATION:		KB - GL (m):	4.98
DEPTH - PREVIOUS:	656 m	HOLE SIZE:	12 1/4"	SHOE DEPTH:	656
24 HR PROGRESS:	272 m	ACCIDENTS:	NIL	LAST CASING:	13 3/8"
SAFETY MEETINGS:	Housekeeping				

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	8.9	Gel x 10
VISCOSITY	47	Baracor x 3
pH	8 . 7	EZ-Mud x 4
PV / YP	13 / 26	Kwikseak M x 10
GELS 0/10	7 / 14	Pac-R x 15
WL API / FC (cc)	7 . 2	XCD x 8
SOLIDS %	3 . 2	Citric acid x 4
SAND %	1	Pot chlor x 3750kg
CHLORIDES	22,000	
KCL (% WT)	12 . 25	
MBT (ppb)	10	
Pm Pm/Mf	.08 / .65	
TEMP (degC)	46	
HOLE VOL (bbls)	427	
SURFACE VOL (bbls)	450	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	G. Lange	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER	24	
DESANDER		
MUDCLEANER		
CENTRIFUGE	24	
SHAKER SCREENS:	3 x 110	3 x 110

INVENTORY	
BARITE	728 sx
GEL	74 sx
CEMENT	150 sx
SALT	sx
KCL	576 sx
DRILLWATER	bbl
DIESEL FUEL	34,037 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM	135	135
PRESSURE		1750
GPM	370	370
AV (DP - ft/min)	139	
AV (DC - ft/min)	204	
SPR	40	60
SPR PRESS	160	225

DRILLS / BOPS	
LAST BOP DRILL	27-Apr-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	26-Apr-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	81

BIT DATA		
BIT No.	2	
SIZE (ins)	12 1/4"	
TYPE	STC	
IADC CODE	4-1-5 X	
SERIAL No.	LG3627	
NOZZLES	3X16, 1X12	
OUT (m)		
IN (m)	656	
DRILLED (m)	272	
HOURS	20	
CONDITION	IN	
AVG ROP (m/hr)	13 . 6	
WOB (x1000 lbs)	May-25	
RPM	200	
JET VEL (ft/sec)	282	
HHP @ BIT	274.00	

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	9 . 2

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	20
4. BIT TRIP	
5. WIPER TRIP	
6. SURVEY	
7. CIRC / COND	1
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	1
13. CORING	
14. LOGGING	
15. REAM / WASH	2
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	24

BHA.: # 2 — 12 1/4"bit, 1 x 8" mudmotor, float sub, 1 x 12 9/16"stab, 1 x 8"DWD system, 1 x8" nmdc, 2 x XO subs, 22 x 5" HWDP. Drilling Jars,5 x 5" HWDP.

BHA WEIGHT :	46,000 lbs	STRING WT.:	88,000 lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	90,000 lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	85,000 lbs

CONTINUED ../2

908215 067

DAIL b

DATE: 27-Apr-99

RIG : OD & E 30

REPORT No: 9

PERMIT : PPL-2 OTWAY BASIN

D.F.S: 6.0

WELL NAME: IONA # 5 ST # 1

STATUS @ 2400 HRS: Drilling 4

FROM	TO		24 HOUR SUMMARY
00:00	2:00	2	Drilled cement ,float collar, cement & shoe at 656m, drilled 4m new hole.
2:00	3:00	1	Circulated & conditioned mud.
3:00	4:00	1	Rigged up to run & run F.I.T. Rigged down. EMW 10 . 9 ppg.
4:00	0:00	20	Drill & slide from 660 to 928m. MWD survey at connections.

DOWNHOLE TOOLS		
Hours	Serial No.	Tool
166.5	1416-1128	Drlg Jars

Incidents in last 24 Hours Y/N

(If yes see separate report)

- Weather : Cold & rain.

FORMATION TOPS :

OPERATION TO 0600 HRS : 963m, pumped Lcm sweep, pumped pill, pull out to repair failed MWD tool.

PROGRAM - NEXT 24 HRS : *Drill & slide Side Track # 1*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	2
SERVICE CO	12
TOTAL :	34

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	Westman/ Lambert

END OF REPORT

908215 068

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	28-Apr-99
REPORT No:	10
D.F.S:	7.0
SHOE F.I.T:	10 . 9

WELL NAME: IONA # 5 ST # !

STATUS @ 2400 HRS: DRILLING

DEPTH - 2400 HRS:	1,116 m	FORMATION:	Claystone	KB - GL (m):	4.98
DEPTH - PREVIOUS:	928 m	HOLE SIZE:	12 1/4"	SHOE DEPTH:	656
24 HR PROGRESS:	188 m	ACCIDENTS:	NIL	LAST CASING:	13 3/8"

SAFETY MEETINGS: Working in wet condition

MUD PROPERTIES		ADDITIVES	
DENSITY (ppg)	9.1	Gel	x 30
VISCOSITY	63	Baracor	x 1
pH	9 . 2	EZ-Mud	x 4
PV / YP	20 / 37		
GELS 0/10	8 / 20	Pac-R	x 18
WL API / FC (cc)	6.0	XCD	x 2
SOLIDS %	4 . 3	Barite	x 35
SAND %	1 . 5	Pot chlor	x 3000kg
CHLORIDES	23,500	P0t hyd	x 4
KCL (% WT)	14 . 3	Sodaash	x 6
MBT (ppb)	10		
Pm Pm/Mf	.08 / .45		
TEMP (degC)	47		
HOLE VOL (bbls)	514		
SURFACE VOL (bbls)	440		
HOLE LOSSES (bbls)			
MUD CO	Baroid		
MUD ENGINEER	T. Aung		

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER	24	
DESANDER		
MUDCLEANER		
CENTRIFUGE	24	
SHAKER SCREENS:	3 x 110	3 x 110

INVENTORY	
BARITE	693 sx
GEL	44 sx
CEMENT	150 sx
SALT	sx
KCL	576 sx
DRILLWATER	bbl
DIESEL FUEL	28,537 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM	135	135
PRESSURE		1800
GPM	370	370
AV (DP - ft/min)	139	
AV (DC - ft/min)	204	
SPR	40	60
SPR PRESS	180	250

DRILLS / BOPS	
LAST BOP DRILL	28-Apr-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	26-Apr-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	82

BIT DATA		
BIT No.	2	
SIZE (ins)	12 1/4"	
TYPE	STC	
IADC CODE	4-1-5 X	
SERIAL No.	LG3627	
NOZZLES	3X16, 1X12	
OUT (m)		
IN (m)	656	
DRILLED (m)	460	
HOURS	32	
CONDITION	IN	
AVG ROP (m/hr)	14 . 4	
WOB (x1000 lbs)	15 - 25	
RPM	110	
JET VEL (ft/sec)	282	
HHP @ BIT	274.00	

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	9 . 2

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	12
4. BIT TRIP	
5. WIPER TRIP	8
6. SURVEY	
7. CIRC / COND	1
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	2.5
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	0.5
TOTAL	24

BHA.: # 3 — 12 1/4"bit, 12 1/4" nb stab, 1 x 8"DWD system, 12 9/16" stab, 1 x8" nmdc, 2 x XO subs, 24 x 5" HWDP. Drilling Jars,5 x 5" HWDP.

BHA WEIGHT :	45,000 lbs	STRING WT.:	86,000 lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	90,000 lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	85,000 lbs

CONTINUED ../2

908215 069

DAIL b

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	28-Apr-99
REPORT No:	10
D.F.S:	7.0

TU AUSTRALIA

WELL NAME: IONA # 5 ST # 1

STATUS @ 2400 HRS: Drilling 4

FROM	TO		24 HOUR SUMMARY
00:00	2:30	2.5	Drilled from 928 to 963 m.
2:30	3:30	1	Pumped 30 bbl LCM sweep circulated hole clean
3:30	4:00	0.5	Pulled out to 637m.
4:00	4:30	0.5	Slipped 34 ft of drilling line.
4:30	8:30	4	Continued to pull out to repair MWD. Laid out mud motor, redressed MWD,
			surface tested.
8:30	12:00	3.5	Ran in to 847 m. Tight hole.
12:00	14:30	2.5	Ream from 847 to 963 m.
14:30	0:00	9.5	Drilled from 963 to 1116 m.

DOWNHOLE TOOLS		
Hours	Serial No.	Tool
32	5022	String Stab
9.5		NB. Stab
181	1416-1128	Drlg Jars

Incidents in last 24 Hours Y/N
(If yes see separate report)

- Weather : Cold & rain.

FORMATION TOPS :

OPERATION TO 0600 HRS : Drilling ahead at 1165 m.

PROGRAM - NEXT 24 HRS : *Drill & slide Side Track # 1*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	21
OPERATOR	2
SERVICE CO	11
TOTAL :	**34**

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	Westman/ Lambert

END OF REPORT

908215 070

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	29-Apr-99
REPORT No:	11
D.F.S:	8.0
SHOE F.I.T:	10 . 9

WELL NAME: IONA # 5 ST # !

STATUS @ 2400 HRS: Bit trip

DEPTH - 2400 HRS:	1,287 m	FORMATION:	Claystone	KB - GL (m):	4.98
DEPTH - PREVIOUS:	1,116 m	HOLE SIZE:	12 1/4"	SHOE DEPTH:	656
24 HR PROGRESS:	171 m	ACCIDENTS:	NIL	LAST CASING:	13 3/8"

SAFETY MEETINGS: Working in wet condition

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	9.0	
VISCOSITY	58	Baracor x 2
pH	9 . 4	EZ-Mud x 3
PV / YP	20 / 35	Kwikseal x 10
GELS 0/10	8 / 17	Pac-R x 10
WL API / FC (cc)	6.0	XCD x 10
SOLIDS %	3 . 7	Barite x 45
SAND %	1	Pot chlor x 1850kg
CHLORIDES	23,000	P0t hyd x 3
KCL (% WT)	14.00	Sodaash x 2
MBT (ppb)	9	
Pm Pm/Mf	.08 / .5	
TEMP (degC)	54	
HOLE VOL (bbls)	593	
SURFACE VOL (bbls)	406	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	T. Aung	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER	24	
DESANDER		
MUDCLEANER		
CENTRIFUGE	24	
SHAKER SCREENS:	3 x 110	3 x 110

INVENTORY	
BARITE	648 sx
GEL	44 sx
CEMENT	150 sx
SALT	sx
KCL	576 sx
DRILLWATER	bbl
DIESEL FUEL	22,537 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM	140	140
PRESSURE		2000
GPM	391	391
AV (DP - ft/min)	144	
AV (DC - ft/min)	228	
SPR	40	60
SPR PRESS	180	250

DRILLS / BOPS	
LAST BOP DRILL	29-Apr-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	26-Apr-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	83

BIT DATA		
BIT No.	2	
SIZE (ins)	12 1/4"	
TYPE	STC	
IADC CODE	4-1-5 X	
SERIAL No.	LG3627	
NOZZLES	3X16, 1X12	
OUT (m)	1,287	
IN (m)	656	
DRILLED (m)	631	
HOURS	51	
CONDITION	2 - E - 1/16"	
AVG ROP (m/hr)	12 . 4	
WOB (x1000 lbs)	15 - 25	
RPM	110	
JET VEL (ft/sec)	302	
HHP @ BIT	296.00	

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	9 . 2

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	19
4. BIT TRIP	3
5. WIPER TRIP	
6. SURVEY	
7. CIRC / COND	1
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	0.5
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	0.5
30. SLIP & CUT LINE	
TOTAL	**24**

BHA.: # 3 12 1/4"bit, 12 1/4" nb stab, 1 x 8"DWD system, 12 9/16" stab,
1 x8" nmdc, 2 x XO subs, 23 x 5" HWDP. Drilling Jars,6 x 5" HWDP.

BHA WEIGHT :	45,000 lbs	STRING WT.:	90,000 lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	200 to 240 amps	DRAG UP :	100,000 lbs
TORQUE OFF BTM :	60 amps	DRAG DOWN :	80,000 lbs

CONTINUED ../2

908215 071

DAIL b

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	29-Apr-99
REPORT No:	11
D.F.S:	8.0

WELL NAME: IONA # 5 ST # 1 **STATUS @ 2400 HRS:** Bit trip 4

FROM	TO		24 HOUR SUMMARY
00:00	10:00	10	Drilled from1116 to 1211 m.
10:00	10:30	0.5	Serviced Rig.
10:30	15:30	5	Drilled to1249 m.
15:30	16:00	0.5	Repairs to # 1 pump, changed out swabs while circulating with # 2 pump.
16:00	20:00	4	Drilled to 1287 m.
20:00	21:00	1	Pumped hi-vis LCM sweep circulated hole clean.
21:00	0:00	3	Pulled outfor bit change.

Incidents in last 24 Hours Y/N
(If yes see separate report)

- Weather : Cold.

DOWNHOLE TOOLS

Hours	Serial No.	Tool
51	5022	String Stab
28.5		NB. Stab
200	1416-1128	Drlg Jars

FORMATION TOPS : Skull Creek 1110 m.

OPERATION TO 0600 HRS : Drilling ahead at 1300

PROGRAM - NEXT 24 HRS : *Trip for PDC bit, drill ahead*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	21
OPERATOR	2
SERVICE CO	11
TOTAL :	**34**

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	Westman/ Lambert

END OF REPORT

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	30-Apr-99
REPORT No:	12
D.F.S:	9.0
SHOE F.I.T:	10 . 9

WELL NAME: IONA # 5 ST # !

STATUS @ 2400 HRS: Drilling

DEPTH - 2400 HRS:	1,577 m	FORMATION:	Claystone	KB - GL (m):	4.98
DEPTH - PREVIOUS:	1,287 m	HOLE SIZE:	12 1/4"	SHOE DEPTH:	656
24 HR PROGRESS:	290 m	ACCIDENTS:	NIL	LAST CASING:	13 3/8"
SAFETY MEETINGS:	Working in wet condition				

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	9.2	
VISCOSITY	63	Baracor x 2
pH	8 . 5	EZ-Mud x 4
PV / YP	20 / 32	Kwikseal x 10
GELS 0/10	8 / 20	Pac-R x 12
WL API / FC (cc)	5 . 5	XCD x 10
SOLIDS %	5 . 3	Wallnut F x 8
SAND %	0 . 6	
CHLORIDES	19,500	
KCL (% WT)	12 . 3	
MBT (ppb)	9	Baracarb x 138
Pm Pm/Mf	.04 / .4	Baracarb 100 x 138
TEMP (degC)	51	Baracide x 2
HOLE VOL (bbls)	726	
SURFACE VOL (bbls)	406	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	T. Aung	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER	24	
DESANDER		
MUDCLEANER		
CENTRIFUGE	24	
SHAKER SCREENS:	3 x 110	3 x 110

INVENTORY	
BARITE	648 sx
GEL	44 sx
CEMENT	150 sx
SALT	sx
	sx
DRILLWATER	bbl
DIESEL FUEL	36,500 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM	140	140
PRESSURE		1950
GPM	391	391
AV (DP - ft/min)	144	
AV (DC - ft/min)	228	
SPR	40	60
SPR PRESS	200	280

DRILLS / BOPS	
LAST BOP DRILL	30-Apr-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	26-Apr-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	84

BIT DATA		
BIT No.	3	
SIZE (ins)	12 1/4"	
TYPE	FM2565	
IADC CODE		
SERIAL No.	7970231	
NOZZLES	5 x 18	
OUT (m)	!N	
IN (m)	1,287	
DRILLED (m)	290	
HOURS	16.5	
CONDITION		
AVG ROP (m/hr)	17 . 6	
WOB (x1000 lbs)	5 - 10	
RPM	110	
JET VEL (ft/sec)	302	
HHP @ BIT	296.00	

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	9 . 2

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	16.5
4. BIT TRIP	4
5. WIPER TRIP	
6. SURVEY	
7. CIRC / COND	1
8. CHANGE BHA	1
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	1
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	0.5
30. SLIP & CUT LINE	
TOTAL	**24**

BHA.: # 3	12 1/4"bit, 12 1/4" nb stab, 1 x 8"DWD system, FS, 12 9/16" stab, 1 x8" nmdc, 2 x XO subs, 23 x 5" HWDP. Drilling Jars,6 x 5" HWDP.		
BHA WEIGHT :	45,000 lbs	STRING WT.:	94,000 lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	280 amps	DRAG UP :	110,000 lbs
TORQUE OFF BTM :	180 amps	DRAG DOWN :	90,000 lbs

CONTINUED ../2

908215 073

DAIL b

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	30-Apr-99
REPORT No:	12
D.F.S:	9.0

WELL NAME: TU AUSTRALIA | IONA # 5 ST # 1 | **STATUS @ 2400 HRS:** Drilling 4

FROM	TO		24 HOUR SUMMARY
00:00	0:30	0.5	Pulled out
0:30	2:30	2	Made changes to BHA & run in.
2:30	5:00	2.5	Ran in hole
5:00	7:30	2.5	Drilled from 1287 to 1345 m.
7:30	8:00	0.5	Rig service.
8:00	12:30	4.5	Drilled to 1468 m.
12:30	13:00	0.5	Circulated hole clean , reciprocated pipe, 25k drag.
13:00	14:00	1	Drilled to 1487 m.
14:00	14:30	0.5	Flow checked, circulated hole clean.
14:30	21:30	7	Drilled to 1570 m.
21:30	22:30	1	Repairs to mud pump # 1.
22:30	0:00	1.5	Drilled to 1577 m.

Incidents in last 24 Hours Y/N
(If yes see separate report)

- Weather : Cold.

DOWNHOLE TOOLS		
Hours	Serial No.	Tool
58	5022	String Stab
44.5		NB. Stab
216.5	1416-1128	Drlg Jars

FORMATION TOPS :

OPERATION TO 0600 HRS : Drilling at 1662

PROGRAM - NEXT 24 HRS : *Drill to TD, make wiper trip, pull out . Log with Schlumberger.*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	21
OPERATOR	2
SERVICE CO	11
TOTAL :	**34**

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	Westman/ Lambert

END OF REPORT

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	1-May-99
REPORT No:	13
D.F.S:	10.0
SHOE F.I.T:	10 . 9

WELL NAME: IONA # 5 ST # !

STATUS @ 2400 HRS: Pull out to log.

DEPTH - 2400 HRS:	1,720 m	FORMATION:		KB - GL (m):	4.98
DEPTH - PREVIOUS:	1,577 m	HOLE SIZE:	12 1/4"	SHOE DEPTH:	656
24 HR PROGRESS:	143 m	ACCIDENTS:	NIL	LAST CASING:	13 3/8"

SAFETY MEETINGS: Tripping..

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	9.3	
VISCOSITY	61	Baracor x 1
pH	8 . 9	EZ -MUD x 1
PV / YP	20 /35	Kwikseal x 28
GELS 0/10	9 / 23	Pac-R x 4
WL API / FC (cc)	5.0	XCD x 6
SOLIDS %	5 . 7	Barite x 125
SAND %	0 . 5	
CHLORIDES	19,000	XCD x 6
KCL (% WT)	11 . 5	
MBT (ppb)	10 . 5	Baracarb x 18
Pm Pm/Mf	. 05 / . 50	Baracarb 100 x 18
TEMP (degC)	55	Baracide x 1
HOLE VOL (bbls)	792	
SURFACE VOL (bbls)	326	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	T. Aung	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER	24	
DESANDER		
MUDCLEANER		
CENTRIFUGE	24	
SHAKER SCREENS:	3 x 110	3 x 110

INVENTORY	
BARITE	453 sx
GEL	44 sx
CEMENT	700 sx
SALT	sx
	sx
DRILLWATER	bbl
DIESEL FUEL	30,000 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM	140	140
PRESSURE		2000
GPM	391	391
AV (DP - ft/min)	144	
AV (DC - ft/min)	228	
SPR	40	60
SPR PRESS	200	280

DRILLS / BOPS	
LAST BOP DRILL	1-May-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	26-Apr-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	85

BIT DATA		
BIT No.	3	
SIZE (ins)	12 1/4"	
TYPE	FM2565	
IADC CODE		
SERIAL No.	7970231	
NOZZLES	5 x 18	
OUT (m)	1,720	
IN (m)	1,287	
DRILLED (m)	433	
HOURS	26.6	
CONDITION	IN	
AVG ROP (m/hr)	16.30	
WOB (x1000 lbs)	5 - 10	
RPM	110	
JET VEL (ft/sec)	302	
HHP @ BIT	296.00	

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	9 . 2

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	10
4. BIT TRIP	1.5
5. WIPER TRIP	5
6. SURVEY	0.5
7. CIRC / COND	6.5
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	0.5
30. SLIP & CUT LINE	
TOTAL	24

BHA.: # 3 12 1/4"bit, 12 1/4" nb stab, 1 x 8"DWD system, FS, 12 9/16" stab.
1 x8" nmdc, 2 x XO subs, 23 x 5" HWDP. Drilling Jars,6 x 5" HWDP.

BHA WEIGHT :	45,000 lbs	STRING WT.:	100,000 lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	280 amps	DRAG UP :	120,000 lbs
TORQUE OFF BTM :	180 amps	DRAG DOWN :	80,000 lbs

CONTINUED ../2

908215 075

DAIL b

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	1-May-99
REPORT No:	13
D.F.S:	10.0

TU AUSTRALIA

WELL NAME: IONA # 5 ST # 1 **STATUS @ 2400 HRS:** Pull out to log.

FROM	TO		24 HOUR SUMMARY
00:00	8:00	8	Drilled from1577 to 1687 m.
8:00	8:30	0.5	Serviced Rig.
8:30	10:30	2.5	Drilled to td at 1720 m.
10:30	12:00	1.5	Pumped Hi-vis, lcm pill, circulated hole clean.
12:00	13:00	1	Pulled out to1427 m, tight hole.
13:00	13:30	0.5	Circulated & worked tight spot at 1435 m.
13:30	14:00	0.5	Pulled out to 1350 m. Tight hole, Circulated through tight hole.
14:00	15:30	1.5	Pulled out to 1040 m. tihht hole.
15:30	17:00	1.5	Circulated & worked pipe through tight hole at 1018 m. Circulated 40 bbl hi-vis ,lcm pill.
17:00	18:00	1	Pulled into shoe.
18:00	19:30	1.5	Ran in to 1730 m.
19:30	22:00	2.5	Wash down to 1720 m, pumped 40 bbls Hi-vis, lcm pill, circulated hole clean.
22:00	22:30	0.5	Dropped Gyro survey & pumped to bottom.
22:30	0:00	1.5	Flow checked & pull out of hole to log.

Incidents in last 24 Hours Y/N
(If yes see separate report)

- Weather : Cold.

DOWNHOLE TOOLS		
Hours	Serial No.	Tool
68	5022	String Stab
55.5		NB. Stab
227	1416-1128	Drlg Jars

FORMATION TOPS :

OPERATION TO 0600 HRS : Pulled out of hole Rig up & Log with Schlumberger.

PROGRAM - NEXT 24 HRS : *Wiper trip, pull out , Log with Schlumberger.*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	21
OPERATOR	2
SERVICE CO	11
TOTAL :	34

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	Westman/ Lambert

END OF REPORT

908215 076

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	2-May-99
REPORT No:	14
D.F.S:	11.0
SHOE F.I.T:	10 . 9

WELL NAME: IONA # 5 ST # !

STATUS @ 2400 HRS: Logging

DEPTH - 2400 HRS:	1,720	m	FORMATION:			KB - GL (m):	4.98
DEPTH - PREVIOUS:		m	HOLE SIZE:	12 1/4"		SHOE DEPTH:	656
24 HR PROGRESS:		m	ACCIDENTS:	NIL		LAST CASING:	13 3/8"

SAFETY MEETINGS: Tripping..

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	9.3	Aquagel x 2
VISCOSITY	68	Baracide x 1
pH	8 . 9	Barafibre x 25
PV / YP	20 / 32	Kwikseal F x 12
GELS 0/10	9 / 23	Pac R x 5
WL API / FC (cc)	5 . 5	Pot hydrox x 3
SOLIDS %	5 . 7	
SAND %	0 . 5	
CHLORIDES	18,500	
KCL (% WT)	11 . 5	
MBT (ppb)	10	
Pm Pm/Mf	.05 / .45	
TEMP (degC)	50	
HOLE VOL (bbls)	792	
SURFACE VOL (bbls)	304	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	T. Aung	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER		
DESANDER		
MUDCLEANER		
CENTRIFUGE	23	
SHAKER SCREENS:	3 x 110	3 x 110

INVENTORY	
BARITE	453 sx
GEL	42 sx
CEMENT	700 sx
SALT	sx
	sx
DRILLWATER	bbl
DIESEL FUEL	25,000 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM	140	140
PRESSURE		1500
GPM	391	391
AV (DP - ft/min)	144	
AV (DC - ft/min)	228	
SPR	40	60
SPR PRESS	200	280

DRILLS / BOPS	
LAST BOP DRILL	2-May-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	26-Apr-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	86

BIT DATA		
BIT No.	3	RR # 2
SIZE (ins)	12 1/4"	12 1/4"
TYPE	FM2565	02m
IADC CODE	PDC	4-1-5X
SERIAL No.	7970231	LG3627
NOZZLES	5 x 18	out
OUT (m)	1,720	1,720
IN (m)		1,720
DRILLED (m)		
HOURS		
CONDITION	1-X- IN	
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	9 . 2

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	
4. BIT TRIP	
5. WIPER TRIP	11.5
6. SURVEY	
7. CIRC / COND	1.5
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	10
15. REAM / WASH	0.5
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	0.5
TOTAL	24

BHA.: # 4 12 1/4"bit, 12 1/4" nb stab, 1 x 8"DWD system, FS, 12 9/16" stab,
1 x8" nmdc, 2 x XO subs, 23 x 5" HWDP. Drilling Jars,6 x 5" HWDP.

BHA WEIGHT :	45,000 lbs	STRING WT.:	92,000 lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ../2

908215 077

DAIL b

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	2-May-99
REPORT No:	14
D.F.S:	11.0

WELL NAME: TU AUSTRALIA | IONA # 5 ST # 1 | **STATUS @ 2400 HRS:** Logging.

FROM	TO		24 HOUR SUMMARY
00:00	3:30	3.5	Pullout of hole., retrieve Gyro,
3:30	8:00	4.5	Rig up Schlumberger, log run # 1, Pex-Hals-Bhc. No go past 1500 m. Pull out rig down
8:00	10:00	2	Made up Bit , ran in to shoe.
10:00	10:30	0.5	Slipped 33' of Drilling line.
10:30	11:30	1	Ran in to 1465 m.
11:30	12:00	0.5	Reamed from 1465 to 1478 m.
12:00	13:00	1	Ran in to 1703 m, washed down fr 1484 to 1506 & fr 1513 to 1535 , fr 1703 to 1720, no fill.
13:00	14:30	1.5	Pumped 40 bbl hi-vis sweep, circulated hole clean.
14:30	18:30	4	Flow checked well, pulled out to log.
18:30	0:00	5.5	Rigged up Schlumberger, Run Pex- hals-Bhc. In 19:00 out 22:30 hrs, No go past 1480 m.
			Changed stand off, rerun log, in at 23:00 hrs.
			Hole took 7 bbls of mud while logging.
			Pipe strap 0. 13 m difference, no tally change.
			Incidents in last 24 Hours Y/N
			(If yes see separate report)
			- Weather : Cold.

DOWNHOLE TOOLS		
Hours	Serial No.	Tool
68	5022	String Stab
55.5		NB. Stab
227	1416-1128	Drlg Jars

FORMATION TOPS :

OPERATION TO 0600 HRS : Attempted to log, no go past 1500 m. pulled out logging tools. Prepare to log through drill pipe.

PROGRAM - NEXT 24 HRS : *Log with schlumberger.*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	2
SERVICE CO	13
TOTAL :	35

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	W.Westman / J. Lambert

END OF REPORT

908215 078

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	3-May-99
REPORT No:	15
D.F.S:	12.0
SHOE F.I.T:	10 . 9

WELL NAME: IONA # 5 ST # !

STATUS @ 2400 HRS: Pulling out Schlumberger loggong tools on DP.

DEPTH - 2400 HRS:	1,720 m	FORMATION:		KB - GL (m):	4.98
DEPTH - PREVIOUS:	m	HOLE SIZE:	12 1/4"	SHOE DEPTH:	656
24 HR PROGRESS:	m	ACCIDENTS:	NIL	LAST CASING:	13 3/8"
SAFETY MEETINGS:	Tripping..				

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	9.2+	Barite x 61
VISCOSITY	61	
pH	8 . 6	
PV / YP	15 / 23	
GELS 0/10	6 / 15	
WL API / FC (cc)	5 . 6	
SOLIDS %	5 . 4	
SAND %	0 . 5	
CHLORIDES	16,500	
KCL (% WT)	10 . 8	
MBT (ppb)	9	
Pm Pm/Mf	.05 / .5	
TEMP (degC)	27	
HOLE VOL (bbls)	797	
SURFACE VOL (bbls)	284	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	T. Aung	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER		
DESANDER		
MUDCLEANER		
CENTRIFUGE		
SHAKER SCREENS:	3 x 110	3 x 110

INVENTORY	
BARITE	872 sx
GEL	42 sx
CEMENT	700 sx
SALT	sx
	sx
DRILLWATER	bbl
DIESEL FUEL	25,000 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM		
PRESSURE		
GPM		
AV (DP - ft/min)		
AV (DC - ft/min)		
SPR	40	60
SPR PRESS	200	280

DRILLS / BOPS	
LAST BOP DRILL	2-May-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	26-Apr-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	87

BIT DATA		
BIT No.		RR # 2
SIZE (ins)		12 1/4"
TYPE		02m
IADC CODE		4-1-5X
SERIAL No.		LG3627
NOZZLES		out
OUT (m)		
IN (m)		1,720
DRILLED (m)		
HOURS		
CONDITION		
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	
4. BIT TRIP	
5. WIPER TRIP	
6. SURVEY	
7. CIRC / COND	
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	24
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	24

BHA.: # 4	12 1/4"bit, 12 1/4" nb stab, 1 x 8"DWD system, FS, 12 9/16" stab, 1 x8" nmdc, 2 x XO subs, 23 x 5" HWDP. Drilling Jars,6 x 5" HWDP.		
BHA WEIGHT :	45,000 lbs	STRING WT.:	92,000 lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ./2

908215 079

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	3-May-99
REPORT No:	15
D.F.S:	12.0

WELL NAME: IONA # 5 ST # 1 **STATUS @ 2400 HRS:** Pulling out Schlumberger logging tools on DP.

FROM	TO		24 HOUR SUMMARY
00:00	4:30	4.5	Made 3 attempts With varied Stand offs to get log Pex-Hals-Bhc past 1511 m, no success.
			2nd run held up at 1484m, 3rd at 1511m, 4 th at 1500m. Pulled out rigged down Schlm.
4:30	16:00	11.5	Rigged up Schlumberger to log With Drill string.
			Ran in ti 1389 m, filling pipe every 5 stands.
16:00	16:30	0.5	Made up side entry sub & Schlum line, pumped to bottom.
16:30	21:30	5	Run in to 1720m & pull out to 1389 m, logging with schlum.
21:30	24:00	2.5	Rig down schlum side entry sub & wire line, pulled out drill pipe to 78m.

Incidents in last 24 Hours Y/N
(If yes see separate report)

- Weather : Cold.

DOWNHOLE TOOLS

Hours	Serial No.	Tool
68	5022	String Stab
55.5		NB. Stab
227	1416-1128	Drlg Jars

FORMATION TOPS :

OPERATION TO 0600 HRS : Pull out, lay out logging tools, wiper trip in circulate.

PROGRAM - NEXT 24 HRS : *Wiper trip & run velocity survey with Schlumberger.*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	2
SERVICE CO	14
TOTAL :	**36**

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	W.Westman / J. Lambert

END OF REPORT

908215 080

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

TU AUSTRALIA

WUGS Western Underground Storage Project

DATE:	4-May-99
REPORT No:	16
D.F.S:	13.0
SHOE F.I.T:	10 . 9

WELL NAME: IONA # 5 ST # !

STATUS @ 2400 HRS: Circulate condition Mud, prepare 9 5/8" casing

DEPTH - 2400 HRS:	1,720 m	FORMATION:		KB - GL (m):	4.98
DEPTH - PREVIOUS:	m	HOLE SIZE:	12 1/4"	SHOE DEPTH:	656
24 HR PROGRESS:	m	ACCIDENTS:	NIL	LAST CASING:	13 3/8"

SAFETY MEETINGS: Handling Casing.

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	9 . 2	Barite x 122
VISCOSITY	54	Baracarb x 21
pH	8 . 5	Baracarb100x21
PV / YP	13 / 20	KCL x 25
GELS 0/10	7 / 23	Pac R 3
WL API / FC (cc)	6 . 2	XCD x 4
SOLIDS %	5 . 2	Pot chlor x 2
SAND %	0 . 5	Pot Hydr x 5
CHLORIDES	17,500	
KCL (% WT)	11 . 2	
MBT (ppb)	8	
Pm Pm/Mf	.04 / .6	
TEMP (degC)	47	
HOLE VOL (bbls)	792	
SURFACE VOL (bbls)	302	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	T. Aung	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER	2	
DESANDER		
MUDCLEANER		
CENTRIFUGE	10	
SHAKER SCREENS:	3 x 110	3 x 110

INVENTORY	
BARITE	850 sx
GEL	42 sx
CEMENT	1,800 sx
SALT	sx
	sx
DRILLWATER	bbl
DIESEL FUEL	21,000 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM	140	140
PRESSURE		1800
GPM	390	390
AV (DP - ft/min)	130	
AV (DC - ft/min)	230	
SPR	40	60
SPR PRESS	200	280

DRILLS / BOPS	
LAST BOP DRILL	4-May-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	26-Apr-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	88

BIT DATA		
BIT No.		RR # 2
SIZE (ins)		12 1/4"
TYPE		02m
IADC CODE		4-1-5X
SERIAL No.		LG3627
NOZZLES		out
OUT (m)		
IN (m)		1,720
DRILLED (m)		
HOURS		
CONDITION		
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	
4. BIT TRIP	
5. WIPER TRIP	10.5
6. SURVEY	
7. CIRC / COND	7
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	5.5
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	1
TOTAL	**24**

BHA.: # 4 — 12 1/4"bit, 12 1/4" nb stab, 1 x 8"DWD system, FS, 12 9/16" stab, 1 x8" nmdc, 2 x XO subs, 23 x 5" HWDP. Drilling Jars,6 x 5" HWDP.

BHA WEIGHT :	45,000 lbs	STRING WT.:	100,000 lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ../2

908215 081

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	4-May-99
REPORT No:	16
D.F.S:	13.0

WELL NAME: IONA # 5 ST # 1

STATUS @ 2400 HRS: Circulate condition Mub Prepare 9 5/8" casing.

FROM	TO		24 HOUR SUMMARY
00:00	0:30	0.5	Schlum pull logging tools to surface.
0:30	1:30	1	Laid out Schlum logging tools.
1:30	4:30	3	Ran in to 1720 m. with 12 1/4" bit.
4:30	6:30	2	Circulated hole clean conditioned mud.
6:30	10:00	3.5	Flow checked well, pulled out of hole.
10:00	14:00	4	Run velocity survey with Schlum, rigged down schlum.
14:00	16:00	2	Ran in to 625 m.
16:00	17:00	1	Slipped & cut Drilling line.
17:00	19:00	2	Ran in to 1703 m.
19:00	24:00	5	Wash to bottom at 1720 m. Circulate & condition mud. Prepare 9 5/8" casing.

Incidents in last 24 Hours Y/N
(If yes see separate report)

- Weather : Cold.

DOWNHOLE TOOLS		
Hours	Serial No.	Tool
68	5022	String Stab
55.5		NB. Stab
227	1416-1128	Drlg Jars

FORMATION TOPS :

OPERATION TO 0600 HRS : Pull to shoe. Circulate.

PROGRAM - NEXT 24 HRS : *Pull out of hole, run & cement 9 5/8" casing.*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	2
SERVICE CO	8
TOTAL :	**30**

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	W.Westman / J. Lambert

END OF REPORT

908215 082

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	5-May-99
REPORT No:	17
D.F.S:	14.0
SHOE F.I.T:	

WELL NAME: IONA # 5 ST # !

STATUS @ 2400 HRS: Cementing 9 5/8" casing

DEPTH - 2400 HRS:	1,720 m	FORMATION:		KB - GL (m):	4.98
DEPTH - PREVIOUS:	m	HOLE SIZE:		SHOE DEPTH:	1,720
24 HR PROGRESS:	m	ACCIDENTS:	NIL	LAST CASING:	9 5/8"

SAFETY MEETINGS: Running casing

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	9 . 3	
VISCOSITY	56	Baracide x 3
pH		Barite x 45
PV / YP		Pot Hydrox x 4
GELS 0/10		
WL API / FC (cc)		
SOLIDS %		
SAND %		
CHLORIDES		
KCL (% WT)		
MBT (ppb)		
Pm Pm/Mf		
TEMP (degC)		
HOLE VOL (bbls)		
SURFACE VOL (bbls)		
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	T. Aung	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER	3	
DESANDER		
MUDCLEANER		
CENTRIFUGE	3	
SHAKER SCREENS:	3 x 110	3 x 110

INVENTORY	
BARITE	705 sx
GEL	42 sx
CEMENT	1,800 sx
SALT	sx
	sx
DRILLWATER	bbl
DIESEL FUEL	18,000 lts

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM		
PRESSURE		
GPM		
AV (DP - ft/min)		
AV (DC - ft/min)		
SPR		
SPR PRESS		

DRILLS / BOPS	
LAST BOP DRILL	4-May-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	26-Apr-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	89

BIT DATA		
BIT No.		
SIZE (ins)		
TYPE		
IADC CODE		
SERIAL No.		
NOZZLES		
OUT (m)		
IN (m)		
DRILLED (m)		
HOURS		
CONDITION		
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	
4. BIT TRIP	
5. WIPER TRIP	4
6. SURVEY	
7. CIRC / COND	7.5
8. CHANGE BHA	
9. CASE & CEMENT	12
10. WELLHEAD	0.5
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	24

BHA.: # 4

BHA WEIGHT :	lbs	STRING WT.:	lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ../2

908215 083

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	5-May-99
REPORT No:	17
D.F.S:	14.0

WELL NAME: IONA # 5 ST # 1 **STATUS @ 2400 HRS:** Cementing 9 5/8" casing

FROM	TO		24 HOUR SUMMARY
00:00	3:30	3.5	Circulate prepare 9 5/8" casing
3:30	5:30	2	Pull out of hole to shoe.
5:30	7:00	1.5	Circulate at shoe, prepare 9 5/8" casing.
7:00	9:00	2	Pulled out of hole.
9:00	9:30	0.5	Pulled wear Bushing.
9:30	20:30	12	Rigged up & ran 9 5/8" casing to 1720 m,
20:30	23:00	2.5	Circulated hole clean, pumped 150 bbls of Biocide treated mud down hole.
23:00	24:00	1	Pressure tested HALCO cement ing lines to 3000 psi.Pumped 40 bbls of preflush,
			commence to cement 9 5/8" casing as per program.

DOWNHOLE TOOLS		
Hours	Serial No.	Tool

Incidents in last 24 Hours Y/N
(If yes see separate report)

- Weather : Cold.

FORMATION TOPS :

OPERATION TO 0600 HRS : Cemented 9 5/8" casing, set SS assembley, rig down BOP.

PROGRAM - NEXT 24 HRS : *Nipple down BOP, Insert B section , nipple up & pressure test BOP, cbl, gyro.*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	3
SERVICE CO	16
TOTAL :	39

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	W.Westman / J. Lambert

END OF REPORT

908215 084

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

TU AUSTRALIA — **WUGS** Western Underground Storage Project

DATE:	6-May-99
REPORT No:	18
D.F.S:	15.0
SHOE F.I.T:	

WELL NAME: IONA # 5 ST # !

STATUS @ 2400 HRS: Run in with scraper

DEPTH - 2400 HRS:	1,708 m	FORMATION:		KB - GL (m):	4.98
DEPTH - PREVIOUS:	m	HOLE SIZE:		SHOE DEPTH:	1,720
24 HR PROGRESS:	m	ACCIDENTS:	NIL	LAST CASING:	9 5/8"
SAFETY MEETINGS:	Running casing				

MUD PROPERTIES		ADDITIVES
DENSITY (ppg)	8.7	Coat2748, 2 dr
VISCOSITY	27	KCL x 251
pH		
PV / YP		
GELS 0/10		
WL API / FC (cc)		
SOLIDS %		
SAND %		
CHLORIDES	35,000	
KCL (% WT)		
MBT (ppb)		
Pm Pm/Mf		
TEMP (degC)		
HOLE VOL (bbls)		
SURFACE VOL (bbls)		
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	T. Aung	

SOLIDS CONTROL		
UNIT	GPM / HRS	UF / OF
DESILTER	2	
DESANDER		
MUDCLEANER		
CENTRIFUGE		
SHAKER SCREENS:	3 x 110	3 x 110

PUMPS	1	2
TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM		
PRESSURE		
GPM		
AV (DP - ft/min)		
AV (DC - ft/min)		
SPR		
SPR PRESS		

INVENTORY	
BARITE	705 sx
GEL	42 sx
CEMENT	650 sx
SALT	sx
	sx
DRILLWATER	bbl
DIESEL FUEL	15,000 lts

DRILLS / BOPS	
LAST BOP DRILL	4-May-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	6-May-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	90

BIT DATA		
BIT No.		
SIZE (ins)		
TYPE		
IADC CODE		
SERIAL No.		
NOZZLES		
OUT (m)		
IN (m)		
DRILLED (m)		
HOURS		
CONDITION		
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

SURVEYS		
DEPTHS	Inc (deg)	Azimuth
MD/ (TVD)		

FORMATION DATA	
TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

TIME ANALYSIS	
1. MOVE RIG	
2. RIG UP	
3. DRILLING	
4. BIT TRIP	
5. WIPER TRIP	3.5
6. SURVEY	
7. CIRC / COND	
8. CHANGE BHA	2
9. CASE & CEMENT	3
10. WELLHEAD	
11. BOP'S	8.5
12. L.O.T.	
13. CORING	
14. LOGGING	7
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19. SIDETRACK	
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	**24**

BHA.: # 4

BHA WEIGHT :	lbs	STRING WT.:	lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ../2

908215 085

TU AUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	6-May-99
REPORT No:	18
D.F.S:	15.0

WELL NAME: IONA # 5 ST # 1 **STATUS @ 2400 HRS:** Run in with scraper

FROM	TO		24 HOUR SUMMARY
00:00	2:30	2.5	Cemented 9 5/8" casing as per program (cementing report.)
2:30	3:00	0.5	Set casing slip & seal assembley with 200 k.
3:00	11:00	8	Nipple down BOP, r0ugh cut casing, removed space out spool, final cut casing,
			nipple up B section.. Commence to nipple up BOP.
11:00	12:00	1	Rig up Schlumberger to log while nippling up BOP.
12:00	18:00	6	While nippling up BOP LOG with Schlumberger
			Ran Gyro on Schlum line tool hung up at 1050 m.
			Ran CBL tool hung up at 950m.
			Ran Velocity survey, tool Failed.
			Pressure tested B section to 2000 psi.
18:00	18:30	0.5	Halco pressure tested casing against blind rams to 2500 psi.
18:30	20:30	2	Break & lay out 8" BHA.
20:30	24:00	3.5	Run in with Scraper, tagged at 1708 m.
			Incidents in last 24 Hours Y/N
			(If yes see separate report)
			- Weather : Cold.

DOWNHOLE TOOLS		
Hours	Serial No.	Tool

FORMATION TOPS :

OPERATION TO 0600 HRS : Pulling out laying out Drill Pipe.

PROGRAM - NEXT 24 HRS : *Log pressure test BOP, Run completion.*

TRANSPORTATION	
TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	12
CRANE	

PERSONNEL	
CONTRACTOR	20
OPERATOR	3
SERVICE CO	14
TOTAL :	**37**

PROGRAMME COSTS	
DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	W.Westman / J. Lambert

END OF REPORT

908215 086

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	7-May-99
REPORT No:	19
D.F.S:	16.0
SHOE F.I.T:	

WELL NAME:	IONA # 5 ST # 1	STATUS @ 2400 HRS:	Run Completion
DEPTH - 2400 HRS:	1,708 m	FORMATION:	
DEPTH - PREVIOUS:	m	HOLE SIZE:	
24 HR PROGRESS:	m	ACCIDENTS:	NIL
SAFETY MEETINGS:	Running casing		

KB - GL (m):	4.98
SHOE DEPTH:	1,720
LAST CASING:	9 5/8"

DENSITY (ppg)	8.7	Defoam x 1
VISCOSITY	20	KCL x 45
pH		
PV / YP		
GELS 0/10		
WL API / FC (cc)		
SOLIDS %		
SAND %		
CHLORIDES	35,000	
KCL (% WT)		
T (ppb)		
Pm Pm/Mf		
TEMP (degC)		
HOLE VOL (bbls)	413	
SURFACE VOL (bbls)	95	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	T. Aung	

UNIT	GPM / HRS	UF / OF
DESILTER		
DESANDER		
MUDCLEANER		
CENTRIFUGE		
SHALER SCREENS	3 x 110	3 x 110

BARITE	705 sx
GEL	42 sx
CEMENT	650 sx
SALT	sx
	sx
DRILLWATER	bbl
DIESEL FUEL	13,000 lts

TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM		
PRESSURE		
GPM		
AV (DP - ft/min)		
AV (DC - ft/min)		
SPR		
SPR PRESS		

LAST BOP DRILL	4-May-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	6-May-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	90

BIT No.		
SIZE (ins)		
TYPE		
IADC CODE		
SERIAL No.		
NOZZLES		
OUT (m)		
IN (m)		
DRILLED (m)		
HOURS		
CONDITION		
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

DEPTHS MD / (TVD)	Inc (deg)	Azimuth

TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

1. MOVE RIG	
2. RIG UP	
3. DRILLING	
4. BIT TRIP	
5. WIPER TRIP	6.5
6. SURVEY	
7. CIRC / COND	1
8. CHANGE BHA	2
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	13
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19 COMPLETION	1.5
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	24

BHA.: # 4

BHA WEIGHT :	lbs	STRING WT.:	lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ../2

908215 087

TUAUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	7-May-99
REPORT No:	19
D.F.S:	16.0

IONA # 5 ST # 1 STATUS @ 2400 HRS: Run Completion

00:00	1:00	1	Circulated well to Brine.
1:00	7:30	6.5	Laid out drill pipe, break Kelly, continued to lay out dp.
7:30	9:30	2	Laid out Kelly, Break & laid out 8" bha.
9:30	22:30	13	Rigged up Schlumberger & log
			Run # 1 S-A-T in 9:40 out 14:05
			Run # 2 Gyro in 14:35 out 16:42. Tool failed. Rerun Gyro in 17:10 out 18:30. All ok.
			Run # 3 CBL in 19:24 out 21:52. Rigged down Schlumberger.
22:30	23:30	1	Handle completion equipment, picked up 2 joints 7" broke out Collars, laid out 2 joints 7".
23:30	24:00	0.5	Picked up guns & commenced to run completion.

	Hours	Serial No.	Tool
Incidents in last 24 Hours Y/N			
(If yes see separate report)			
- Weather : Cold.			

FORMATION TOPS :

OPERATION TO 0600 HRS : Running completion.

PROGRAM - NEXT 24 HRS : *Run completion, flare for clean up.*

TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	
CRANE	

CONTRACTOR	20
OPERATOR	3
SERVICE CO	14
TOTAL :	37

DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	W.Westman / J. Lambert

END OF REPORT

908215 088

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	8-May-99
REPORT No:	20
D.F.S:	17.0
SHOE F.I.T:	

WELL NAME:	IONA # 5 ST # 1	STATUS @ 2400 HRS:	Set packer
DEPTH - 2400 HRS:	1,708 m	FORMATION:	
DEPTH - PREVIOUS:	m	HOLE SIZE:	
24 HR PROGRESS:	m	ACCIDENTS:	NIL
SAFETY MEETINGS:	Running casing		

KB - GL (m):	4.98
SHOE DEPTH:	1,720
LAST CASING:	9 5/8"

DENSITY (ppg)	8.7	
VISCOSITY	20	KCL x 99 sx
pH		
PV / YP		
GELS 0/10		
WL API / FC (cc)		
SOLIDS %		
SAND %		
CHLORIDES	35,000	
KCL (% WT)		
MBT (ppb)		
Pm Pm/Mf		
TEMP (degC)		
HOLE VOL (bbls)	413	
SURFACE VOL (bbls)	95	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	T. Aung	

UNIT	GPM / HRS	UF / OF
DESILTER		
DESANDER		
MUDCLEANER		
CENTRIFUGE		
SHAKER SCREENS	3 x 110	3 x 110

BARITE	705 sx
GEL	42 sx
CEMENT	650 sx
SALT	sx
	sx
DRILLWATER	bbl
DIESEL FUEL	11,000 lts

	PZ-8	PZ-8
TYPE		
STROKE	8"	8"
LINER	6"	6"
SPM		
PRESSURE		
GPM		
AV (DP - ft/min)		
AV (DC - ft/min)		
SPR		
SPR PRESS		

LAST BOP DRILL	4-May-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	6-May-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	91

BIT No.		
SIZE (ins)		
TYPE		
IADC CODE		
SERIAL No.		
NOZZLES		
OUT (m)		
IN (m)		
DRILLED (m)		
HOURS		
CONDITION		
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

DEPTHS	Inc (deg)	Azimuth
MD / (TVD)		

TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

1. MOVE RIG	
2. RIG UP	
3. DRILLING	
4. BIT TRIP	
5. WIPER TRIP	
6. SURVEY	
7. CIRC / COND	
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19 COMPLETION	24
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	24

BHA.: # 4

BHA WEIGHT :	lbs	STRING WT.:	lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ../2

908215 089

TUAUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

IONA # 5 ST # 1

STATUS @ 2400 HRS: Set packer

DATE:	8-May-99
REPORT No:	20
D.F.S:	17.0

00:00	3:00	3	Made up guns & completion assembly, strap in hole.
3:00	5:00	2	Changed out damaged nipple directly below packer.
5:00	6:00	1	Continued to make up completion assembly & strap in hole.
6:00	8:00	2	Rigged up to run 7" completion string, prepare 7" casing.
8:00	15:00	7	Ran 7" completion string.
15:00	16:00	1	Correlate depths with Schlumberger.
16:00	18:00	2	Continued to run 7" completion string.
18:00	20:00	2	Correlate depths with Schlumberger.
20:00	20:30	0.5	Space out , made up pup, hanger & landing joint.
20:30	24:00	3.5	Rigged up wire line unit, lubricator & all associated equipment. Ran in & set plug.
			Pressure tested surface equipment to 3000 psi. Set packer with 2700 psi at 1545 m.

	Hours	Serial No.	Tool
Incidents in last 24 Hours Y/N			
(If yes see separate report)			
- Weather : Cold.			

FORMATION TOPS :

OPERATION TO 0600 HRS : Pressure tested, packer, annuls, flowhead,coflex hoses,choke manifold & flare lines. prepare to open sliding sleeve to pump nitrogen.

PROGRAM - NEXT 24 HRS : *Run completion, flare for clean up, rig down suspend well.*

TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	
CRANE	

CONTRACTOR	20
OPERATOR	3
SERVICE CO	13
TOTAL :	36

DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	W.Westman / J. Lambert

END OF REPORT

908215 090

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

WUGS Western Underground Storage Project

DATE:	9-May-99
REPORT No:	21
D.F.S:	18.0
SHOE F.I.T:	

WELL NAME:	IONA # 5 ST #1	STATUS @ 2400 HRS:	Rig released
DEPTH - 2400 HRS:	1,708 m	FORMATION:	
DEPTH - PREVIOUS:	m	HOLE SIZE:	
24 HR PROGRESS:	m	ACCIDENTS:	NIL
SAFETY MEETINGS:	Running casing		

KB - GL (m):	4.98
SHOE DEPTH:	1,720
LAST CASING:	9 5/8" 7"

DENSITY (ppg)	8.6	
VISCOSITY	20	Coat-2784, 1 dr
pH		
PV / YP		
GELS 0/10		
WL API / FC (cc)		
SOLIDS %		
SAND %		
CHLORIDES	35,000	
KCL (% WT)		
LGT (ppb)		
Pm Pm/Mf		
TEMP (degC)		
HOLE VOL (bbls)	413	
SURFACE VOL (bbls)	95	
HOLE LOSSES (bbls)		
MUD CO	Baroid	
MUD ENGINEER	T. Aung	

UNIT	GPM / HRS	UF / OF
DESILTER		
DESANDER		
MUDCLEANER		
CENTRIFUGE		
SHAKER SCREENS:	3 x 110	3 x 110

BARITE	705 sx
GEL	sx
CEMENT	650 sx
SALT	sx
	sx
DRILLWATER	bbl
DIESEL FUEL	9,000 lts

TYPE	PZ-8	PZ-8
STROKE	8"	8"
LINER	6"	6"
SPM		
PRESSURE		
GPM		
AV (DP - ft/min)		
AV (DC - ft/min)		
SPR		
SPR PRESS		

LAST BOP DRILL	4-May-99
LAST FIRE DRILL	
LAST ABN.RIG DRILL	
LAST BOP TEST	6-May-99
NEXT BOP TEST	
DAYS SINCE LAST LTA	92

BIT No.		
SIZE (ins)		
TYPE		
IADC CODE		
SERIAL No.		
NOZZLES		
OUT (m)		
IN (m)		
DRILLED (m)		
HOURS		
CONDITION		
AVG ROP (m/hr)		
WOB (x1000 lbs)		
RPM		
JET VEL (ft/sec)		
HHP @ BIT		

DEPTHS MD / (TVD)	Inc (deg)	Azimuth

TRIP GAS (%)	
CONN.GAS (%)	
B.GAS (%)	
P.PRESS (ppg)	
ECD (ppg)	

1. MOVE RIG	
2. RIG UP	
3. DRILLING	
4. BIT TRIP	
5. WIPER TRIP	
6. SURVEY	
7. CIRC / COND	
8. CHANGE BHA	
9. CASE & CEMENT	
10. WELLHEAD	
11. BOP'S	4
12. L.O.T.	
13. CORING	
14. LOGGING	
15. REAM / WASH	
16. FISH / STUCK	
17. LOSS CIRC	
18. KICK CONTROL	
19 COMPLETION	20
20. REP. SUBSURFACE	
21. REP. SURFACE	
22. WELL TEST	
23. W.O. WEATHER	
24. WAIT - OTHER WB.	
25. ABANDON / SUSP	
26. RIG DOWN	
27. W.O. CEMENT	
28. DRILL CEMENT	
29. RIG SERVICE	
30. SLIP & CUT LINE	
TOTAL	24

BHA.: # 4

BHA WEIGHT :	lbs	STRING WT.:	lbs
DP RATING :	lbs - 'G' Grade	MARGIN :	lbs @ 75%
DP RATING :	lbs - 'S' Grade	MARGIN :	lbs @ 75%
TORQUE ON BTM :	amps	DRAG UP :	lbs
TORQUE OFF BTM :	amps	DRAG DOWN :	lbs

CONTINUED ../2

908215 091

TUALUSTRALIA

DAILY DRILLING REPORT

RIG : OD & E 30

PERMIT : PPL-2 OTWAY BASIN

DATE:	9-May-99
REPORT No:	21
D.F.S:	18.0

IONA # 5 ST # 1 **STATUS @ 2400 HRS:** Rig released.

00:00	2:30	2.5	Laid out Lubricator, landed hanger, screwed in tie down studs, made up adaptor, picked & made up test flow head.Pressure tested flow head to plug to 2000 psi.
2:30	4:30	2	Rigged up lubricator, ran in retrieved plug, pressure tested annuls to 2000 psi, rigged up halco & coflex hoses to flowhead.
4:30	5:30	1	Pressure tested flare line to 1500psi, up stream choke to 2000 psi.
5:30	8:00	2.5	Ran in opened SSD
8:00	9:00	1	Displaced test string to annuls with nitrogen, returns 41.5 bbls brine.
9:00	10:30	1.5	Ran in , closed SSD, prepared for well test.
10:30	13:30	3	Held safety meeting, dropped bar at 10:45 hrs, flowed well as per program.
13:30	14:30	1	Ran in wire line , set plug.
14:30	15:00	0.5	Carry out in flow test.
15:00	15:30	0.5	Rigged down lubricator.
15:30	18:00	2.5	Killed well with brine 267bbls pumped.
18:00	20:00	2	Rigged down coflex hoses, flow head ect, backed out landing joint, installed BPV.
20:00	23:00	3	Nippled down BOP, cat walk, v/door.
23:00	24:00	1	Installed bonnet, pressure tested to 5000 psi 15 minutes. Cleaned mud tanks. Released Rig
			Final report this well.

	Hours	Serial No.	Tool
Incidents in last 24 Hours Y/N			
(If yes see separate report)			

- Weather : Cold.

FORMATION TOPS :

OPERATION TO 0600 HRS : Rigging down.

PROGRAM - NEXT 24 HRS : *Rig down Rig move*

TRANSPORT-1	
TRANSPORT-2	
TRANSPORT-3	
FORKLIFT	
WATER HAULER	
CRANE	

CONTRACTOR	20
OPERATOR	3
SERVICE CO	10
TOTAL :	33

DAILY Aus$:	
CUMULATIVE Aus$:	
REPORTED TO :	Colin Stuart
REPORTED BY :	W.Westman / J. Lambert

END OF REPORT

APPENDIX 2

Definitive Survey by Sperry Sun/Gyrodata

Sperry-Sun Drilling Services

Survey Report for Iona #5 ST1 : Definitive Gyro Survey

Definitive Survey Report

Western Underground Gas Storage Pty. Ltd.
Iona

Iona Drillpad

Measured Depth (m)	Incl.	Azim.	Sub-Sea Depth (m)	Vertical Depth (m)	Local Coordinates Northings (m)	Local Coordinates Eastings (m)	Global Coordinates Northings (m)	Global Coordinates Eastings (m)	Dogleg Rate (°/30m)	Vertical Section (m)	Comment
0.00	0.000	0.000	-134.98	0.00	0.00 N	75.00 W	5728374.14 N	677279.42 E		0.00	
30.00	0.520	181.510	-104.98	30.00	0.14 S	75.00 W	5728374.00 N	677279.42 E	0.520	0.02	
60.00	0.100	225.360	-74.98	60.00	0.29 S	75.03 W	5728373.85 N	677279.39 E	0.453	0.06	
90.00	0.280	113.130	-44.98	90.00	0.34 S	74.98 W	5728373.80 N	677279.44 E	0.331	0.02	
120.00	0.070	322.460	-14.98	120.00	0.35 S	74.92 W	5728373.79 N	677279.50 E	0.343	-0.04	
150.00	0.440	137.850	15.02	150.00	0.42 S	74.85 W	5728373.72 N	677279.57 E	0.510	-0.09	
180.00	0.280	61.120	45.02	180.00	0.47 S	74.71 W	5728373.67 N	677279.71 E	0.464	-0.23	
202.97	0.531	47.364	67.99	202.97	0.37 S	74.59 W	5728373.77 N	677279.83 E	0.349	-0.37	Narrawatruk Marl
210.00	0.610	45.450	75.02	210.00	0.33 S	74.54 W	5728373.81 N	677279.88 E	0.349	-0.42	
240.00	0.500	54.180	105.02	240.00	0.14 S	74.32 W	5728374.00 N	677280.10 E	0.138	-0.66	
270.00	0.310	48.400	135.02	270.00	0.01 S	74.15 W	5728374.13 N	677280.27 E	0.194	-0.84	
280.97	0.449	48.001	145.98	280.96	0.04 N	74.09 W	5728374.18 N	677280.33 E	0.380	-0.90	Mepunga
300.00	0.690	47.690	165.01	299.99	0.17 N	73.95 W	5728374.31 N	677280.47 E	0.380	-1.06	
330.00	0.540	42.880	195.01	329.99	0.39 N	73.72 W	5728374.53 N	677280.70 E	0.159	-1.31	
336.97	0.509	44.535	201.98	336.96	0.44 N	73.68 W	5728374.58 N	677280.74 E	0.149	-1.36	Dilwyn
360.00	0.410	51.760	225.01	359.99	0.56 N	73.54 W	5728374.70 N	677280.88 E	0.149	-1.51	
390.00	0.710	59.810	255.01	389.99	0.72 N	73.30 W	5728374.86 N	677281.12 E	0.309	-1.78	
420.00	0.580	61.770	285.01	419.99	0.89 N	73.00 W	5728375.03 N	677281.42 E	0.132	-2.09	
450.00	0.440	63.510	315.01	449.99	1.01 N	72.77 W	5728375.15 N	677281.65 E	0.141	-2.34	
480.00	0.710	73.260	345.01	479.99	1.12 N	72.49 W	5728375.26 N	677281.93 E	0.286	-2.63	
510.00	0.640	72.130	375.00	509.98	1.22 N	72.15 W	5728375.36 N	677282.27 E	0.071	-2.98	
540.00	0.480	71.900	405.00	539.98	1.31 N	71.87 W	5728375.45 N	677282.55 E	0.160	-3.27	
543.97	0.467	73.207	408.97	543.95	1.32 N	71.84 W	5728375.46 N	677282.58 E	0.127	-3.30	Pember Mudstone
570.00	0.390	83.820	435.00	569.98	1.36 N	71.65 W	5728375.50 N	677282.77 E	0.127	-3.49	
600.00	0.340	106.600	465.00	599.98	1.35 N	71.46 W	5728375.49 N	677282.96 E	0.152	-3.68	

Continued...

Sperry-Sun Drilling Services

Survey Report for Iona #5 ST1 : Definitive Gyro Survey

Definitive Survey Report

Western Underground Gas Storage Pty. Ltd.
Iona

Iona Drillpad

Measured Depth (m)	Incl.	Azim.	Sub-Sea Depth (m)	Vertical Depth (m)	Local Coordinates Northings (m)	Local Coordinates Eastings (m)	Global Coordinates Northings (m)	Global Coordinates Eastings (m)	Dogleg Rate (°/30m)	Vertical Section (m)	Comment
613 97	0 330	122 204	478.97	613.95	1.32 N	71.39 W	5728375.46 N	677283.03 E	0.196	-3.74	Pebble Point
630 00	0 350	139 650	495.00	629.98	1.25 N	71.32 W	5728375.39 N	677283.10 E	0.196	-3.81	
650 70	0 431	148 898	515.70	650.68	1.14 N	71.24 W	5728375.28 N	677283.18 E	0.148	-3.87	13 3/8" Casing
656 99	0 457	151.041	521.99	656.97	1.10 N	71.21 W	5728375.24 N	677283.21 E	0.148	-3.89	Paaratte
660 00	0 470	151 980	525.00	659.98	1.07 N	71.20 W	5728375.21 N	677283.22 E	0.148	-3.90	
690 00	0 320	218 540	555.00	689.98	0.90 N	71.19 W	5728375.04 N	677283.23 E	0.451	-3.89	
720 00	3 770	259 290	584.97	719.95	0.65 N	72.22 W	5728374.79 N	677282.20 E	3.534	-2.84	
750 00	8 200	269 370	614.80	749.78	0.45 N	75.33 W	5728374.59 N	677279.09 E	4.536	0.27	
780 00	13.700	269 280	644.25	779.23	0.38 N	81.02 W	5728374.52 N	677273.40 E	5.500	5.93	
810 00	20 000	269 800	672.94	807.92	0.31 N	89.71 W	5728374.45 N	677264.71 E	6.302	14.57	
840 00	23 920	265.630	700.76	835.74	0.17 S	100.91 W	5728373.97 N	677253.51 E	4.216	25.74	
870 00	30 970	260 540	727.37	862.35	1.90 S	114.61 W	5728372.24 N	677239.81 E	7.424	39.55	
900 00	37.120	261 210	752.22	887.20	4.56 S	131.19 W	5728369.58 N	677223.23 E	6.161	56.32	
930 00	43 790	261.480	775.04	910.02	7.48 S	150.42 W	5728366.66 N	677204.00 E	6.672	75.77	
960 00	50 510	260 310	795.43	930.41	10.97 S	172.12 W	5728363.17 N	677182.30 E	6.774	97.73	
990 00	51.220	260 800	814.36	949.34	14.79 S	195.08 W	5728359.35 N	677159.34 E	0.805	120.98	
1020 00	51.900	260.730	833.01	967.99	18.56 S	218.27 W	5728355.58 N	677136.15 E	0.682	144.46	
1050 00	52 450	260.910	851.41	986.39	22.34 S	241.66 W	5728351.80 N	677112.76 E	0.568	168.14	
1080 00	53 040	260.850	869.57	1004.55	26.13 S	265.24 W	5728348.01 N	677089.18 E	0.592	192.00	
1095 74	53 344	260.855	879.00	1013.98	28.13 S	277.68 W	5728346.01 N	677076.74 E	0.580	204.60	Skull Creek
1110 00	53 620	260.860	887.49	1022.47	29.95 S	289.00 W	5728344.19 N	677065.42 E	0.580	216.05	
1140 00	53 960	261.280	905.21	1040.19	33.71 S	312.91 W	5728340.43 N	677041.51 E	0.480	240.24	
1170 00	53 780	261.450	922.90	1057.88	37.35 S	336.86 W	5728336.79 N	677017.56 E	0.226	264.46	
1200 00	53 770	261.970	940.63	1075.61	40.83 S	360.81 W	5728333.31 N	676993.61 E	0.420	288.66	
1230 00	53 330	262 260	958.45	1093.43	44.15 S	384.71 W	5728329.99 N	676969.71 E	0.498	312.79	

Continued...

Sperry-Sun Drilling Services

Survey Report for Iona #5 ST1 : Definitive Gyro Survey

Definitive Survey Report

Western Underground Gas Storage Pty. Ltd.
Iona

Iona Drillpad

Measured Depth (m)	Incl.	Azim.	Sub-Sea Depth (m)	Vertical Depth (m)	Local Coordinates Northings (m)	Local Coordinates Eastings (m)	Global Coordinates Northings (m)	Global Coordinates Eastings (m)	Dogleg Rate (°/30m)	Vertical Section (m)	Comment
1260.00	53.020	262.530	976.43	1111.41	47.32 S	408.52 W	5728326.82 N	676945.90 E	0.378	336.80	
1290.00	53.060	262.590	994.47	1129.45	50.43 S	432.29 W	5728323.71 N	676922.13 E	0.062	360.77	
1320.00	53.650	262.700	1012.37	1147.35	53.51 S	456.16 W	5728320.63 N	676898.26 E	0.597	384.84	
1327.45	53.809	262.792	1016.78	1151.76	54.27 S	462.12 W	5728319.87 N	676892.30 E	0.706	390.84	Nullawarre
1350.00	54.290	263.070	1030.02	1165.00	56.51 S	480.23 W	5728317.63 N	676874.19 E	0.706	409.10	
1380.00	54.910	263.150	1047.40	1182.38	59.45 S	504.51 W	5728314.69 N	676849.91 E	0.623	433.55	
1410.00	55.530	264.280	1064.51	1199.49	62.14 S	529.00 W	5728312.00 N	676825.42 E	1.116	458.19	
1440.00	55.720	263.880	1081.45	1216.43	64.70 S	553.63 W	5728309.44 N	676800.79 E	0.381	482.95	
1470.00	56.360	264.600	1098.21	1233.19	67.19 S	578.39 W	5728306.95 N	676776.03 E	0.875	507.82	
1500.00	56.940	264.330	1114.70	1249.68	69.61 S	603.33 W	5728304.53 N	676751.09 E	0.622	532.88	
1510.61	57.156	264.440	1120.47	1255.45	70.48 S	612.19 W	5728303.66 N	676742.23 E	0.663	541.77	Belfast
1530.00	57.550	264.640	1130.93	1265.91	72.04 S	628.44 W	5728302.10 N	676725.98 E	0.663	558.10	
1560.00	57.860	264.070	1146.96	1281.94	74.53 S	653.68 W	5728299.61 N	676700.74 E	0.573	583.45	
1577.72	57.907	264.495	1156.38	1291.36	76.03 S	668.61 W	5728298.11 N	676685.81 E	0.615	598.45	Waarre D Unit
1590.00	57.940	264.790	1162.90	1297.88	77.00 S	678.97 W	5728297.14 N	676675.45 E	0.615	608.85	
1620.00	58.950	264.880	1178.60	1313.58	79.30 S	704.43 W	5728294.84 N	676649.99 E	1.013	634.41	
1629.78	59.188	265.021	1183.63	1318.61	80.04 S	712.79 W	5728294.10 N	676641.63 E	0.818	642.79	Waarre C1 Sand
1650.00	59.680	265.310	1193.91	1328.89	81.50 S	730.14 W	5728292.64 N	676624.28 E	0.818	660.19	
1650.83	59.690	265.321	1194.33	1329.31	81.56 S	730.85 W	5728292.58 N	676623.57 E	0.520	660.90	Waarre C2 Sand
1680.00	60.060	265.720	1208.97	1343.95	83.53 S	756.00 W	5728290.61 N	676598.42 E	0.520	686.11	
1700.00	60.380	265.280	1218.90	1353.88	84.89 S	773.31 W	5728289.25 N	676581.11 E	0.747	703.45	
1720.00	60.380	265.280	1228.79	1363.77	86.33 S	790.64 W	5728287.81 N	676563.78 E	0.000	720.82	Extrapolation to TD

Continued...

Western Underground Gas Storage Pty. Ltd.
Iona

Iona Drillpad

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 -12.205° (11-May-99)

The Dogleg Severity is in Degrees per 30m.
Vertical Section is from Iona #5 Wellhead and calculated along an Azimuth of 262.997° (Grid).

Based upon Minimum Curvature type calculations, at a Measured Depth of 1720.00m.,
The Bottom Hole Displacement is 720.83m., in the Direction of 263.122° (Grid).

Sperry-Sun Drilling Services

Survey Report for Iona #5 ST1 : Definitive Gyro Survey

Definitive Survey Report

Western Underground Gas Storage Pty. Ltd.
Iona

Iona Drillpad

Measured Depth (m)	Incl.	Azim.	Vertical Depth (m)	Local Coordinates Northings (m)	Local Coordinates Eastings (m)	Geographic Coordinates Latitude	Geographic Coordinates Longitude	Global Coordinates Northings (m)	Global Coordinates Eastings (m)
0.00	0.000	0.000	0.00	0.00 N	75.00 W	38.57529° S	143.03509° E	5728374.14 N	677279.42 E
30.00	0.520	181.510	30.00	0.14 S	75.00 W	38.57529° S	143.03509° E	5728374.00 N	677279.42 E
60.00	0.100	225.360	60.00	0.29 S	75.03 W	38.57529° S	143.03509° E	5728373.85 N	677279.39 E
90.00	0.280	113.130	90.00	0.34 S	74.98 W	38.57529° S	143.03509° E	5728373.80 N	677279.44 E
120.00	0.070	322.460	120.00	0.35 S	74.92 W	38.57529° S	143.03509° E	5728373.79 N	677279.50 E
150.00	0.440	137.850	150.00	0.42 S	74.85 W	38.57529° S	143.03509° E	5728373.72 N	677279.57 E
180.00	0.280	61.120	180.00	0.47 S	74.71 W	38.57529° S	143.03509° E	5728373.67 N	677279.71 E
210.00	0.610	45.450	210.00	0.33 S	74.54 W	38.57529° S	143.03509° E	5728373.81 N	677279.88 E
240.00	0.500	54.180	240.00	0.14 S	74.32 W	38.57529° S	143.03509° E	5728374.00 N	677280.10 E
270.00	0.310	48.400	270.00	0.01 S	74.15 W	38.57529° S	143.03510° E	5728374.13 N	677280.27 E
300.00	0.690	47.690	299.99	0.17 N	73.95 W	38.57528° S	143.03510° E	5728374.31 N	677280.47 E
330.00	0.540	42.880	329.99	0.39 N	73.72 W	38.57528° S	143.03510° E	5728374.53 N	677280.70 E
360.00	0.410	51.760	359.99	0.56 N	73.54 W	38.57528° S	143.03510° E	5728374.70 N	677280.88 E
390.00	0.710	59.810	389.99	0.72 N	73.30 W	38.57528° S	143.03511° E	5728374.86 N	677281.12 E
420.00	0.580	61.770	419.99	0.89 N	73.00 W	38.57528° S	143.03511° E	5728375.03 N	677281.42 E
450.00	0.440	63.510	449.99	1.01 N	72.77 W	38.57528° S	143.03511° E	5728375.15 N	677281.65 E
480.00	0.710	73.260	479.99	1.12 N	72.49 W	38.57528° S	143.03512° E	5728375.26 N	677281.93 E
510.00	0.640	72.130	509.98	1.22 N	72.15 W	38.57528° S	143.03512° E	5728375.36 N	677282.27 E
540.00	0.480	71.900	539.98	1.31 N	71.87 W	38.57527° S	143.03512° E	5728375.45 N	677282.55 E
570.00	0.390	83.820	569.98	1.36 N	71.65 W	38.57527° S	143.03513° E	5728375.50 N	677282.77 E
600.00	0.340	106.600	599.98	1.35 N	71.46 W	38.57527° S	143.03513° E	5728375.49 N	677282.96 E
630.00	0.350	139.650	629.98	1.25 N	71.32 W	38.57527° S	143.03513° E	5728375.39 N	677283.10 E
660.00	0.470	151.980	659.98	1.07 N	71.20 W	38.57528° S	143.03513° E	5728375.21 N	677283.22 E
690.00	0.320	218.540	689.98	0.90 N	71.19 W	38.57528° S	143.03513° E	5728375.04 N	677283.23 E
720.00	3.770	259.290	719.95	0.65 N	72.22 W	38.57528° S	143.03512° E	5728374.79 N	677282.20 E

Continued...

Sperry-Sun Drilling Services

Survey Report for Iona #5 ST1 : Definitive Gyro Survey

Definitive Survey Report

Western Underground Gas Storage Pty. Ltd.
Iona

Iona Drillpad

Measured Depth (m)	Incl.	Azim.	Vertical Depth (m)	Local Coordinates Northings (m)	Local Coordinates Eastings (m)	Geographic Coordinates Latitude	Geographic Coordinates Longitude	Global Coordinates Northings (m)	Global Coordinates Eastings (m)
750.00	8.200	269.370	749.78	0.45 N	75.33 W	38.57528° S	143.03508° E	5728374.59 N	677279.09 E
780.00	13.700	269.280	779.23	0.38 N	81.02 W	38.57528° S	143.03502° E	5728374.52 N	677273.40 E
810.00	20.000	269.800	807.92	0.31 N	89.71 W	38.57529° S	143.03492° E	5728374.45 N	677264.71 E
840.00	23.920	265.630	835.74	0.17 S	100.91 W	38.57529° S	143.03479° E	5728373.97 N	677253.51 E
870.00	30.970	260.540	862.35	1.90 S	114.61 W	38.57531° S	143.03463° E	5728372.24 N	677239.81 E
900.00	37.120	261.210	887.20	4.56 S	131.19 W	38.57534° S	143.03444° E	5728369.58 N	677223.23 E
930.00	43.790	261.480	910.02	7.48 S	150.42 W	38.57537° S	143.03422° E	5728366.66 N	677204.00 E
960.00	50.510	260.310	930.41	10.97 S	172.12 W	38.57540° S	143.03398° E	5728363.17 N	677182.30 E
990.00	51.220	260.800	949.34	14.79 S	195.08 W	38.57544° S	143.03371° E	5728359.35 N	677159.34 E
1020.00	51.900	260.730	967.99	18.56 S	218.27 W	38.57548° S	143.03345° E	5728355.58 N	677136.15 E
1050.00	52.450	260.910	986.39	22.34 S	241.66 W	38.57552° S	143.03318° E	5728351.80 N	677112.76 E
1080.00	53.040	260.850	1004.55	26.13 S	265.24 W	38.57556° S	143.03291° E	5728348.01 N	677089.18 E
1110.00	53.620	260.860	1022.47	29.95 S	289.00 W	38.57560° S	143.03264° E	5728344.19 N	677065.42 E
1140.00	53.960	261.280	1040.19	33.71 S	312.91 W	38.57564° S	143.03237° E	5728340.43 N	677041.51 E
1170.00	53.780	261.450	1057.88	37.35 S	336.86 W	38.57568° S	143.03209° E	5728336.79 N	677017.56 E
1200.00	53.770	261.970	1075.61	40.83 S	360.81 W	38.57571° S	143.03182° E	5728333.31 N	676993.61 E
1230.00	53.330	262.260	1093.43	44.15 S	384.71 W	38.57575° S	143.03154° E	5728329.99 N	676969.71 E
1260.00	53.020	262.530	1111.41	47.32 S	408.52 W	38.57578° S	143.03127° E	5728326.82 N	676945.90 E
1290.00	53.060	262.590	1129.45	50.43 S	432.29 W	38.57581° S	143.03100° E	5728323.71 N	676922.13 E
1320.00	53.650	262.700	1147.35	53.51 S	456.16 W	38.57584° S	143.03073° E	5728320.63 N	676898.26 E
1350.00	54.290	263.070	1165.00	56.51 S	480.23 W	38.57588° S	143.03045° E	5728317.63 N	676874.19 E
1380.00	54.910	263.150	1182.38	59.45 S	504.51 W	38.57591° S	143.03017° E	5728314.69 N	676849.91 E
1410.00	55.530	264.280	1199.49	62.14 S	529.00 W	38.57594° S	143.02989° E	5728312.00 N	676825.42 E
1440.00	55.720	263.880	1216.43	64.70 S	553.63 W	38.57596° S	143.02961° E	5728309.44 N	676800.79 E
1470.00	56.360	264.600	1233.19	67.19 S	578.39 W	38.57599° S	143.02933° E	5728306.95 N	676776.03 E

Continued...

Sperry-Sun Drilling Services

Survey Report for Iona #5 ST1 : Definitive Gyro Survey

Definitive Survey Report

Western Underground Gas Storage Pty. Ltd.
Iona

Iona Drillpad

Measured Depth (m)	Incl.	Azim.	Vertical Depth (m)	Local Coordinates Northings (m)	Local Coordinates Eastings (m)	Geographic Coordinates Latitude	Geographic Coordinates Longitude	Global Coordinates Northings (m)	Global Coordinates Eastings (m)
1500.00	56.940	264.330	1249.68	69.61 S	603.33 W	38.57602° S	143.02904° E	5728304.53 N	676751.09 E
1530.00	57.550	264.640	1265.91	72.04 S	628.44 W	38.57605° S	143.02876° E	5728302.10 N	676725.98 E
1560.00	57.860	264.070	1281.94	74.53 S	653.68 W	38.57607° S	143.02847° E	5728299.61 N	676700.74 E
1590.00	57.940	264.790	1297.88	77.00 S	678.97 W	38.57610° S	143.02818° E	5728297.14 N	676675.45 E
1620.00	58.950	264.880	1313.58	79.30 S	704.43 W	38.57613° S	143.02789° E	5728294.84 N	676649.99 E
1650.00	59.680	265.310	1328.89	81.50 S	730.14 W	38.57615° S	143.02759° E	5728292.64 N	676624.28 E
1680.00	60.060	265.720	1343.95	83.53 S	756.00 W	38.57617° S	143.02730° E	5728290.61 N	676598.42 E
1700.00	60.380	265.280	1353.88	84.89 S	773.31 W	38.57619° S	143.02710° E	5728289.25 N	676581.11 E
1720.00	60.380	265.280	1363.77	86.33 S	790.64 W	38.57621° S	143.02690° E	5728287.81 N	676563.78 E

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 -12.205° (11-May-99)

Based upon Minimum Curvature type calculations, at a Measured Depth of 1720.00m.,
The Bottom Hole Displacement is 720.83m., in the Direction of 263.122° (Grid).

Continued...

Western Underground Gas Storage Pty. Ltd.
Iona

Iona Drillpad

Comments

Measured Depth (m)	Station Coordinates TVD (m)	Northings (m)	Eastings (m)	Comment
1720.00	1363.77	86.33 S	790.64 W	Extrapolation to TD

Formation Tops

Measured Depth (m)	Vertical Depth (m)	Sub-Sea Depth (m)	Northings (m)	Eastings (m)	Formation Name
202.97	202.97	67.99	0.37 S	74.59 W	Narrawatruk Marl
280.97	280.96	145.98	0.04 N	74.09 W	Mepunga
336.97	336.96	201.98	0.44 N	73.68 W	Dilwyn
543.97	543.95	408.97	1.32 N	71.84 W	Pember Mudstone
613.97	613.95	478.97	1.32 N	71.39 W	Pebble Point
656.99	656.97	521.99	1.10 N	71.21 W	Paaratte
1095.74	1013.98	879.00	28.13 S	277.68 W	Skull Creek
1327.45	1151.76	1016.78	54.27 S	462.12 W	Nullawarre
1510.61	1255.45	1120.47	70.48 S	612.19 W	Belfast
1577.72	1291.36	1156.38	76.03 S	668.61 W	Waarre D Unit
1629.78	1318.61	1183.63	80.04 S	712.79 W	Waarre C1 Sand
1650.83	1329.31	1194.33	81.56 S	730.85 W	Waarre C2 Sand

Continued...

Western Underground Gas Storage Pty. Ltd.
Iona

Iona Drillpad

Casing details

From Measured Depth (m)	From Vertical Depth (m)	To Measured Depth (m)	To Vertical Depth (m)	Casing Detail
<Surface>	<Surface>	650.70	650.68	13 3/8" Casing

APPENDIX 3

Cuttings Descriptions

Depth (mRT)	Lithol. (%)	**Western Underground Gas Storage Pty Ltd** **Cuttings Description Sheet** **Well: Iona - 5** **Permit: PPL-2**
		17.5" Hole Section (550 – 656 mRT)
550	90	**CLAYSTONE:** medium to dark grey to brownish black in part, soft, dispersive, common to abundant quartz silt to fine sand, grading to arenaceous claystone in part, nil to trace carbonaceous specks, minor to common glauconite pellets oxidised and ferruginised in part, trace pyrite, trace to rare mica, trace skeletal fragments, slightly calcareous.
	10	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated, loose, predominantly medium to coarse grains, sub angular to sub rounded occasionally rounded and polished with ferruginous staining, moderate sphericity, moderate to well sorted quartz, trace to rare nodular pyrite, rare to minor skeletal fragments, good inferred porosity. No shows.
560	90	**CLAYSTONE:** as above
	10	**SANDSTONE:** as above
570	100	**CLAYSTONE:** as above
580	100	**CLAYSTONE:** as above
590	90	**CLAYSTONE:** as above.
600	100	**CLAYSTONE:** as above
	tr	**SANDSTONE:** as above
610	100	**CLAYSTONE:** as above
	tr	**SANDSTONE:** as above
613	70	**CLAYSTONE:** as above
	30	**SANDSTONE:** as above, occasional very coarse to granule subrounded and polished quartz
616	60	**CLAYSTONE:** as above
	40	**SANDSTONE:** as above
619	80	**SILTY CLAYSTONE GRADING TO ARENACEOUS CLAYSTONE:** medium to dark greenish grey to brownish grey , firm to moderately hard in part, abundant quartz silt to fine sand, nil to trace carbonaceous specks, minor to common glauconite pellets oxidised and ferruginised in part, trace to minor nodular pyrite, trace to rare mica flakes, trace skeletal fragments, slightly calcareous.
	20	**SANDSTONE:** as above, occasional very coarse, trace lithics
622	80	**SILTY CLAYSTONE:** as above

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		17.5" Hole Section (550 – 656 mRT)
	20	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated, loose, predominantly medium to coarse grains, sub angular to sub rounded occasionally rounded and polished with ferruginous staining, low to moderate sphericity, moderate to well sorted quartz, trace to rare nodular pyrite, good inferred porosity. No shows.
625	80	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated, loose, predominantly medium to coarse grains, sub angular to sub rounded occasionally rounded and polished with ferruginous staining, low to moderate sphericity, moderate to well sorted quartz, trace to rare nodular pyrite, good to excellent inferred porosity. No shows.
	20	**ARENACEOUS CLAYSTONE:** medium to dark greenish grey to brownish grey in part, firm to moderately hard, abundant quartz silt to fine sand, nil to trace carbonaceous specks, minor to common glauconite pellets oxidised and ferruginised in part, trace to minor nodular pyrite, trace to rare mica flakes, trace skeletal fragments, slightly calcareous.
628	70	**SANDSTONE:** as above.
	30	**ARENACEOUS CLAYSTONE:** as above
631	80	**SANDSTONE:** as above.
	10	**CLAYEY SANDSTONE:** as above
634	70	**ARENACEOUS CLAYSTONE:** as above
	30	**SANDSTONE:** as above.
637	60	**ARENACEOUS CLAYSTONE:** as above
	40	**SANDSTONE:** as above, grading to very coarse to granule.
640	70	**ARENACEOUS CLAYSTONE:** as above
	30	**SANDSTONE:** as above, grading to very coarse to granule.
643	80	**ARENACEOUS CLAYSTONE:** as above, minor very fine to coarse mica
	20	**SANDSTONE:** as above, grading to very coarse to granule.
646	70	**ARENACEOUS CLAYSTONE:** as above
	30	**SANDSTONE:** as above
649	60	**ARENACEOUS CLAYSTONE:** as above
	40	**SANDSTONE:** as above

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		17.5" Hole Section (550 – 656 mRT)
652	50	**ARENACEOUS CLAYSTONE:** as above, trace skeletal fragments
	50	**SANDSTONE:** as above
655	80	**ARENACEOUS CLAYSTONE:** as above
	20	**SANDSTONE:** as above
656 B.U. T.D.	20	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated, loose, predominantly medium to coarse grains, sub angular to sub rounded occasionally rounded and polished with ferruginous staining, low to moderate sphericity, moderate to well sorted quartz, trace to rare nodular pyrite, good to excellent inferred porosity. No shows.
	80	**ARENACEOUS CLAYSTONE:** medium to dark greenish grey to brownish grey in part, firm to moderately hard, abundant quartz silt to fine sand, nil to trace carbonaceous specks, minor to common glauconite pellets oxidised and ferruginised in part, trace to minor nodular pyrite, trace to rare mica flakes, trace skeletal fragments, slightly calcareous.

TD of 17.5" hole section 656mRT reached at 06:20 hrs 24 April, 1999

Depth (mRT)	Lithol. (%)	**Western Underground Gas Storage Pty Ltd** **Cuttings Description Sheet** **Well: Iona - 5** **Permit: PPL-2**
		12.5" Hole Section (656 – 1720 mRT)
659	90	**ARENACEOUS CLAYSTONE:** medium to dark greenish grey to brownish grey in part, firm to moderately hard, abundant quartz silt to fine sand, nil to trace carbonaceous specks, minor to common glauconite pellets oxidised and ferruginised in part, trace to minor nodular pyrite, trace to rare mica flakes, trace skeletal fragments, slightly calcareous.
	10	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated, loose, predominantly medium to coarse grains, sub angular to sub rounded occasionally rounded and polished with ferruginous staining, low to moderate sphericity, moderate to well sorted quartz, trace to rare nodular pyrite, good to excellent inferred porosity. No shows.
		Note: 30 percent cement contamination
662	90	**ARENACEOUS CLAYSTONE:** as above
	10	**SANDSTONE:** as above
		Note: 10 percent cement contamination
665	80	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated to friable, predominantly medium occasionally coarse grains, sub angular to sub rounded occasionally rounded, moderate sphericity, poorly to moderately sorted quartz, trace to rare multicoloured, orange, blue, hard lithic volcanic? and siliceous grains, trace to rare nodular pyrite, nil to trace calcareous, moderate to good inferred porosity. No fluorescence.
	20	**ARENACEOUS CLAYSTONE:** as above
668	70	**SANDSTONE:** as above
	30	**CLAYSTONE:** medium to light grey to brownish grey, very soft, dispersive, minor to common silt, minor very fine sand, minor pyritized coal specks, trace to rare mica
671	80	**SANDSTONE:** as above
	20	**CLAYSTONE:** as above
	tr	**COAL:** black, soft
674	90	**SANDSTONE:** as above
	10	**CLAYSTONE:** as above
	tr	**COAL:** black, soft
677	80	**SANDSTONE:** as above, 5 percent multicoloured volcanic lithics

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		12.5" Hole Section (656 – 1720 mRT)
	20 tr	**CLAYSTONE:** as above **COAL:** black, soft
680	90 10 tr	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated to friable, predominantly medium occasionally coarse grains, sub angular to sub rounded occasionally rounded, moderate sphericity, poorly to moderately sorted quartz, trace to rare multicoloured, orange, blue, hard lithic volcanic? and siliceous grains, trace to rare nodular and cement pyrite, trace to rare brown mica, nil to trace calcareous, moderate to good inferred porosity. No fluorescence. **CLAYSTONE:** medium to light grey to brownish grey, very soft, dispersive, minor to common silt, minor very fine sand, minor pyritized coal specks, trace to rare mica **COAL:** black, soft Note: change to 10 metre sample
690	100 tr	**SANDSTONE:** as above, grading to granule **CLAYSTONE:** as above
700	100	**SANDSTONE:** as above, grading to granule
710	90 10	**SANDSTONE:** as above, grading to granule **CLAYSTONE:** as above
720	100 tr	**SANDSTONE:** as above, grading to granule **CLAYSTONE:** as above
730	90 10	**SANDSTONE:** as above, grading to granule **CLAYSTONE:** as above
740	80 20 tr	**SANDSTONE:** as above **CLAYSTONE:** as above **COAL:** black, soft
750	80 20	**SANDSTONE:** as above, 10 percent multicoloured lithics **CLAYSTONE:** as above
760	90	**SANDSTONE:** as above, 10 percent multicoloured lithics

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		12.5" Hole Section (656 – 1720 mRT)
	10	**CLAYSTONE:** as above, grading to white in part with thin carbonaceous laminations
770	100	**SANDSTONE:** as above
780	80	**SANDSTONE:** as above
	20	**CLAYSTONE:** as above
790	90	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated to friable, predominantly medium to coarse grains, occasionally granule, sub angular to sub rounded occasionally rounded, moderate sphericity, poorly to moderately sorted quartz, trace to rare multicoloured, orange, blue, hard lithic volcanic? and siliceous grains, trace to rare nodular and cement pyrite, trace to rare brown mica, nil to trace calcareous, moderate to good inferred porosity. No fluorescence.
	10	**CLAYSTONE:** medium to light grey to brownish grey, very soft, dispersive, minor to common silt, minor very fine sand, minor pyritized coal specks, trace to rare mica
800	80	**SANDSTONE:** as above
	20	**CLAYSTONE:** as above
810	70	**SANDSTONE:** as above
	30	**CLAYSTONE:** as above
	tr	**COAL:** black, firm, pyritized
820	80	**SANDSTONE:** as above
	20	**CLAYSTONE:** as above
	tr	**COAL:** black, firm, pyritized
830	90	**SANDSTONE:** as above
	10	**CLAYSTONE:** as above
	tr	**COAL:** black, firm, pyritized
840	90	**SANDSTONE:** as above, occasional granule to pebble
	10	**CLAYSTONE:** as above
850	90	**SANDSTONE:** as above
	10	**CLAYSTONE:** as above

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		12.5" Hole Section (656 – 1720 mRT)
860	80	**SANDSTONE:** as above
	20	**CLAYSTONE:** as above
	tr	**COAL:** black, firm, pyritized
870	70	**SANDSTONE:** as above
	30	**CLAYSTONE:** as above
880	70	**SANDSTONE:** as above, rare to minor pyrite cement
	30	**CLAYSTONE:** as above
890	90	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated to friable, predominantly medium to coarse grains grading to granule, sub angular to sub rounded occasionally rounded, moderate sphericity, moderately to well sorted quartz, trace to rare multicoloured, orange, blue, hard lithic volcanic? and siliceous grains, trace to rare nodular and cement pyrite, trace to rare brown mica, nil to trace calcareous, excellent inferred porosity. No fluorescence.
	10	**CLAYSTONE:** medium to light grey to brownish grey, very soft, dispersive, minor to common silt, minor very fine sand, minor pyritized coal specks, trace to rare mica
	tr	**COAL:** black, firm, pyritized
900	100	**SANDSTONE:** as above
	tr	**CLAYSTONE:** as above
910	100	**SANDSTONE:** as above
	tr	**CLAYSTONE:** as above
920	100	**SANDSTONE:** as above
	tr	**CLAYSTONE:** as above
930	90	**SANDSTONE:** as above
	5	**CLAYSTONE:** as above
	5	**COAL:** as above
940	90	**SANDSTONE:** as above, predominantly medium
	5	**CLAYSTONE:** as above

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		12.5" Hole Section (656 – 1720 mRT)
	5	**COAL:** as above
950	100	**SANDSTONE:** as above
	tr	**CLAYSTONE:** as above
960	100	**SANDSTONE:** as above, grading to granule
970	90	**SANDSTONE:** as above, predominantly medium to coarse
	10	**CLAYSTONE:** as above
980	90	**SANDSTONE:** as above
	10	**CLAYSTONE:** as above
990	100	**SANDSTONE:** as above, minor white mica
	tr	**CLAYSTONE:** as above
1000	90	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated to friable, predominantly medium to coarse grains grading to granule, sub angular to sub rounded occasionally rounded, moderate sphericity, moderately to well sorted quartz, trace multicoloured, orange, blue, hard lithic volcanic? and siliceous grains, trace to rare nodular and cement pyrite, trace to rare brown mica, nil to trace calcareous, excellent inferred porosity. No fluorescence.
	10	**CLAYSTONE:** medium to light grey to brownish grey grading to white, very soft, dispersive, minor to common silt, minor very fine sand, minor pyritized coal specks, trace to rare mica
	tr	**COAL:** black, firm, pyritized
1010	80	**SANDSTONE:** as above, minor pyrite cement
	20	**CLAYSTONE:** as above
1020	90	**SANDSTONE:** as above, fine to granule, poorly to moderately sorted, common argillaceous
	10	**CLAYSTONE:** as above
1030	100	**SANDSTONE:** as above
	tr	**CLAYSTONE:** as above
1040	90	**SANDSTONE:** as above
	10	**CLAYSTONE:** as above

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		12.5" Hole Section (656 – 1720 mRT)
1050	70	**SANDSTONE:** as above
	30	**CLAYSTONE:** as above
1060	90	**SANDSTONE:** as above
	10	**CLAYSTONE:** as above
1070	90	**SANDSTONE:** as above
	10	**CLAYSTONE:** as above
1080	80	**SANDSTONE:** as above
	20	**CLAYSTONE:** as above
1090	80	**SANDSTONE:** as above, predominantly very coarse to granule, minor pyrite cement
	20	**CLAYSTONE:** as above
1110	80	**SANDSTONE:** as above, rare siliceous cement
	20	**CLAYSTONE:** as above
1120	70	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated to friable, predominantly medium to coarse grains grading to granule, sub angular to sub rounded occasionally rounded, moderate sphericity, moderately to well sorted quartz, trace multicoloured, orange, blue, hard lithic volcanic? and siliceous grains, trace to rare nodular and cement pyrite, trace to rare siliceous cement, trace to rare brown mica, nil to trace calcareous, excellent inferred porosity. No fluorescence.
	30	**CLAYSTONE:** medium to light grey to brownish grey grading to white, very soft, dispersive, minor to common silt, minor very fine sand, minor pyritized coal specks, trace to rare mica
	tr	**COAL:** black, firm, pyritized
1130	30	**SANDSTONE:** as above, rare to minor siliceous cement
	70	**CLAYSTONE:** medium to light grey to brownish grey, very soft, dispersive, minor to common silt, common to abundant very fine to fine sand grading to Sandy Claystone in part, minor pyritized coal specks, trace to rare mica flakes
1140	80	**CLAYSTONE:** as above
	20	**SANDSTONE:** as above

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		12.5" Hole Section (656 – 1720 mRT)
1150	80	**CLAYSTONE:** as above
	20	**SANDSTONE:** as above
1160	90	**CLAYSTONE:** as above
	10	**SANDSTONE:** as above
1170	70	**CLAYSTONE:** as above, trace glauconite
	25	**SANDSTONE:** as above
	5	**DOLOMITE:** yellowish brown to medium grey, hard, blocky, trace pyrite, trace carbonaceous, trace glauconite
1180	80	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated to friable, predominantly fine to medium, sub rounded to rounded, moderate sphericity, moderately to well sorted quartz, trace pyrite, trace glauconite, trace to rare white mica, excellent inferred porosity. No fluorescence.
	20	**CLAYSTONE:** as above
1190	50	**SANDSTONE:** as above
	50	**CLAYSTONE:** as above
	tr	**DOLOMITE:** as above
1200	90	**CLAYSTONE:** medium to light grey to brownish grey, very soft, dispersive, minor to common silt, common to abundant very fine to fine sand grading to Sandy Claystone in part, minor pyritized coal specks, trace to rare mica flakes, trace glauconite
	10	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated to friable, predominantly fine to medium, sub rounded to rounded, moderate sphericity, moderately to well sorted quartz, trace pyrite, trace to rare white mica, excellent inferred porosity. No fluorescence.
1210	90	**CLAYSTONE:** as above
	10	**SANDSTONE:** as above
1220	70	**CLAYSTONE:** as above, common (10 percent) pyrite
	20	**SANDSTONE:** as above
	10	**DOLOMITE:** as above
		Note: 10 to 20 percent cavings

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		12.5" Hole Section (656 – 1720 mRT)
1230	70	**CLAYSTONE:** as above, common (10 percent) pyrite, cavings as above
	20	**SANDSTONE:** as above
	10	**DOLOMITE:** as above
1240	60	**CLAYSTONE:** as above, common (10 percent) pyrite, cavings as above
	30	**SANDSTONE:** as above
	10	**DOLOMITE:** as above
1250	50	**CLAYSTONE:** as above, common (10 percent) pyrite, cavings as above
	50	**SANDSTONE:** as above
	tr	**DOLOMITE:** as above
1260	60	**CLAYSTONE:** as above, common (10 percent) pyrite, 20 to 30 percent cavings as above
	40	**SANDSTONE:** as above
1270	50	**CLAYSTONE:** as above, cavings as above
	50	**SANDSTONE:** as above, predominantly fine
1280	60	**CLAYSTONE:** as above, common (10 percent) pyrite, cavings as above
	40	**SANDSTONE:** as above
1287	10	**CLAYSTONE:** as above, common (10 percent) pyrite, cavings as above
B.U.	10	**SANDSTONE:** as above
	10	**DOLOMITE:** as above
1290	100	**CLAYSTONE:** medium to light grey to brownish grey, very soft, dispersive, minor to common silt, common to abundant very fine to fine sand grading to Sandy Claystone in part, minor pyritized coal specks, trace to rare mica flakes, trace glauconite
	tr	**SANDSTONE:** light grey to light brownish grey, clear to translucent grains, unconsolidated to friable, predominantly fine to medium, sub rounded to rounded, moderate sphericity, moderately to well sorted quartz, trace pyrite, trace to rare white mica, excellent inferred porosity. No fluorescence.
1300	100	**CLAYSTONE:** as above
	tr	**SANDSTONE:** as above,

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		12.5" Hole Section (656 – 1720 mRT)
1310	70	**CLAYSTONE:** as above
	30	**SANDSTONE:** light greenish grey to light brownish grey grading to white, clear to translucent grains, loose to friable to sub blocky in part, predominantly very fine to fine, sub angular to sub rounded, moderate sphericity, well sorted quartz, minor to common white argillaceous matrix, nil to trace calcareous cement, minor to common glauconite, trace to rare nodular pyrite cement, poor to moderate inferred porosity. No fluorescence.
1320	80	**SANDSTONE:** as above, abundant glauconite
	20	**CLAYSTONE:** as above
1330	90	**SANDSTONE:** as above, predominantly fine to medium, abundant glauconite
	10	**CLAYSTONE:** as above
1340	90	**SANDSTONE:** as above
	10	**CLAYSTONE:** as above
1350	90	**SANDSTONE:** as above, common white argillaceous matrix
	10	**CLAYSTONE:** as above
1360	100	**SANDSTONE:** as above
	tr	**CLAYSTONE:** as above
1370	100	**SANDSTONE:** as above
	tr	**CLAYSTONE:** as above
1380	100	**SANDSTONE:** as above
1390	100	**SANDSTONE:** as above
1400	100	**SANDSTONE:** as above, abundant white argillaceous matrix
1410	100	**SANDSTONE:** light greenish grey to light brownish grey grading to white, clear to translucent grains, loose to friable to sub blocky in part, predominantly very fine to fine, sub angular to sub rounded, moderate sphericity, well sorted quartz, common to abundant white argillaceous matrix, nil to trace calcareous cement, minor to common glauconite, trace to rare nodular pyrite cement, poor to moderate inferred porosity. No fluorescence.
1420	100	**SANDSTONE:** as above
1430	100	**SANDSTONE:** as above

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		12.5" Hole Section (656 – 1720 mRT)
		Note: common LCM material
1440	100	**SANDSTONE:** as above
1450	100	**SANDSTONE:** as above
1460	80	**SANDSTONE:** as above
	20	**CLAYSTONE:** medium to light grey to brownish grey, very soft, dispersive, minor to common silt, common to abundant very fine to fine sand grading to Sandy Claystone in part, minor pyritized coal specks, trace to rare mica flakes, trace glauconite
1470	80	**SANDSTONE:** as above
	20	**CLAYSTONE:** medium
1480	100	**SANDSTONE:** as above, 30 to40 percent glauconite nodules
1490	30	**SANDSTONE:** as above
	70	**CLAYSTONE:** dark grey to brownish grey, very soft, dispersive, minor to common silt, abundant (20 to 30 percent) glauconite
1500	30	**SANDSTONE:** as above
	70	**CLAYSTONE:** as above
1510	30	**SANDSTONE:** as above
	70	**CLAYSTONE:** as above
1520	30	**SANDSTONE:** as above with occ loose qtz grains, mg, sr-r, clear to frosted
	70	**CLAYSTONE:** as above
1530	20	**SANDSTONE:** as above with occ loose qtz grains, mg, sr-r, clear to frosted
	80	**CLAYSTONE:** as above
1540	30	**SANDSTONE:** as above with occasional loose quartz grains medium to coarse grained, sub rounded to rounded and pyrite aggregates
	70	**CLAYSTONE:** as above Note: spot sample at 1546m with slower drilling was 50-60% quartz sand loose, medium grained, sub rounded to rounded.
1550	30	**SANDSTONE:** as above with occasional loose quartz grains medium to coarse grained, sub rounded to rounded, clear to frosted

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		12.5" Hole Section (656 – 1720 mRT)
	70	**CLAYSTONE:** as above
1560	50 50	**SANDSTONE:** as above with occasional loose quartz grains medium to coarse grained, sub rounded to rounded, clear to frosted **CLAYSTONE:** as above
1570	80 20	**CLAYSTONE:** medium dark grey soft, dispersive with glauconite, dark green granular aggregates. **SANDSTONE:** white to light grey, medium grained, sub rounded to rounded, friable, glauconitic, occasional pyrite, with white argillaceous matrix.
1580	80 20	**CLAYSTONE:** medium dark grey soft, dispersive with glauconite, dark green granular aggregates. **SANDSTONE:** white to light grey, medium grained, sub rounded to rounded, friable, glauconitic, occasional pyrite, with white argillaceous matrix.
1584	50 50	**SANDSTONE:** quarttzose , sucrosic, occasional dark lithics, unconsolidated, white to medium grey, medium grained, very well sorted, sub rounded to rounded, clean with noticeable absence of glauconite. **CLAYSTONE:** medium dark grey soft, dispersive with glauconite, dark green granular aggregates.
1590	100	**SANDSTONE:** quarttzose , sucrosic, occasional dark lithics, unconsolidated, white to medium grey, medium grained, very well sorted, sub rounded to rounded, clean with noticeable absence of glauconite but first appearance of dark brown soft carbonaceous/lignitic material.
1595	100	**SANDSTONE:** as above
1600	100	**SANDSTONE:** as above
1605	100	**SANDSTONE:** as above
1610	100	**SANDSTONE:** as above
1615	100	**SANDSTONE:** as above
1620	100	**SANDSTONE:** as above with occasional pyrite aggregates
1625	100	**SANDSTONE:** as above with occasional pyrite aggregates
1630	100 Tr	**SANDSTONE:** as above with occasional pyrite aggregates **SILTSTONE:** medium to dark brown, soft, with carbonaceous laminae.

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		12.5" Hole Section (656 – 1720 mRT)
1635	100	**SANDSTONE:** as above with occasional pyrite aggregates
	Tr	**SILTSTONE:** medium to dark brown, soft, with carbonaceous laminae.
1640	90	**SANDSTONE:** as above with occasional pyrite aggregates
	10	**SILTSTONE:** medium to dark brown, soft, with carbonaceous laminae.
1645	100	**SANDSTONE:** quartzose, loose grains, m-cg, some well rounded very coarse grains, generally sub angular to rounded and well sorted, clear and frosted grains, with carbonaceous material , some dark conchoidally fractured coal and pyrite aggregates.
1650	100	**SANDSTONE:** as above
1655	100	**SANDSTONE:** as above
1660	100	**SANDSTONE:** as above
1665	50	**COAL:** black, shiny, soft conchoidally fractured grading in part to carbonaceous siltstone with thin coally laminae
	50	**SANDSTONE:** as above
1670	10	**COAL:** as above
	80	**SANDSTONE:** as above
	10	**SILTSTONE:** medium to dark brown with thin carbonaceous laminae
1675	80	**SANDSTONE:** as above
	10	**COAL:** as above
	10	**SILTSTONE:** medium to dark brown and greyish black with thin carbonaceous laminae
1680	50	**SILTSTONE:** medium to dark brown and greyish black with thin carbonaceous laminae
	50	**SANDSTONE:** as above
1685	50	**SANDSTONE:** as above
	50	**SILTSTONE:** medium to dark brown and greyish black with thin carbonaceous laminae

Depth (mRT)	Lithol. (%)	Western Underground Gas Storage Pty Ltd Cuttings Description Sheet Well: Iona - 5 Permit: PPL-2
		12.5" Hole Section (656 – 1720 mRT)
1690	40	**SANDSTONE:** as above
	60	**SILTSTONE:** medium to dark brown and greyish black with thin carbonaceous laminae
1695	70	**SANDSTONE:** as above
	30	**SILTSTONE:** as above
1700		Missed collecting sample
1705	80	**SANDSTONE:** as above with white calcareous cement in part
	20	**SILTSTONE:** medium brown, soft, carbonaceous
1710	80	**SANDSTONE:** as above
	20	**SILTSTONE:** as above
1715	90	**SANDSTONE:** as above
	10	**SILTSTONE:** as above
1720	95	**SANDSTONE:** as above
TD	5	**SILTSTONE:** as above

TD of 12.5" hole section 1720 mRT reached at 06:20 hrs 24 April, 1999

APPENDIX 4

Western Underground Gas Storage Iona-5 Report – Well Seismic Edit and Geogram. Schlumberger GeoQuest

Schlumberger

GeoQuest

WESTERN UNDERGROUND GAS STORAGE

IONA 5

REPORT

WELL SEISMIC EDIT

AND GEOGRAM

FIELD	:	IONA
COUNTRY	:	AUSTRALIA
	:	
	:	
LOCATION	:	VICTORIA
DATE OF VSP SURVEY	:	7-MAY-1999
REFERENCE NO.	:	561288

August 1999

IONA 5 Borehole Seismic

IONA 5 Borehole Seismic

List of Figures

List of Enclosures

Summary of Geophysical Listings

IONA 5 Borehole Seismic

Introduction

Checkshot data was acquired with the Seismic Acquisition Tool (SAT-A) in the IONA5 deviated onshore well on the 7th of MAY 1999. The IONA 5 well is operated by **WESTERN UNDERGROUND GAS STORAGE.** A SM4 was used as the downhole geophone and the air gun (200 cu. in) was used as the source.

Processing of the data consisted of loading the raw data, editing bad shots, picking transit times, stacking and then applying corrections to Seismic Reference Depth (SRD) which in this case is at Mean Sea Level (MSL), correcting for TVD.

CONVENTION.

In the plots, each processing step is displayed according to the *SEG normal* polarity convention (1976) whereby an upgoing compressional wave, reflected by an increase of acoustic impedance with depth, is displayed as a white trough.

Data Acquisition

Table 1. Survey Parameters

Elevation of KB	135.3 m above MSL
Elevation of DF	135 m above MSL
Elevation of GL	130 m above MSL
Level Interval	479.7-1202.3 VD MSL
Energy Source	Air gun
Source Offset	655.71 m
Source Depth	93.12 m above MSL
Reference Sensor	Reference hydrophone
Hydrophone Offset	655.71 m
Hydrophone Depth	93.62 m above MSL
Source & Hyd. Azimuth	263 Degrees
Tool Type	200 cu. in. air gun
Tool Combination	Stand Alone
Number of Axis	3
Geophone Type	SM-4
Sampling Rate	1.0 ms
Recording Time	3.0 s
Acquisition Unit	MAXIS 500
Recording Format	DLIS

WELL SEISMIC EDIT

Each shot of the raw geophone data was evaluated and edited as necessary.
The first 3 checkshot levels at 134, 297 and 338 mKB was excluded from processing due to poor signal in casing. Very low signal amplitude below 1581.5 mKB made it difficult to pick transit times.
The good shots at each level were stacked, using a median stacking technique, to increase the signal to noise ratio of the data. The transit time of each trace was re-computed after stacking. Stacked Z component is displayed in Plot 1.

Data Quality

The overall quality of the data is average.

Transit Time Measurement

The transit time measured, Delta t , corresponds to a difference between arrivals recorded by surface and downhole sensors. The reference time (zero time) is the physical recording of the source signal by accelerometers (fire pulse) on the gun or sensors positioned near the source (reference hydrophone and surface geophone). In this case, the reference hydrophone was used as the reference. First break picking algorithms were used on both the reference hydrophone and the downhole geophone.

Correction to Datum

Seismic Reference Datum (SRD) is at Mean Sea Level (MSL).

The source was positioned in the pit at 655.71 m, 263 degrees from the wellhead. elevation is 93.12 m above MSL. The surface velocity (1454 m/s), supplied by the client , used.

Geophysical Airgun Report

The Geophysical Airgun Report listing contains all downhole seismic measurements obtained by analyzing stacked shots.

The level number, corresponding KB and SRD depth, observed (non-vertical) transit times and corrected (vertical) transit times from the source and from SRD are listed. Also included are average velocities between SRD and geophone together with level separation and corresponding transit times and finally interval velocities between levels. Vertical transit times have been corrected for the effects of geometry. The interval velocities listed are those computed from corrected (i.e. vertical) transit times.

Sonic Calibration Processing

Sonic Calibration

The aim of the sonic calibration is to reconcile seismic (checkshot) times and integrated sonic times for any given depth in a well. In the presence of checkshot data with scatter, the calibration always adjusts the sonic integrated times to match smoothed checkshot times.

A *drift* curve is determined by comparing an integrated sonic log transit time and vertical check shot times. The term drift is defined as the seismic time (from check shots) minus the sonic time (from integration of edited sonic). Commonly the word drift is used to identify the difference between sonic and seismic measurements either between two or more levels or over different zones in a well.

For a negative drift, $\frac{\Delta Drift}{\Delta Depth} < 0$ the sonic time is greater than the seismic time over a certain section of the log.

For a positive drift, $\frac{\Delta Drift}{\Delta Depth} > 0$ the sonic time is less than the seismic time over a certain section of the log.

The drift curve, between two levels, is then an indication of the error on the integrated sonic or an indication of the amount of correction required on the sonic to have the TTI of the corrected sonic match the check shot times.

Two methods of correction to the sonic log are used.

1. Uniform or block shift. This method applies a uniform correction to all the sonic values over the interval. This uniform correction is applied in the case of positive drift and is the average correction represented by the drift curve gradient expressed in µsec/ft .

2. ΔT Minimum. In the case of negative drift a second method is used, called ΔT minimum. This applies a differential correction to the sonic log, where it is assumed that the greatest amount of transit time error is caused by the lower velocity sections of the log. Over a given interval the method will correct only Δt values which are higher than a threshold, the Δt_{min} . Values of Δt which are lower than the threshold are not corrected. The correction is a reduction of the excess of Δt over Δt_{min}, $\Delta t - \Delta t_{min}$.

$\Delta t - \Delta t_{min}$ is reduced through multiplication by a reduction coefficient which remains constant over the interval. This reduction coefficient, named G, can be defined as:

$$G = 1 + \frac{Drift}{\int (\Delta t - \Delta t_{min})dz}$$

Where *Drift* is the drift over the interval to be corrected and the value $\int (\Delta t - \Delta t_{min})dz$ is the time difference between the integrals of the two curves Δt and Δt_{min} only over the intervals where $\Delta t > \Delta t_{min}$.

Hence the corrected sonic: $\Delta t = G(\Delta t - \Delta t_{min}) + \Delta t_{min}$.

Open Hole Logs

The following table summarizes the availability of the sonic and density logs.

Log	Type	Interval
Sonic	Sonic data	655-1622 mKB
Density	Density data	655-1622 mKB

Both sonic and density have been depth matched to definitive ECGR.
Density log was edited extended to the SRD level using constant value of 2.29 g/cc.

DTCO curve was used as a sonic log. The last 300 m of the log were missing. This part of the sonic log was reconstructed using ELAN petrophysical software. Quality Control Recomputed Sonic plot is included. DT Field and DT Recomputed Curves overlay very well. Field and Recomputed curves were spliced at 1400 mKB.

The gamma ray, deep resistivity and caliper logs have been included as correlation curves where they were available.

All logs were corrected for TVD.

Sonic Calibration Output

Zone Set Data

This listing shows the depth of selected knees from KB and SRD together with the measured drift. The amount of sonic adjustment and the type of correction (block shift or Delta T Minimum) plus the corresponding reduction factor G if applicable are all printed out.

Sonic Adjustment Data

The Drift & Sonic Adjustment Report contains the basic comparison of raw seismic and edited sonic integrated times at checkshot levels.
The level number, measured depth and vertical depth for all levels, vertical checkshot times adjusted to SRD and corresponding integrated sonic times are compiled in the listing. The drift between two adjacent checkshot levels is listed in milliseconds and the corrections to be applied to the sonic log in μsec/ m are also listed for all intervals between two adjacent levels

Drift Corrected Sonic Plot

The effect of the shifts listed in the Drift & Sonic Adjustment Report on the edited sonic log and the results of sonic adjustment for drift are graphically displayed on the Drift Corrected Sonic (Plot 5).

Velocity Report

The Average, RMS and interval velocities between two adjacent checkshot levels computed from corrected (adjusted) sonic log are listed in the Velocity Report with the sampling rate 2 ms.

Velocity Crossplot

Three velocities - Average, Interval, and Root Mean Square together with Time vs. Depth curve are computed for all checkshot levels. The results are plotted as a function of depth on the Velocity Crossplot.

Interval velocities (v_{int}) are those computed between two adjacent checkshot levels from corrected sonic logs and listed in the Velocity Report. Interval velocity is defined as

$$v_{int} = z_n - z_{n-1} \text{ over } t_n - t_{n-1}$$

where z_n is the depth of nth layer and t_n its corresponding integrated sonic time.

Average velocities (v_{ave}) are computed by dividing SRD depth of checkshots and their corresponding integrated sonic times from corrected sonic log.

$$v_{ave} = \frac{\sum v_n t_n}{\sum t_n}$$

Root Mean Square Velocity (v_{rms}) is computed from calibrated sonic logs by

$$v_{rms} = \sqrt{\frac{\sum v_n^2 t_n}{\sum t_n}}$$

where v_n is an interval velocity over some specific time increment Delta t_n of calibrated sonic log.

The Time vs. Depth Curve is the result of integration of the calibrated sonic log and is plotted as two way time (TWT) against depth.

Time to Depth Report

This listing is obtained from the calibrated sonic log. The results are listed against two way time (TWT) together with corresponding seismic datum (SRD) depths. Sampling rate is 1 ms.

Sonic Calibration Results

Plot 4, Velocity Crosssplot is a display of the sonic calibration output in 34" format.

Top of the sonic log was chosen as the start of the drift computation.

The calculated drift was small and well defined exhibiting very little scatter. The drift curve as expected increases steadily to a cumulative value of 9.8 msec at TD.

Knees are selected from the raw drift curve and lithological boundaries marked by the well logs. The depths of the knees define the zones for the adjustment.
The selected drift at the knees, defines the amount of time adjustment to the sonic log in each zone.

Geogram Processing

Composite Display plots 2, 3 (Normal and Reversed Polarities correspondingly at scale 1 s : 25 cm) and 6 and 7 (normal and Reversed Polarities at scale 1s : 50 cm) were generated using 25, 30 and 35 Hz zero phase Ricker wavelets (the sonic log used to generate the Geograms was calibrated using first break transit-times).

GEOGRAM processing produces synthetic seismic traces based on reflection coefficients generated form sonic and density measurements in the well-bore. The steps in the processing chain are described below.

Depth to Time Conversion

Open hole logs are recorded from the bottom to top with a depth index. These data are converted to a two-way time index in order to match the seismic section.

Primary Reflection Coefficients

Sonic and density data are averaged over chosen time intervals (normally 2 or 4 milliseconds). Reflection coefficients are then computed using:

$$R = \frac{\rho_2 v_2 - \rho_1 v_1}{\rho_2 v_2 + \rho_1 v_1}$$

where:

ρ_1 = density of the layer above the reflection interface
ρ_2 = density of the layer below the reflection interface
v_1 = compressional wave velocity of the layer above the reflection interface
v_2 = compressional wave velocity of the layer below the reflection interface

This computation is done for each time interval to generate a set of primary reflection coefficients without transmission losses.

Primaries with Transmission Loss

Transmission loss on two-way attenuation coefficients is computed using:

$$A_n = (1 - R_1^2).(1 - R_2^2).(1 - R_3^2)...(1 - R_n^2)$$

A set of primary reflection coefficients with transmission loss is generated using:

$$Primary_n = R_n.A_{n-1}$$

Primaries plus Multiples

Multiples are computed from these input reflection coefficients using the transform technique from the top of the well to obtain the impulse response of the earth. The transform outputs primaries plus multiples.

Multiples Only

By subtracting previously calculated primaries form the above result we obtain multiples only.

Wavelet

A theoretical wavelet is chosen to use for convolution with the reflection coefficients previously generated. Choices available include:

Klauder wavelet
Ricker zero phase wavelet
Ricker minimum phase wavelet
Butterworth wavelet
User defined wavelet

Time variant Butterworth filtering can be applied after convolution.

Polarity Convention

Throughout this report the following polarity convention is used. An increase in acoustic impedance gives a positive reflection coefficient, is written to tape as a negative number and is displayed as a white trough under normal polarity. This is displayed in figure 1.

Convolution

The standard procedure of convolving the wavelet with reflection coefficients is performed; the output is the synthetic seismogram.

Geograms were generated with zero phase Ricker wavelets with central frequencies of 25 Hz, 30 Hz and 35 Hz. They are displayed in Plots 2, 3 and 6,7.

A Summary of Geophysical Listings

Four geophysical data listings are appended to this report. Following is a brief description of the format of each listing.

Well Seismic Report

1. Level number: the level number starting from the top level (includes any imposed shots).

2. Vertical depth form SRD: *dsrd*, the depth in metres from seismic reference datum.

3. Measured depth from KB: *dkb*, the depth in meters from kelly bushing.

4. Observed travel time HYD to GEO: *tim*0, the transit time picked form the stacked data by subtracting the surface sensor first break time from the downhole sensor first break time.

5. Vertical travel time SRD to GEO: *shtm*, is *timv* corrected for the vertical distance between source and datum.

6. Delta depth between shots: Δ*depth*, the vertical distance between each level.

7. Delta time between shots: Δ*time*, the difference in vertical travel time (*shtm*),between each level.

8. Interval velocity between shots: the average seismic velocity between each level, Δ*depth*/Δ*time*

9. Average velocity SRD to GEO: the average seismic velocity from datum to the corresponding checkshot level, $\frac{dsrd}{shtm}$.

Drift & Sonic Adjustment

Zone Set Data

1. Knee number: the knee number starting from the highest knee. (The first knees listed will generally be at SRD and the top of sonic. The drift imposed at these knees will normally be zero.)

2. Measured depth from KB: the depth in meters from kelly bushing

3. Vertical depth from SRD: the depth in meters from seismic reference datum.

4. Selected Drift at knee: the value of drift imposed at each knee.

5. Shift: the change in drift divided by the change in depth between any two levels.

6. Delta-T: see section 4 of report for an explanation of Δt_{min}.

7. Reduction factor G: see section 4 of report.

8. Selected Drift Gradient: the gradient of the imposed drift curve.

Sonic Adjustment Data

1. Measured depth from KB: the depth in meters from kelly bushing

2. Vertical depth from SRD: the depth in meters from seismic reference datum.

3. Vertical shot time SRD to GEO: the calculated vertical travel time from datum to downhole geophone.

4. Adjusted Sonic Time.

5. Computed drift at level: the checkshot time minus the integrated raw sonic time.

6. Residual Shot Time - Adjusted Sonic Time.

7. Adjusted Interval Velocity.

8. Adjusted RMS Velocity.

9. Adjusted Average Velocity.

Velocity Report

The data in this listing has been resampled in time.

1. Two way travel time from SRD: this is the index for the data in this listing. The first value is at SRD (0 millisecs) and the sampling rate is 2 millisecs.

2. Measured depth from KB: the depth from KB at each corresponding value of two way time.

3. Vertical depth from SRD: the vertical depth from SRD at each corresponding value of two way time.

4. Average velocity SRD to GEO: the vertical depth from SRD divided by half the two way time.

5. RMS velocity: the root mean square velocity from datum to the corresponding value of two way time.

$$v_{rms} = \sqrt{S_1^n v_i^2 t_i / S^n_1 t_i}$$

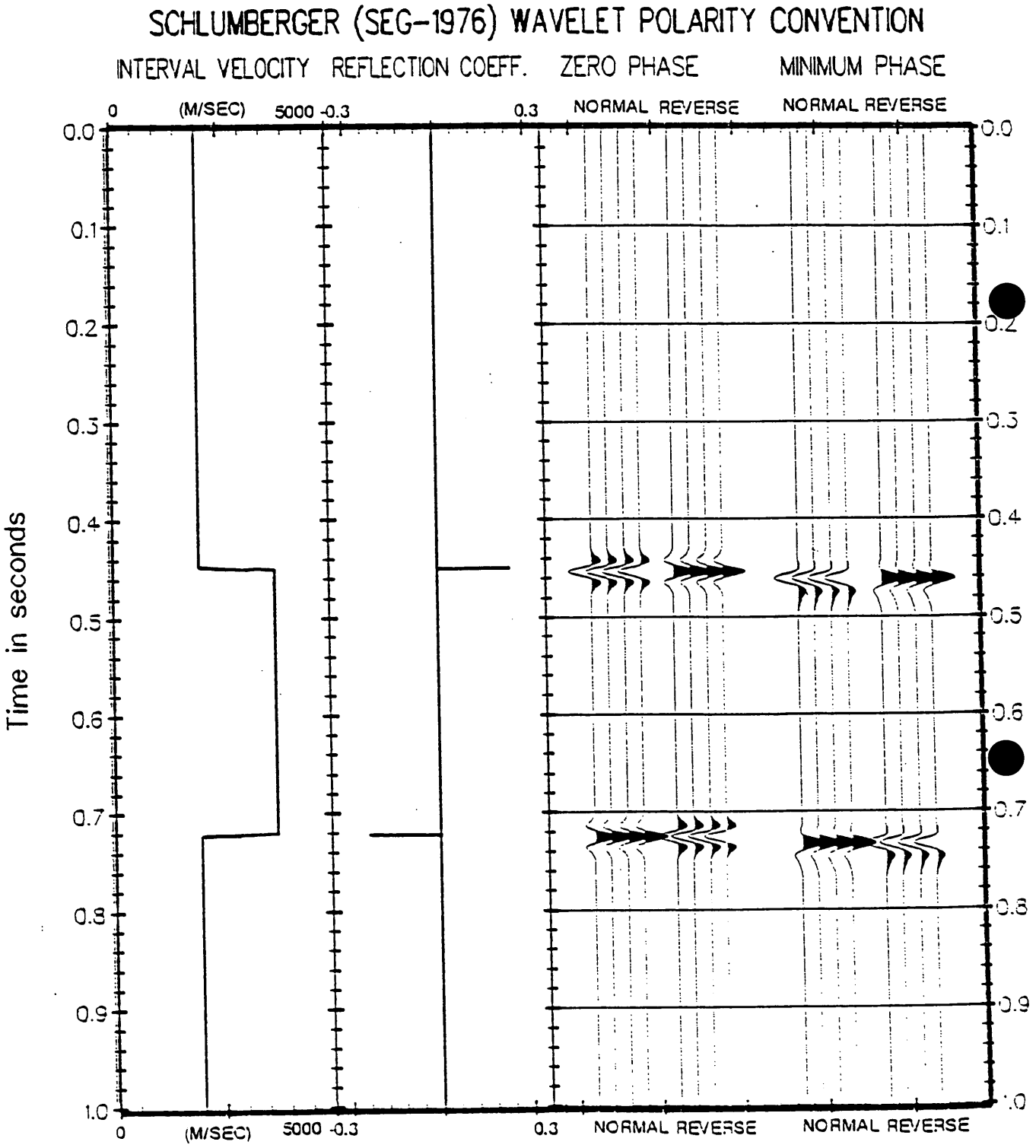
where v_i is the velocity between each 2 millisecs interval.

6. Interval velocity: the velocity between each sampled depth. Typically, the sampling rate is 2 millisecs two way time, (1 millisec one way time) therefore the interval velocity will be equal to the depth increment divided by 0.002. It is equivalent to column 9 from the Velocity Report.

Time to Depth

1. Two Way Sonic Time from SRD

2-11. Depth at Time 0-9 ms: moveout times every 1 ms


SCHLUMBERGER (SEG-1976) WAVELET POLARITY CONVENTION
INTERVAL VELOCITY
REFLECTION COEFF.
ZERO PHASE
MINIMUM PHASE
0
(M/SEC)
5000
-0.3
0.3
NORMAL
REVERSE
NORMAL
REVERSE
Time in seconds
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

TVD Computation Report

This is a report of the TVD Computation Module for the data described below.

Company/Well Information:

Company Name:	
Field:	IONA
Well:	IONA 5

Input Parameters:

General Parameters

Top Depth:	0.000 m
Bottom Depth:	1719.986 m
Sample Rate:	-0.152 m

TVD Parameters

Method of Computation:	Minimum Curvature Method
Type of Input Data:	Log Inputs Only
Stations Input File:	./tvdcomp.dat
Station Data Output Sample Type?:	Continuous
Magnetic Decl. Corr.?:	Yes
Magnetic Declination:	0.000 deg

Tie Point Parameters

Measured Depth:	0.0 m
True Vertical Depth:	0.0 m
Azimuth:	0.0 deg
Deviation:	0.000 deg
North/South Drift:	0.0 m
East/West Drift:	0.0 m

Output Data Arrays (Channels):

Measured Depth:	MD .TVD [A1989177]
True Vertical Depth:	TVD .TVD [A1989181]
X-Component of Well Departure	DX .TVD [A1989187]
Y-Component of Well Departure	DY .TVD [A1989184]

Output Array Data

Depth ft	Measured Depth m	True Vertical Depth m	X Well Departure m	Y Well Departure m
0.0	0.0	0.0	0.0	0.0
100.0	30.5	30.5	0.0	0.0
200.0	61.0	61.0	0.0	0.2
300.0	91.4	91.4	0.1	0.3
400.0	121.9	121.9	0.3	0.6
500.0	152.4	152.4	0.5	0.8
600.0	182.9	182.9	0.8	1.1
700.0	213.4	213.3	1.1	1.4
800.0	243.8	243.8	1.4	1.7
900.0	274.3	274.3	1.7	2.0
1000.0	304.8	304.8	1.9	2.3
1100.0	335.3	335.3	2.2	2.6
1200.0	365.8	365.7	2.5	2.8
1300.0	396.2	396.2	2.8	3.0
1400.0	426.7	426.7	3.2	3.1
1500.0	457.2	457.2	3.6	3.2
1600.0	487.7	487.6	4.0	3.2
1700.0	518.2	518.1	4.4	3.1
1800.0	548.6	548.6	4.8	2.9
1900.0	579.1	579.1	5.1	2.7
2000.0	609.6	609.6	5.4	2.4
2100.0	640.1	640.0	5.6	2.1
2200.0	670.6	670.5	5.7	1.7
2300.0	701.0	701.0	5.1	1.2
2400.0	731.5	731.4	3.2	0.8
2500.0	762.0	761.6	-0.9	0.8

Output Array Data (Continued)

Depth ft	Measured Depth m	True Vertical Depth m	X Well Departure m	Y Well Departure m
2600.0	792.5	791.2	-7.9	0.9
2700.0	823.0	820.0	-18.1	0.8
2800.0	853.4	847.8	-30.5	-0.0
2900.0	883.9	873.9	-46.0	-2.2
3000.0	914.4	898.2	-64.2	-4.9
3100.0	944.9	920.0	-85.2	-8.0
3200.0	975.4	939.6	-108.3	-11.9
3300.0	1005.8	958.7	-131.7	-15.7
3400.0	1036.3	977.5	-155.4	-19.7
3500.0	1066.8	996.1	-179.2	-23.7
3600.0	1097.3	1014.4	-203.2	-27.6
3700.0	1127.8	1032.5	-227.5	-31.3
3800.0	1158.2	1050.6	-251.8	-34.8
3900.0	1188.7	1068.6	-276.1	-38.4
4000.0	1219.2	1086.7	-300.3	-41.9
4100.0	1249.7	1105.0	-324.5	-45.1
4200.0	1280.2	1123.4	-348.6	-48.1
4300.0	1310.6	1141.7	-372.8	-50.9
4400.0	1341.1	1159.7	-397.3	-53.7
4500.0	1371.6	1177.5	-421.9	-56.4
4600.0	1402.1	1194.9	-446.8	-59.0
4700.0	1432.6	1212.2	-471.8	-61.5
4800.0	1463.0	1229.3	-496.9	-63.7
4900.0	1493.5	1246.1	-522.2	-65.9
5000.0	1524.0	1262.7	-547.7	-68.1
5100.0	1554.5	1279.0	-573.3	-70.2
5200.0	1585.0	1295.3	-599.0	-72.2
5300.0	1615.4	1311.3	-624.9	-74.2
5400.0	1645.9	1326.9	-651.0	-76.1
5500.0	1676.4	1342.3	-677.2	-78.0
5600.0	1706.9	1357.5	-703.6	-80.0

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GEOGRAM+
Well Seismic Report

DATE 10/27/99

Client and Well Information

Country	Australia
State	Victoria
Logging Date	7-MAY-1999
Company	
Field	IONA
Well	IONA 5

Check Shot Data

LEVEL NUMBER	VERTICAL DEPTH FROM SRD m	MEASURED DEPTH FROM KB m	OBSERVED TRAVEL TIME (owt) s	Vertical Transit Time-SRD (owt) s	DELTA DEPTH m	DELTA TIME s	SEISMIC INTERVAL VELOCITY m/s	SEISMIC AVERAGE VELOCITY m/s
1	0.0			0.0000				
							2128	
2	479.7	615.0	0.4418	0.2254				2128
					52.0	0.0206	2530	
3	531.6	667.0	0.4512	0.2460				2162
					344.3	0.1404	2451	
4	875.9	1092.0	0.4973	0.3864				2267
					64.1	0.0241	2661	
5	940.0	1200.0	0.5034	0.4105				2290
					62.4	0.0224	2786	
6	1002.4	1304.0	0.5131	0.4329				2316
					35.9	0.0115	3130	
7	1038.3	1365.0	0.5190	0.4444				2337
					47.4	0.0174	2717	
8	1085.7	1448.3	0.5308	0.4618				2351
					5.4	0.0021	2537	

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GEOGRAM+

Well Seismic Report

Check Shot Data (Continued)

LEVEL NUMBER	VERTICAL DEPTH FROM SRD m	MEASURED DEPTH FROM KB m	OBSERVED TRAVEL TIME (owt) s	Vertical Transit Time-SRD (owt) s	DELTA DEPTH m	DELTA TIME s	SEISMIC INTERVAL VELOCITY m/s	SEISMIC AVERAGE VELOCITY m/s
9	1091.2	1458.0	0.5324	0.4639				2352
					9.5	0.0034	2775	
10	1100.6	1475.0	0.5350	0.4673				2355
					12.7	0.0047	2681	
11	1113.3	1498.0	0.5387	0.4721				2358
					14.6	0.0060	2435	
12	1127.9	1525.0	0.5437	0.4781				2359
					18.7	0.0064	2948	
13	1146.7	1560.0	0.5491	0.4844				2367
					11.2	0.0044	2554	
14	1157.8	1581.0	0.5531	0.4888				2369
					8.0	0.0020	4072	
15	1165.8	1596.0	0.5548	0.4908				2375
					21.8	0.0067	3229	
16	1187.6	1638.0	0.5612	0.4975				2387
					14.7	0.0040	3673	
17	1202.3	1667.0	0.5653	0.5015				2397

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GEOGRAM+

Drift & Sonic Adjustment

DATE 10/27/99

Client and Well Information

Country	Australia
State	Victoria
Logging Date	7-MAY-1999
Company	
Field	IONA
Well	IONA 5

Knee and Zone Data

Raw Drift is computed at each shot level as

Shot Time - Sonic Time

From the raw drift curve, knees are selected. Knee depths define the zones for adjustment. Selected drift values define the amount of time adjustment to the sonic log in each zone.

When the gradient versus depth of the selected drift is POSITIVE, sonic velocities are deemed too fast. Sonic transit times are increased by a constant shift, the value of the selected drift gradient :

Adjusted DT = DT + Shift

When the gradient is NEGATIVE, sonic velocities are deemed too low. The excess sonic transit time over a threshold DT_Minimum is reduced by a constant reduction factor, G :

When DT < DT_Minimum Adjusted DT = DT

When DT > DT_Minimum Adjusted DT = G *(DT - DT_Minimum) + DT_Minimum

AFTER THE ADJUSTMENT OF THE SONIC LOG :

Residual is computed at each shot level as

Shot Time - Adjusted Sonic Time

It indicates how closely the adjustment has followed the shot times

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GEOGRAM+

Drift & Sonic Adjustment

Zone Set Data

KNEE NUMBER	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	SELECTED DRIFT AT KNEE ms	SHIFT us/m	DELTA_T MINIMUM us/m	REDUCTION FACTOR G	SELECTED DRIFT GRADIENT us/m
1	666.4	531.0	-0.0006				
				19.3			19.3
2	725.4	578.9	0.0024				
				15.4			15.4
3	803.5	642.3	0.0056				
				15.5			15.5
4	914.6	732.2	0.0102				
				15.4			15.4
5	1010.2	809.6	0.0141				
				14.4			14.4
6	1102.7	882.3	0.0175				
				4.6			4.6
7	1304.7	1002.8	0.0193				
					307.3	0.88	-4.3
8	1386.4	1050.5	0.0187				
				31.3			31.3
9	1448.5	1085.9	0.0223				
				37.5			37.5
10	1546.9	1139.6	0.0289				
				53.4			53.4
11	1580.6	1157.6	0.0320				
					263.0	0.25	-65.7
12	1661.9	1199.7	0.0230				

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Drift & Sonic Adjustment

Zone Set Data (Continued)

KNEE NUMBER	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	SELECTED DRIFT AT KNEE ms	SHIFT us/m	DELTA_T MINIMUM us/m	REDUCTION FACTOR G	SELECTED DRIFT GRADIENT us/m
					304.6	0.90	-3.9
13		1229.6	0.0226				

Sonic Adjustment Data

MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	VERTICAL SHOT TIME ms	ADJUSTED SONIC TIME ms	RAW DRIFT SHOT - SONIC ms	RESIDUAL SHOT - ADJUSTED SONIC ms	ADJUSTED INTERVAL VELOCITY m/s	ADJUSTED RMS VELOCITY m/s	ADJUSTED AVERAGE VELOCITY m/s
	0.0	0.0	0.0	-241.5				
						2128		
615.0	479.7	225.4	225.4	-16.1			2128	2128
						2128		
667.0	531.6	246.0	246.0	-0.0	-0.0		2164	2161
						2582		
1092.0	875.9	386.4	386.5	5.3	-0.1		2274	2266
						2461		
1200.0	940.0	410.5	410.7	5.5	-0.2		2298	2289
						2645		
1304.0	1002.4	432.9	433.1	5.9	-0.2		2326	2315
						2791		
1365.0	1038.3	444.4	445.0	5.3	-0.6		2348	2333
						2874		
1448.3	1085.7	461.8	462.0	6.8	-0.2		2366	2350
						3064		

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GEOGRAM+

Drift & Sonic Adjustment

Sonic Adjustment Data (Continued)

MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	VERTICAL SHOT TIME ms	ADJUSTED SONIC TIME ms	RAW DRIFT SHOT - SONIC ms	RESIDUAL SHOT - ADJUSTED SONIC ms	ADJUSTED INTERVAL VELOCITY m/s	ADJUSTED RMS VELOCITY m/s	ADJUSTED AVERAGE VELOCITY m/s
1458.0	1091.2	463.9	463.9	7.2	0.1		2368	2352
						2843		
1475.0	1100.6	467.3	467.4	7.5	-0.1		2371	2355
						2528		
1498.0	1113.3	472.1	472.3	7.7	-0.3		2373	2357
						2566		
1525.0	1127.9	478.1	478.0	8.7	0.1		2376	2360
						2600		
1560.0	1146.7	484.4	484.9	8.9	-0.5		2381	2365
						2797		
1581.0	1157.8	488.8	489.0	9.8	-0.2		2384	2368
						3668		
1596.0	1165.8	490.8	491.3	8.9	-0.5		2390	2373
						3522		
1638.0	1187.6	497.5	497.6	7.5	-0.1		2407	2387
						3541		
1667.0	1202.3	501.5	501.8	6.9	-0.3		2418	2396
						2902		

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GEOGRAM+
Time To Depth Report

DATE 10/27/99

Client and Well Information

Country	Australia
State	Victoria
Logging Date	7-MAY-1999
Company	
Field	IONA
Well	IONA 5

Time To Depth Data

TWO WAY SONIC TIME FROM SRD ms	DEPTH AT TIME +0 ms m	DEPTH AT TIME +1 ms m	DEPTH AT TIME +2 ms m	DEPTH AT TIME +3 ms m	DEPTH AT TIME +4 ms m	DEPTH AT TIME +5 ms m	DEPTH AT TIME +6 ms m	DEPTH AT TIME +7 ms m	DEPTH AT TIME +8 ms m	DEPTH AT TIME +9 ms m
0	0.0	1.1	2.1	3.2	4.3	5.3	6.4	7.5	8.5	9.6
10	10.7	11.7	12.8	13.9	14.9	16.0	17.1	18.1	19.2	20.3
20	21.3	22.4	23.5	24.5	25.6	26.7	27.7	28.8	29.7	30.8
30	31.9	32.9	34.0	35.1	36.1	37.2	38.3	39.3	40.4	41.5
40	42.5	43.6	44.7	45.7	46.8	47.9	48.9	50.0	51.1	52.1
50	53.2	54.3	55.3	56.4	57.5	58.5	59.6	60.7	61.7	62.8
60	63.9	64.9	66.0	67.1	68.1	69.2	70.3	71.3	72.4	73.5
70	74.5	75.6	76.7	77.7	78.8	79.9	80.9	82.0	83.1	84.1
80	85.2	86.3	87.2	88.2	89.3	90.4	91.4	92.5	93.6	94.6
90	95.7	96.8	97.8	98.9	100.0	101.0	102.1	103.2	104.2	105.3
100	106.4	107.4	108.5	109.6	110.6	111.7	112.8	113.8	114.9	116.0
110	117.0	118.1	119.2	120.2	121.3	122.4	123.4	124.5	125.6	126.6
120	127.7	128.8	129.8	130.9	132.0	133.0	134.1	135.2	136.2	137.3
130	138.4	139.4	140.5	141.6	142.6	143.7	144.6	145.7	146.8	147.8
140	148.9	150.0	151.0	152.1	153.2	154.2	155.3	156.4	157.4	158.5

Schlumberger

GEOGRAM+

Time To Depth Report

Time To Depth Data (Continued)

TWO WAY SONIC TIME FROM SRD ms	DEPTH AT TIME +0 ms m	DEPTH AT TIME +1 ms m	DEPTH AT TIME +2 ms m	DEPTH AT TIME +3 ms m	DEPTH AT TIME +4 ms m	DEPTH AT TIME +5 ms m	DEPTH AT TIME +6 ms m	DEPTH AT TIME +7 ms m	DEPTH AT TIME +8 ms m	DEPTH AT TIME +9 ms m
150	159.6	160.6	161.7	162.8	163.8	164.9	166.0	167.0	168.1	169.2
160	170.2	171.3	172.4	173.4	174.5	175.6	176.6	177.7	178.8	179.8
170	180.9	182.0	183.0	184.1	185.2	186.2	187.3	188.4	189.4	190.5
180	191.6	192.6	193.7	194.8	195.8	196.9	198.0	199.0	200.1	201.2
190	202.1	203.1	204.2	205.3	206.3	207.4	208.5	209.6	210.6	211.7
200	212.8	213.8	214.9	216.0	217.0	218.1	219.2	220.2	221.3	222.4
210	223.4	224.5	225.6	226.6	227.7	228.8	229.8	230.9	232.0	233.0
220	234.1	235.2	236.2	237.3	238.4	239.4	240.5	241.6	242.6	243.7
230	244.8	245.8	246.9	248.0	249.0	250.1	251.2	252.2	253.3	254.4
240	255.4	256.5	257.6	258.6	259.5	260.6	261.7	262.7	263.8	264.9
250	265.9	267.0	268.1	269.1	270.2	271.3	272.3	273.4	274.5	275.5
260	276.6	277.7	278.7	279.8	280.9	281.9	283.0	284.1	285.1	286.2
270	287.3	288.3	289.4	290.5	291.5	292.6	293.7	294.7	295.8	296.9
280	297.9	299.0	300.1	301.1	302.2	303.3	304.3	305.4	306.5	307.5
290	308.6	309.7	310.7	311.8	312.9	313.9	315.0	316.1	317.0	318.1
300	319.1	320.2	321.3	322.3	323.4	324.5	325.5	326.6	327.7	328.7
310	329.8	330.9	331.9	333.0	334.1	335.1	336.2	337.3	338.3	339.4
320	340.5	341.5	342.6	343.7	344.7	345.8	346.9	347.9	349.0	350.1
330	351.1	352.2	353.3	354.3	355.4	356.5	357.5	358.6	359.7	360.7
340	361.8	362.9	363.9	365.0	366.1	367.1	368.2	369.3	370.3	371.4
350	372.5	373.5	374.4	375.5	376.6	377.6	378.7	379.8	380.8	381.9
360	383.0	384.0	385.1	386.2	387.2	388.3	389.4	390.4	391.5	392.6
370	393.6	394.7	395.8	396.8	397.9	399.0	400.1	401.1	402.2	403.3
380	404.3	405.4	406.5	407.5	408.6	409.7	410.7	411.8	412.9	413.9

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GEOGRAM+

Time To Depth Report

Time To Depth Data (Continued)

TWO WAY SONIC TIME FROM SRD ms	DEPTH AT TIME +0 ms m	DEPTH AT TIME +1 ms m	DEPTH AT TIME +2 ms m	DEPTH AT TIME +3 ms m	DEPTH AT TIME +4 ms m	DEPTH AT TIME +5 ms m	DEPTH AT TIME +6 ms m	DEPTH AT TIME +7 ms m	DEPTH AT TIME +8 ms m	DEPTH AT TIME +9 ms m
390	415.0	416.1	417.1	418.2	419.3	420.3	421.4	422.5	423.5	424.6
400	425.7	426.7	427.8	428.9	429.9	431.0	431.9	433.0	434.0	435.1
410	436.2	437.2	438.3	439.4	440.4	441.5	442.6	443.6	444.7	445.8
420	446.8	447.9	449.0	450.0	451.1	452.2	453.2	454.3	455.4	456.4
430	457.5	458.6	459.6	460.7	461.8	462.8	463.9	465.0	466.0	467.1
440	468.2	469.2	470.3	471.4	472.4	473.5	474.6	475.6	476.7	477.8
450	478.8	479.9	481.1	482.3	483.7	484.9	486.2	487.5	488.7	490.0
460	491.2	492.6	493.8	495.0	496.4	497.6	498.8	500.2	501.4	502.6
470	503.8	505.2	506.4	507.6	509.0	510.2	511.5	512.8	514.0	515.3
480	516.5	517.9	519.1	520.3	521.7	522.9	524.1	525.5	526.7	527.9
490	529.1	530.5	531.7	533.1	534.3	535.4	536.6	537.8	539.0	540.3
500	541.6	542.8	544.1	545.4	546.7	547.9	549.1	550.3	551.5	552.8
510	553.8	555.0	556.3	557.5	558.7	559.9	561.1	562.5	563.7	564.9
520	566.0	567.2	568.5	569.7	571.0	572.3	573.5	574.9	576.2	577.6
530	578.7	579.9	581.1	582.2	583.5	584.9	586.1	587.3	588.6	589.8
540	591.0	592.2	593.4	594.7	595.9	597.1	598.5	599.5	600.8	602.0
550	603.2	604.4	605.6	607.0	608.4	609.8	611.1	612.2	613.4	614.5
560	615.7	616.8	618.1	619.4	620.6	621.6	622.9	624.1	625.1	626.4
570	627.6	628.8	630.0	631.4	632.5	633.7	634.9	636.1	637.3	638.4
580	639.6	640.7	641.9	643.1	644.2	645.4	646.6	647.9	648.9	650.1
590	651.4	652.6	653.8	655.2	656.4	657.8	659.0	660.2	661.4	662.5
600	663.7	664.8	666.0	667.2	668.4	669.6	670.9	672.1	673.3	674.5
610	675.9	677.1	678.3	679.6	680.8	682.0	683.2	684.4	685.6	686.9
620	688.1	689.3	690.5	691.7	693.0	694.3	695.6	696.9	698.1	699.4

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GEOGRAM+

Time To Depth Report

Time To Depth Data (Continued)

TWO WAY SONIC TIME FROM SRD ms	DEPTH AT TIME +0 ms m	DEPTH AT TIME +1 ms m	DEPTH AT TIME +2 ms m	DEPTH AT TIME +3 ms m	DEPTH AT TIME +4 ms m	DEPTH AT TIME +5 ms m	DEPTH AT TIME +6 ms m	DEPTH AT TIME +7 ms m	DEPTH AT TIME +8 ms m	DEPTH AT TIME +9 ms m
630	700.6	701.8	703.0	704.2	705.5	706.7	707.9	709.1	710.5	711.7
640	712.9	714.0	715.2	716.3	717.5	718.6	719.8	720.9	722.1	723.3
650	724.5	725.7	726.9	728.3	729.5	730.8	732.0	733.2	734.4	735.5
660	736.7	737.9	739.1	740.2	741.4	742.6	744.0	745.5	746.9	748.3
670	749.7	751.0	752.2	753.3	754.7	755.9	757.1	758.3	759.6	760.8
680	762.2	763.4	764.6	765.8	767.0	768.2	769.5	770.7	771.9	773.0
690	774.2	775.4	776.5	777.7	778.9	780.1	781.2	782.4	783.6	784.9
700	786.1	787.3	788.4	789.6	790.8	792.0	793.1	794.5	795.7	796.9
710	798.0	799.2	800.3	801.5	802.7	803.8	805.0	806.0	807.3	808.3
720	809.5	810.8	812.1	813.4	814.4	815.6	817.2	818.7	820.1	821.3
730	822.5	823.7	824.9	826.3	827.5	828.8	830.0	831.2	832.4	833.6
740	834.8	836.1	837.3	838.5	839.7	840.9	842.3	843.5	844.8	846.0
750	847.3	848.6	849.8	851.0	852.5	853.7	855.0	856.2	857.4	858.8
760	860.0	861.2	862.4	863.7	864.9	866.1	867.3	868.5	869.7	871.0
770	872.2	873.4	874.6	875.8	877.2	878.4	879.7	881.0	882.4	883.8
780	885.1	886.4	887.7	889.1	890.3	891.5	892.9	894.1	895.5	896.9
790	898.2	899.5	900.7	902.1	903.3	904.6	906.0	907.4	908.9	910.3
800	911.5	912.9	914.2	915.6	917.0	918.2	919.6	921.0	922.3	923.5
810	924.9	926.1	927.5	928.7	929.9	931.2	932.5	933.9	935.1	936.7
820	938.0	939.4	940.8	942.0	943.4	944.7	946.3	947.6	949.0	950.4
830	951.7	953.1	954.6	956.0	957.4	958.7	960.1	961.5	962.9	964.2
840	965.6	967.0	968.5	969.9	971.4	972.8	974.3	975.7	977.0	978.6
850	979.9	981.3	982.7	984.0	985.3	986.6	988.2	989.5	991.1	992.4
860	993.8	995.2	996.5	998.1	999.4	1000.8	1002.3	1003.7	1004.9	1006.4

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GEOGRAM+

Time To Depth Report

Time To Depth Data (Continued)

TWO WAY SONIC TIME FROM SRD ms	DEPTH AT TIME +0 ms m	DEPTH AT TIME +1 ms m	DEPTH AT TIME +2 ms m	DEPTH AT TIME +3 ms m	DEPTH AT TIME +4 ms m	DEPTH AT TIME +5 ms m	DEPTH AT TIME +6 ms m	DEPTH AT TIME +7 ms m	DEPTH AT TIME +8 ms m	DEPTH AT TIME +9 ms m
870	1008.0	1009.7	1011.0	1012.4	1014.1	1015.3	1016.8	1018.5	1020.2	1021.8
880	1023.7	1025.2	1026.9	1028.4	1029.9	1031.4	1032.8	1034.2	1035.6	1036.9
890	1038.5	1039.8	1041.2	1042.6	1044.1	1045.6	1047.0	1048.4	1049.9	1051.3
900	1052.5	1053.5	1054.8	1055.8	1057.0	1058.3	1059.8	1061.2	1062.7	1064.2
910	1065.6	1067.0	1068.3	1069.8	1071.4	1072.7	1074.1	1075.6	1077.2	1078.7
920	1080.2	1081.6	1083.0	1084.3	1085.8	1087.2	1088.7	1090.1	1091.5	1093.0
930	1094.4	1095.6	1097.0	1098.3	1099.6	1100.8	1102.2	1103.4	1104.7	1106.0
940	1107.2	1108.6	1109.8	1111.1	1112.4	1113.7	1115.0	1116.3	1117.5	1118.9
950	1120.1	1121.5	1122.7	1124.1	1125.3	1126.7	1127.9	1129.3	1130.7	1131.9
960	1133.2	1134.5	1135.8	1137.2	1138.4	1140.0	1141.3	1142.7	1144.1	1145.6
970	1147.0	1148.3	1149.7	1151.1	1152.4	1153.8	1155.0	1156.4	1157.9	1159.6
980	1161.4	1163.1	1164.9	1166.6	1168.5	1170.1	1171.8	1173.5	1175.2	1177.0
990	1178.7	1180.3	1182.0	1183.7	1185.5	1187.3	1189.0	1190.9	1192.7	1194.5
1000	1196.3	1198.2	1200.0	1201.4	1202.7	1204.1	1205.6	1207.0	1208.5	1210.1
1010	1211.4	1212.8	1214.3	1216.0	1217.5	1219.0	1220.6	1221.9	1223.6	1225.3
1020	1226.7	1228.0								

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GEOGRAM+
Velocity Report

DATE 10/27/9

Client and Well Information

Country	Australia
State	Victoria
Logging Date	7-MAY-1999
Company	
Field	IONA
Well	IONA 5

Velocity Data

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
0		0.0			
					2128
2		2.1	2128	2128	
					2128
4		4.3	2128	2128	
					2128
6		6.4	2128	2128	
					2128
8		8.5	2128	2128	
					2128
10		10.7	2128	2128	
					2128
12		12.8	2128	2128	
					2128
14		14.9	2128	2128	

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GEOGRAM+

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
16		17.1	2128	2128	
					2128
18		19.2	2128	2128	
					2128
20		21.3	2128	2128	
					2128
22		23.5	2128	2128	
					2128
24		25.6	2128	2128	
					2128
26		27.7	2128	2128	
					2128
28		29.7	2128	2128	
					2128
30		31.9	2128	2128	
					2128
32		34.0	2128	2128	
					2128
34		36.1	2128	2128	
					2128
36		38.3	2128	2128	
					2128
38		40.4	2128	2128	

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GEOGRAM+

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
40		42.5	2128	2128	
					2128
42		44.7	2128	2128	
					2128
44		46.8	2128	2128	
					2128
46		48.9	2128	2128	
					2128
48		51.1	2128	2128	
					2128
50		53.2	2128	2128	
					2128
52		55.3	2128	2128	
					2128
54		57.5	2128	2128	
					2128
56		59.6	2128	2128	
					2128
58		61.7	2128	2128	
					2128
60		63.9	2128	2128	
					2128
62		66.0	2128	2128	

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GEOGRAM+

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
64		68.1	2128	2128	
					2128
66		70.3	2128	2128	
					2128
68		72.4	2128	2128	
					2128
70		74.5	2128	2128	
					2128
72		76.7	2128	2128	
					2128
74		78.8	2128	2128	
					2128
76		80.9	2128	2128	
					2128
78		83.1	2128	2128	
					2128
80		85.2	2128	2128	
					2128
82		87.2	2128	2128	
					2128
84		89.3	2128	2128	
					2128
86		91.4	2128	2128	

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GEOGRAM+
Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
88		93.6	2128	2128	
					2128
90		95.7	2128	2128	
					2128
92		97.8	2128	2128	
					2128
94		100.0	2128	2128	
					2128
96		102.1	2128	2128	
					2128
98		104.2	2128	2128	
					2128
100		106.4	2128	2128	
					2128
102		108.5	2128	2128	
					2128
104		110.6	2128	2128	
					2128
106		112.8	2128	2128	
					2128
108		114.9	2128	2128	
					2128
110		117.0	2128	2128	

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GEOGRAM+

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
112		119.2	2128	2128	
					2128
114		121.3	2128	2128	
					2128
116		123.4	2128	2128	
					2128
118		125.6	2128	2128	
					2128
120		127.7	2128	2128	
					2128
122		129.8	2128	2128	
					2128
124		132.0	2128	2128	
					2128
126		134.1	2128	2128	
					2128
128		136.2	2128	2128	
					2128
130		138.4	2128	2128	
					2128
132		140.5	2128	2128	
					2128
134		142.6	2128	2128	

Schlumberger

GEOGRAM+

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
136		144.6	2128	2128	
					2128
138		146.8	2128	2128	
					2128
140		148.9	2128	2128	
					2128
142		151.0	2128	2128	
					2128
144		153.2	2128	2128	
					2128
146		155.3	2128	2128	
					2128
148		157.4	2128	2128	
					2128
150		159.6	2128	2128	
					2128
152		161.7	2128	2128	
					2128
154		163.8	2128	2128	
					2128
156		166.0	2128	2128	
					2128
158		168.1	2128	2128	

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GEOGRAM+
Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
160		170.2	2128	2128	
					2128
162		172.4	2128	2128	
					2128
164		174.5	2128	2128	
					2128
166		176.6	2128	2128	
					2128
168		178.8	2128	2128	
					2128
170		180.9	2128	2128	
					2128
172		183.0	2128	2128	
					2128
174		185.2	2128	2128	
					2128
176		187.3	2128	2128	
					2128
178		189.4	2128	2128	
					2128
180		191.6	2128	2128	
					2128
182		193.7	2128	2128	

Schlumberger

GEOGRAM+

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
184		195.8	2128	2128	
					2128
186		198.0	2128	2128	
					2128
188		200.1	2128	2128	
					2128
190		202.1	2128	2128	
					2128
192		204.2	2128	2128	
					2128
194		206.3	2128	2128	
					2128
196		208.5	2128	2128	
					2128
198		210.6	2128	2128	
					2128
200		212.8	2128	2128	
					2128
202		214.9	2128	2128	
					2128
204		217.0	2128	2128	
					2128
206		219.2	2128	2128	

Schlumberger

GEOGRAM+
Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
208		221.3	2128	2128	
					2128
210		223.4	2128	2128	
					2128
212		225.6	2128	2128	
					2128
214		227.7	2128	2128	
					2128
216		229.8	2128	2128	
					2128
218		232.0	2128	2128	
					2128
220		234.1	2128	2128	
					2128
222		236.2	2128	2128	
					2128
224		238.4	2128	2128	
					2128
226		240.5	2128	2128	
					2128
228		242.6	2128	2128	
					2128
230		244.8	2128	2128	

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GEOGRAM+
Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
232		246.9	2128	2128	
					2128
234		249.0	2128	2128	
					2128
236		251.2	2128	2128	
					2128
238		253.3	2128	2128	
					2128
240		255.4	2128	2128	
					2128
242		257.6	2128	2128	
					2128
244		259.5	2128	2128	
					2128
246		261.7	2128	2128	
					2128
248		263.8	2128	2128	
					2128
250		265.9	2128	2128	
					2128
252		268.1	2128	2128	
					2128
254		270.2	2128	2128	

Schlumberger

GEOGRAM+

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
256		272.3	2128	2128	
					2128
258		274.5	2128	2128	
					2128
260		276.6	2128	2128	
					2128
262		278.7	2128	2128	
					2128
264		280.9	2128	2128	
					2128
266		283.0	2128	2128	
					2128
268		285.1	2128	2128	
					2128
270		287.3	2128	2128	
					2128
272		289.4	2128	2128	
					2128
274		291.5	2128	2128	
					2128
276		293.7	2128	2128	
					2128
278		295.8	2128	2128	

Schlumberger

GEOGRAM+

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
280		297.9	2128	2128	
					2128
282		300.1	2128	2128	
					2128
284		302.2	2128	2128	
					2128
286		304.3	2128	2128	
					2128
288		306.5	2128	2128	
					2128
290		308.6	2128	2128	
					2128
292		310.7	2128	2128	
					2128
294		312.9	2128	2128	
					2128
296		315.0	2128	2128	
					2128
298		317.0	2128	2128	
					2128
300		319.1	2128	2128	
					2128
302		321.3	2128	2128	

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GEOGRAM+
Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
304		323.4	2128	2128	
					2128
306		325.5	2128	2128	
					2128
308		327.7	2128	2128	
					2128
310		329.8	2128	2128	
					2128
312		331.9	2128	2128	
					2128
314		334.1	2128	2128	
					2128
316		336.2	2128	2128	
					2128
318		338.3	2128	2128	
					2128
320		340.5	2128	2128	
					2128
322		342.6	2128	2128	
					2128
324		344.7	2128	2128	
					2128
326		346.9	2128	2128	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
328		349.0	2128	2128	
					2128
330		351.1	2128	2128	
					2128
332		353.3	2128	2128	
					2128
334		355.4	2128	2128	
					2128
336		357.5	2128	2128	
					2128
338		359.7	2128	2128	
					2128
340		361.8	2128	2128	
					2128
342		363.9	2128	2128	
					2128
344		366.1	2128	2128	
					2128
346		368.2	2128	2128	
					2128
348		370.3	2128	2128	
					2128
350		372.5	2128	2128	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
352		374.4	2128	2128	
					2128
354		376.6	2128	2128	
					2128
356		378.7	2128	2128	
					2128
358		380.8	2128	2128	
					2128
360		383.0	2128	2128	
					2128
362		385.1	2128	2128	
					2128
364		387.2	2128	2128	
					2128
366		389.4	2128	2128	
					2128
368		391.5	2128	2128	
					2128
370		393.6	2128	2128	
					2128
372		395.8	2128	2128	
					2128
374		397.9	2128	2128	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
376		400.1	2128	2128	
					2128
378		402.2	2128	2128	
					2128
380		404.3	2128	2128	
					2128
382		406.5	2128	2128	
					2128
384		408.6	2128	2128	
					2128
386		410.7	2128	2128	
					2128
388		412.9	2128	2128	
					2128
390		415.0	2128	2128	
					2128
392		417.1	2128	2128	
					2128
394		419.3	2128	2128	
					2128
396		421.4	2128	2128	
					2128
398		423.5	2128	2128	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
400		425.7	2128	2128	
					2128
402		427.8	2128	2128	
					2128
404		429.9	2128	2128	
					2128
406		431.9	2128	2128	
					2128
408		434.0	2128	2128	
					2128
410		436.2	2128	2128	
					2128
412		438.3	2128	2128	
					2128
414		440.4	2128	2128	
					2128
416		442.6	2128	2128	
					2128
418		444.7	2128	2128	
					2128
420		446.8	2128	2128	
					2128
422		449.0	2128	2128	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
424		451.1	2128	2128	
					2128
426		453.2	2128	2128	
					2128
428		455.4	2128	2128	
					2128
430		457.5	2128	2128	
					2128
432		459.6	2128	2128	
					2128
434		461.8	2128	2128	
					2128
436		463.9	2128	2128	
					2128
438		466.0	2128	2128	
					2128
440		468.2	2128	2128	
					2128
442		470.3	2128	2128	
					2128
444		472.4	2128	2128	
					2128
446		474.6	2128	2128	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2128
448		476.7	2128	2128	
					2128
450		478.8	2128	2128	
					2128
452	616.5	481.1	2129	2129	
					2128
454	619.1	483.7	2131	2131	
					2530
456	621.5	486.2	2132	2133	
					2529
458	624.1	488.7	2134	2135	
					2530
460	626.5	491.2	2136	2137	
					2530
462	629.1	493.8	2138	2139	
					2530
464	631.7	496.4	2139	2140	
					2530
466	634.2	498.8	2141	2142	
					2530
468	636.7	501.4	2143	2144	
					2530
470	639.2	503.8	2144	2146	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2530
472	641.8	506.4	2146	2148	
					2530
474	644.4	509.0	2148	2149	
					2530
476	646.8	511.5	2149	2151	
					2530
478	649.4	514.0	2151	2153	
					2530
480	651.8	516.5	2152	2154	
					2530
482	654.4	519.1	2154	2156	
					2530
484	657.0	521.7	2155	2158	
					2530
486	659.5	524.1	2157	2159	
					2530
488	662.0	526.7	2159	2161	
					2530
490	664.5	529.1	2160	2163	
					2530
492	667.1	531.7	2162	2164	
					2530
494	670.3	534.3	2163	2166	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2703
496	673.1	536.6	2164	2167	
					2464
498	676.1	539.0	2165	2168	
					2287
500	679.3	541.6	2166	2170	
					2675
502	682.3	544.1	2168	2171	
					2827
504	685.5	546.7	2169	2173	
					2537
506	688.5	549.1	2170	2174	
					2408
508	691.5	551.5	2171	2175	
					2412
510	694.4	553.8	2172	2176	
					2418
512	697.4	556.3	2173	2177	
					2374
514	700.4	558.7	2174	2178	
					2435
516	703.4	561.1	2175	2179	
					2405
518	706.6	563.7	2177	2180	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2565
520	709.4	566.0	2177	2181	
					2461
522	712.4	568.5	2178	2182	
					2337
524	715.6	571.0	2180	2183	
					2502
526	718.6	573.5	2181	2185	
					2598
528	722.0	576.2	2183	2187	
					2391
530	725.0	578.7	2184	2188	
					3095
532	728.0	581.1	2185	2189	
					2295
534	731.1	583.5	2186	2190	
					2348
536	734.3	586.1	2187	2192	
					3068
538	737.3	588.6	2188	2193	
					2562
540	740.3	591.0	2189	2194	
					2658
542	743.3	593.4	2190	2195	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2464
544	746.3	595.9	2191	2196	
					2377
546	749.5	598.5	2192	2197	
					2442
548	752.3	600.8	2193	2197	
					2441
550	755.3	603.2	2193	2198	
					2364
552	758.3	605.6	2195	2200	
					2449
554	761.7	608.4	2196	2201	
					2518
556	765.1	611.1	2198	2204	
					2830
558	767.9	613.4	2198	2204	
					2329
560	770.8	615.7	2199	2204	
					2306
562	773.8	618.1	2200	2205	
					2319
564	776.8	620.6	2200	2206	
					2637
566	779.6	622.9	2201	2206	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2390
568	782.4	625.1	2201	2207	
					2349
570	785.4	627.6	2202	2208	
					2318
572	788.4	630.0	2203	2208	
					2451
574	791.4	632.5	2204	2209	
					2488
576	794.5	634.9	2205	2210	
					2375
578	797.3	637.2	2205	2211	
					2341
580	800.3	639.6	2205	2211	
					2355
582	803.1	641.9	2206	2211	
					2333
584	805.9	644.2	2206	2212	
					2308
586	808.9	646.6	2207	2212	
					2281
588	811.8	648.9	2207	2213	
					2444
590	814.8	651.4	2208	2214	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2365
592	817.8	653.8	2209	2215	
					2437
594	821.0	656.4	2210	2216	
					2519
596	824.2	659.0	2211	2217	
					2656
598	827.2	661.4	2212	2218	
					2412
600	830.0	663.7	2212	2218	
					2331
602	832.8	666.0	2213	2219	
					2275
604	835.8	668.4	2213	2219	
					2349
606	838.9	670.9	2214	2220	
					2348
608	841.9	673.3	2215	2221	
					2412
610	845.1	675.9	2216	2222	
					2475
612	848.1	678.3	2217	2223	
					2525
614	851.1	680.8	2217	2223	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2366
616	854.1	683.2	2218	2224	
					2492
618	857.1	685.6	2219	2225	
					2396
620	860.1	688.1	2220	2226	
					2648
622	863.1	690.5	2220	2226	
					2388
624	866.1	693.0	2221	2227	
					2444
626	869.3	695.6	2222	2228	
					2422
628	872.5	698.1	2223	2229	
					2496
630	875.5	700.6	2224	2230	
					2637
632	878.6	703.0	2225	2231	
					2377
634	881.6	705.5	2225	2231	
					2444
636	884.6	707.9	2226	2232	
					2399
638	887.8	710.5	2227	2234	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2617
640	890.8	712.9	2228	2234	
					2760
642	893.6	715.2	2228	2234	
					2352
644	896.4	717.5	2228	2234	
					2225
646	899.2	719.8	2228	2235	
					2255
648	902.1	722.1	2229	2235	
					2338
650	905.1	724.5	2229	2236	
					2473
652	908.1	726.9	2230	2236	
					2323
654	911.3	729.5	2231	2237	
					2460
656	914.3	732.0	2232	2238	
					2467
658	917.3	734.4	2232	2238	
					2397
660	920.1	736.7	2232	2239	
					2303
662	923.1	739.1	2233	2239	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2365
664	926.0	741.4	2233	2240	
					2375
666	929.2	744.0	2234	2241	
					2441
668	932.7	746.9	2236	2243	
					3118
670	936.1	749.7	2238	2245	
					2749
672	939.3	752.2	2239	2246	
					2491
674	942.3	754.7	2239	2246	
					2382
676	945.3	757.1	2240	2247	
					2588
678	948.3	759.6	2240	2247	
					2475
680	951.5	762.2	2241	2249	
					2404
682	954.6	764.6	2242	2249	
					2494
684	957.6	767.0	2243	2250	
					2420
686	960.6	769.5	2243	2250	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2482
688	963.6	771.9	2244	2251	
					2409
690	966.4	774.2	2244	2251	
					2461
692	969.2	776.5	2244	2251	
					2338
694	972.2	778.9	2245	2252	
					2240
696	975.1	781.2	2245	2252	
					2328
698	978.1	783.6	2245	2252	
					2319
700	981.1	786.1	2246	2253	
					2455
702	983.9	788.4	2246	2253	
					2302
704	986.9	790.8	2247	2254	
					2371
706	989.7	793.1	2247	2254	
					2352
708	992.9	795.7	2248	2255	
					2411
710	995.8	798.0	2248	2255	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2467
712	998.6	800.3	2248	2255	
					2280
714	1001.6	802.7	2248	2255	
					2321
716	1004.4	805.0	2248	2255	
					2330
718	1007.2	807.3	2249	2255	
					2317
720	1010.1	809.5	2249	2256	
					2282
722	1013.3	812.1	2250	2256	
					2354
724	1016.1	814.4	2250	2257	
					2523
726	1019.5	817.2	2251	2258	
					2428
728	1022.8	819.9	2253	2260	
					3458
730	1026.0	822.5	2253	2261	
					2628
732	1029.1	824.9	2254	2261	
					2392
734	1032.3	827.5	2255	2262	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2622
736	1035.3	830.0	2255	2263	
					2338
738	1038.3	832.4	2256	2263	
					2616
740	1041.3	834.8	2256	2264	
					2496
742	1044.3	837.3	2257	2264	
					2527
744	1047.3	839.7	2257	2265	
					2365
746	1050.5	842.3	2258	2266	
					2459
748	1053.5	844.8	2259	2266	
					2492
750	1056.7	847.3	2259	2267	
					2428
752	1059.7	849.8	2260	2268	
					2444
754	1063.1	852.5	2261	2269	
					2524
756	1066.1	855.0	2262	2270	
					2384
758	1069.1	857.4	2262	2270	

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Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2463
760	1072.3	860.0	2263	2271	
					2461
762	1075.3	862.4	2264	2271	
					2537
764	1078.3	864.9	2264	2272	
					2421
766	1081.4	867.3	2265	2273	
					2408
768	1084.4	869.7	2265	2273	
					2384
770	1087.4	872.2	2266	2273	
					2366
772	1090.4	874.6	2266	2274	
					2472
774	1094.2	877.2	2267	2274	
					2558
776	1098.3	879.7	2267	2275	
					2406
778	1102.9	882.4	2269	2277	
					2563
780	1107.5	885.1	2270	2278	
					2857
782	1111.9	887.7	2270	2279	

Schlumberger

GEOGRAM+

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2679
784	1116.3	890.3	2271	2279	
					2658
786	1120.6	892.9	2272	2280	
					2585
788	1125.0	895.5	2273	2281	
					2631
790	1129.6	898.2	2274	2282	
					2574
792	1133.7	900.7	2274	2283	
					2504
794	1138.1	903.3	2275	2284	
					2476
796	1142.7	906.0	2277	2285	
					2641
798	1147.6	908.9	2278	2287	
					2952
800	1152.0	911.5	2279	2288	
					2754
802	1156.6	914.2	2280	2289	
					2639
804	1161.0	916.8	2281	2290	
					2631
806	1165.6	919.6	2282	2291	

Schlumberger

GEOGRAM+
Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2656
808	1170.2	922.3	2283	2292	
					2581
810	1174.6	924.9	2284	2293	
					2583
812	1178.9	927.5	2284	2293	
					2527
814	1183.1	929.9	2285	2294	
					2475
816	1187.4	932.5	2286	2295	
					2497
818	1191.8	935.1	2286	2296	
					2676
820	1196.7	938.0	2288	2297	
					2609
822	1201.3	940.8	2289	2298	
					2693
824	1205.6	943.4	2290	2299	
					2693
826	1210.4	946.3	2291	2301	
					2735
828	1215.0	949.0	2292	2302	
					2841
830	1219.6	951.7	2293	2303	

Schlumberger

GEOGRAM+
Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2788
832	1224.1	954.5	2295	2304	
					2782
834	1229.0	957.4	2296	2306	
					2946
836	1233.5	960.1	2297	2307	
					2855
838	1238.1	962.9	2298	2308	
					2868
840	1242.7	965.6	2299	2309	
					2717
842	1247.5	968.5	2300	2311	
					2784
844	1252.3	971.4	2302	2312	
					2912
846	1257.1	974.3	2303	2314	
					2889
848	1261.7	977.0	2304	2315	
					2839
850	1266.5	979.9	2306	2317	
					2807
852	1271.1	982.7	2307	2318	
					2821
854	1275.4	985.3	2307	2318	

Schlumberger

GEOGRAM+
Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2729
856	1280.2	988.2	2309	2320	
					2580
858	1285.1	991.1	2310	2321	
					2788
860	1289.6	993.8	2311	2322	
					2828
862	1294.2	996.5	2312	2324	
					2790
864	1299.0	999.4	2314	2325	
					2773
866	1303.8	1002.3	2315	2326	
					2843
868	1308.2	1004.9	2316	2327	
					2781
870	1313.4	1008.0	2317	2329	
					2785
872	1318.6	1011.0	2319	2331	
					3645
874	1323.5	1013.9	2320	2333	
					2570
876	1328.4	1016.8	2322	2334	
					2897
878	1334.1	1020.2	2324	2337	

Schlumberger

GEOGRAM+

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2956
880	1340.1	1023.7	2326	2340	
					3409
882	1345.5	1026.9	2328	2342	
					3111
884	1350.7	1029.9	2330	2344	
					3166
886	1355.6	1032.8	2331	2346	
					2958
888	1360.3	1035.6	2332	2347	
					2694
890	1365.2	1038.5	2333	2348	
					2804
892	1370.0	1041.2	2335	2349	
					2874
894	1375.1	1044.1	2336	2350	
					2788
896	1380.2	1047.0	2337	2352	
					2752
898	1385.3	1049.9	2338	2353	
					2707
900	1389.9	1052.5	2339	2354	
					2980
902	1393.9	1054.8	2339	2353	

Schlumberger

GEOGRAM+
Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2498
904	1397.9	1057.0	2339	2353	
					2252
906	1402.7	1059.8	2339	2354	
					2429
908	1407.8	1062.7	2341	2356	
					2841
910	1412.9	1065.6	2342	2357	
					2865
912	1417.7	1068.3	2343	2358	
					2817
914	1423.1	1071.4	2344	2360	
					2846
916	1427.9	1074.1	2345	2361	
					2850
918	1433.3	1077.2	2347	2362	
					2925
920	1438.6	1080.2	2348	2364	
					2990
922	1443.4	1083.0	2349	2365	
					2719
924	1448.5	1085.8	2350	2366	
					2719
926	1453.7	1088.7	2351	2367	

Schlumberger

GEOGRAM+
Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					3064
928	1458.6	1091.5	2352	2368	
					2902
930	1463.8	1094.4	2353	2370	
					2865
932	1468.5	1097.0	2354	2370	
					2654
934	1473.1	1099.6	2355	2371	
					2602
936	1477.8	1102.2	2355	2371	
					2509
938	1482.5	1104.7	2355	2371	
					2588
940	1486.9	1107.2	2356	2372	
					2570
942	1491.6	1109.8	2356	2372	
					2527
944	1496.4	1112.4	2357	2373	
					2625
946	1501.1	1115.0	2357	2373	
					2554
948	1505.9	1117.5	2358	2374	
					2549
950	1510.7	1120.1	2358	2374	

Schlumberger

GEOGRAM+

Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2580
952	1515.4	1122.7	2359	2375	
					2609
954	1520.2	1125.3	2359	2375	
					2571
956	1525.0	1127.9	2360	2376	
					2662
958	1530.1	1130.7	2360	2376	
					2600
960	1535.0	1133.2	2361	2377	
					2598
962	1539.8	1135.8	2361	2377	
					2656
964	1544.6	1138.4	2362	2378	
					2633
966	1550.0	1141.3	2363	2379	
					2677
968	1555.2	1144.1	2364	2380	
					2821
970	1560.6	1147.0	2365	2381	
					3186
972	1565.7	1149.7	2366	2382	
					2727
974	1570.9	1152.4	2366	2382	

Schlumberger

GEOGRAM+
Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					2833
976	1575.7	1155.0	2367	2383	
					2669
978	1581.2	1157.9	2368	2384	
					2721
980	1587.8	1161.4	2370	2387	
					3668
982	1594.1	1164.8	2372	2390	
					3425
984	1600.8	1168.3	2375	2392	
					3500
986	1607.6	1171.8	2377	2395	
					3483
988	1614.0	1175.2	2379	2397	
					3366
990	1620.8	1178.7	2381	2400	
					3423
992	1627.2	1182.0	2383	2402	
					3358
994	1634.0	1185.5	2385	2405	
					3310
996	1640.8	1189.0	2388	2408	
					3539
998	1648.0	1192.7	2390	2411	

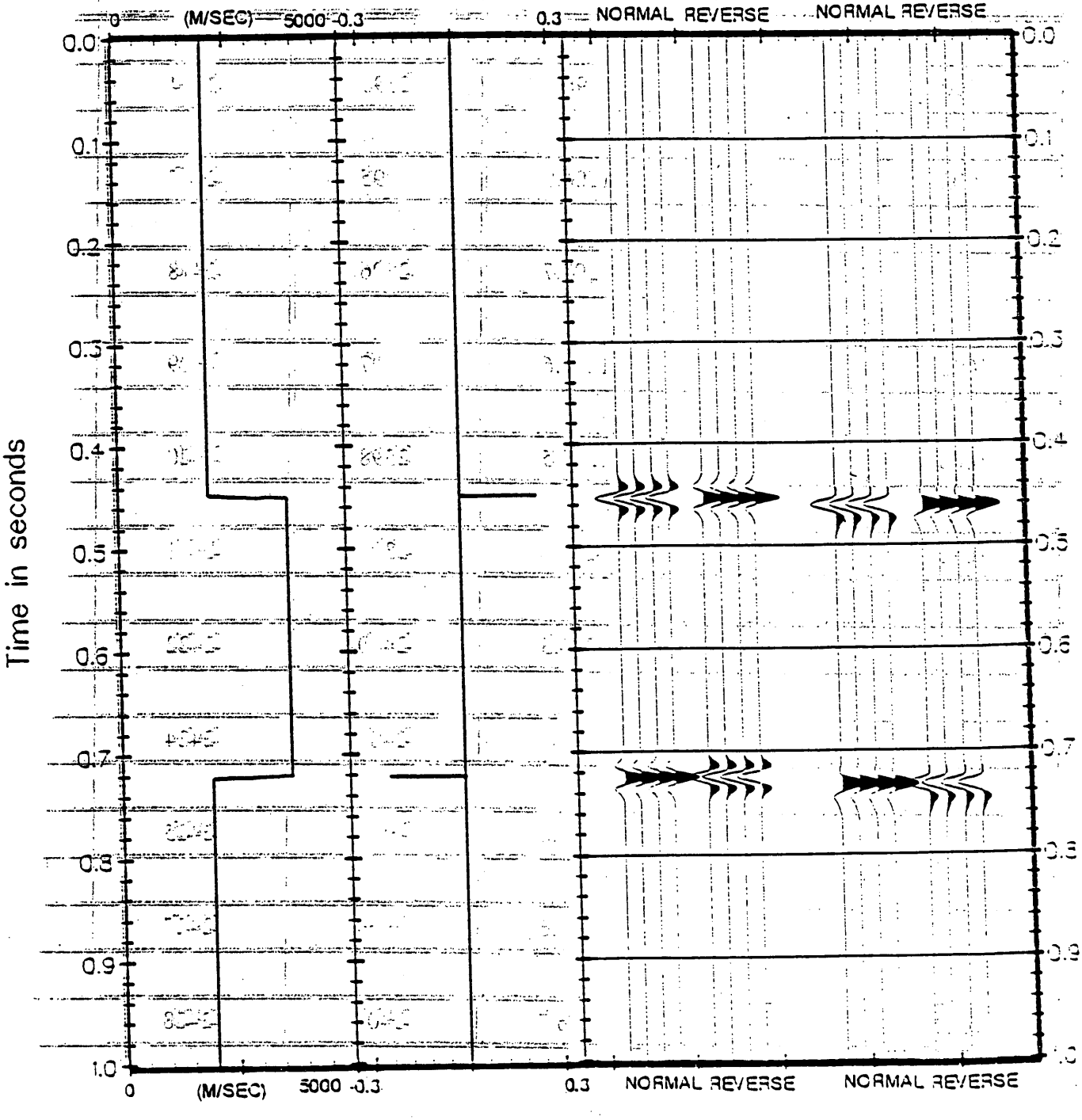
Schlumberger

GEOGRAM+
Velocity Report

Velocity Data (Continued)

TWO WAY TRAVEL TIME FROM SRD ms	MEASURED DEPTH FROM KB m	VERTICAL DEPTH FROM SRD m	AVERAGE VELOCITY SRD/GEO m/s	RMS VELOCITY m/s	INTERVAL VELOCITY m/s
					3886
1000	1655.3	1196.3	2393	2414	
					3622
1002	1662.5	1200.0	2395	2417	
					3655
1004		1202.7	2396	2418	
					2816
1006		1205.6	2397	2419	
					2537
1008		1208.5	2398	2420	
					2723
1010		1211.4	2399	2421	
					3044
1012		1214.3	2400	2422	
					2952
1014		1217.5	2401	2424	
					3180
1016		1220.6	2403	2425	
					3026
1018		1223.6	2404	2427	
					2822
1020		1226.7	2405	2428	

SCHLUMBERGER (SEG-1976) WAVELET POLARITY CONVENTION



PE908216

This is an enclosure indicator page.
The enclosure PE908216 is enclosed within the container PE908215 at this location in this document.

The enclosure PE908216 has the following characteristics:

ITEM_BARCODE	PE908216
CONTAINER_BARCODE	PE908215
NAME	Iona-5 Vertical Seismic Profile Plot
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	SYNTH_SEISMOGRAM
DESCRIPTION	Iona-5 Vertical Seismic Profile Plot, Z-Axis Processing Steps, Z Median Stack, Appendix 4, Plot 1 of Iona-5 Well Completion Report
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-5
CONTRACTOR	Western Underground Gas Storage Pty Ltd
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	
BOTTOM_DEPTH	
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE908217

This is an enclosure indicator page.
The enclosure PE908217 is enclosed within the container PE908215 at this location in this document.

The enclosure PE908217 has the following characteristics:

ITEM_BARCODE	PE908217
CONTAINER_BARCODE	PE908215
NAME	Iona-5 Vertical Seismic Profile Plot
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	SYNTH_SEISMOGRAM
DESCRIPTION	Iona-5 Vertical Seismic Profile Plot, Composite Display, Normal Polarity, Appendix 4, Plot 2 Of Iona-5 Well Completion Report
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-5
CONTRACTOR	Western Underground Gas Storage Pty Ltd
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	
BOTTOM_DEPTH	
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE908218

This is an enclosure indicator page.
The enclosure PE908218 is enclosed within the container PE908215 at this location in this document.

The enclosure PE908218 has the following characteristics:

ITEM_BARCODE	PE908218
CONTAINER_BARCODE	PE908215
NAME	Iona-5 Vertical Seismic Profile Plot
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	SYNTH_SEISMOGRAM
DESCRIPTION	Iona-5 Vertical Seismic Profile Plot, Composite Display, Reversed Polarity, Appendix 4, Plot 3 of Iona-5 Well Completion Report
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-5
CONTRACTOR	Western Underground Gas Storage Pty Ltd
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	
BOTTOM_DEPTH	
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE908219

This is an enclosure indicator page.
The enclosure PE908219 is enclosed within the container PE908215 at this location in this document.

The enclosure PE908219 has the following characteristics:

ITEM_BARCODE	PE908219
CONTAINER_BARCODE	PE908215
NAME	Iona-5 Check Shot Survey
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	VELOCITY_CHART
DESCRIPTION	Iona-5 Check Shot Survey, Velocity Cross Plot, Appendix 4, Plot 4 of Iona-5 Well Completion Report
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-5
CONTRACTOR	Western Underground Gas Storage Pty Ltd
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	
BOTTOM_DEPTH	
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE606111

This is an enclosure indicator page.
The enclosure PE606111 is enclosed within the container PE908215 at this location in this document.

The enclosure PE606111 has the following characteristics:

ITEM_BARCODE	PE606111
CONTAINER_BARCODE	PE908215
NAME	Iona-5 Field Log
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	WELL_LOG
DESCRIPTION	Iona-5 Drift Corrected Sonic, Platform Express-BHC, Appendix 4, Plot 5 of Iona-5 Well Completion Report
REMARKS	
DATE_WRITTEN	07-MAY-1999
DATE_PROCESSED	30-JUL-1999
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-5
CONTRACTOR	Western Underground Gas Storage Pty Ltd
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	
BOTTOM_DEPTH	
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE908220

This is an enclosure indicator page.
The enclosure PE908220 is enclosed within the container PE908215 at this location in this document.

The enclosure PE908220 has the following characteristics:

ITEM_BARCODE	PE908220
CONTAINER_BARCODE	PE908215
NAME	Iona-5 Vertical Seismic Profile
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	WELL_LOG
DESCRIPTION	Iona-5 Vertical Seismic Profile, Composite Display, Normal Polarity, Appendix 4, Plot 6 of Iona-5 Well Completion Report
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-5
CONTRACTOR	Western Underground Gas Storage Pty Ltd
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	
BOTTOM_DEPTH	
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE908221

This is an enclosure indicator page.
The enclosure PE908221 is enclosed within the container PE908215 at this location in this document.

The enclosure PE908221 has the following characteristics:

ITEM_BARCODE	PE908221
CONTAINER_BARCODE	PE908215
NAME	Iona-5 Vertical Seismic Profile
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	WELL_LOG
DESCRIPTION	Iona-5 Vertical Seismic Profile, Composite Display, Reversed Polarity, Appendix 4, Plot 7 of Iona-5 Well Completion Report
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-5
CONTRACTOR	Western Underground Gas Storage Pty Ltd
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	
BOTTOM_DEPTH	
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE606112

This is an enclosure indicator page.
The enclosure PE606112 is enclosed within the container PE908215 at this location in this document.

The enclosure PE606112 has the following characteristics:

ITEM_BARCODE	PE606112
CONTAINER_BARCODE	PE908215
NAME	Iona-5 Well Log
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	WELL_LOG
DESCRIPTION	Iona-5 Quality Control Recomputed Sonic Log, Appendix 4, Plot 8 of Iona-5 Well Completion Report
REMARKS	
DATE_WRITTEN	07-MAY-1999
DATE_PROCESSED	18-MAY-1999
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-5
CONTRACTOR	Western Underground Gas Storage Pty Ltd
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	
BOTTOM_DEPTH	
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

APPENDIX 5

Test report by Haliburton

WELL TEST DATA REPORT

COMPANY : WESTERN UNDERGROUND GAS STORAGE PTY LTD

WELL : IONA 5

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

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.

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

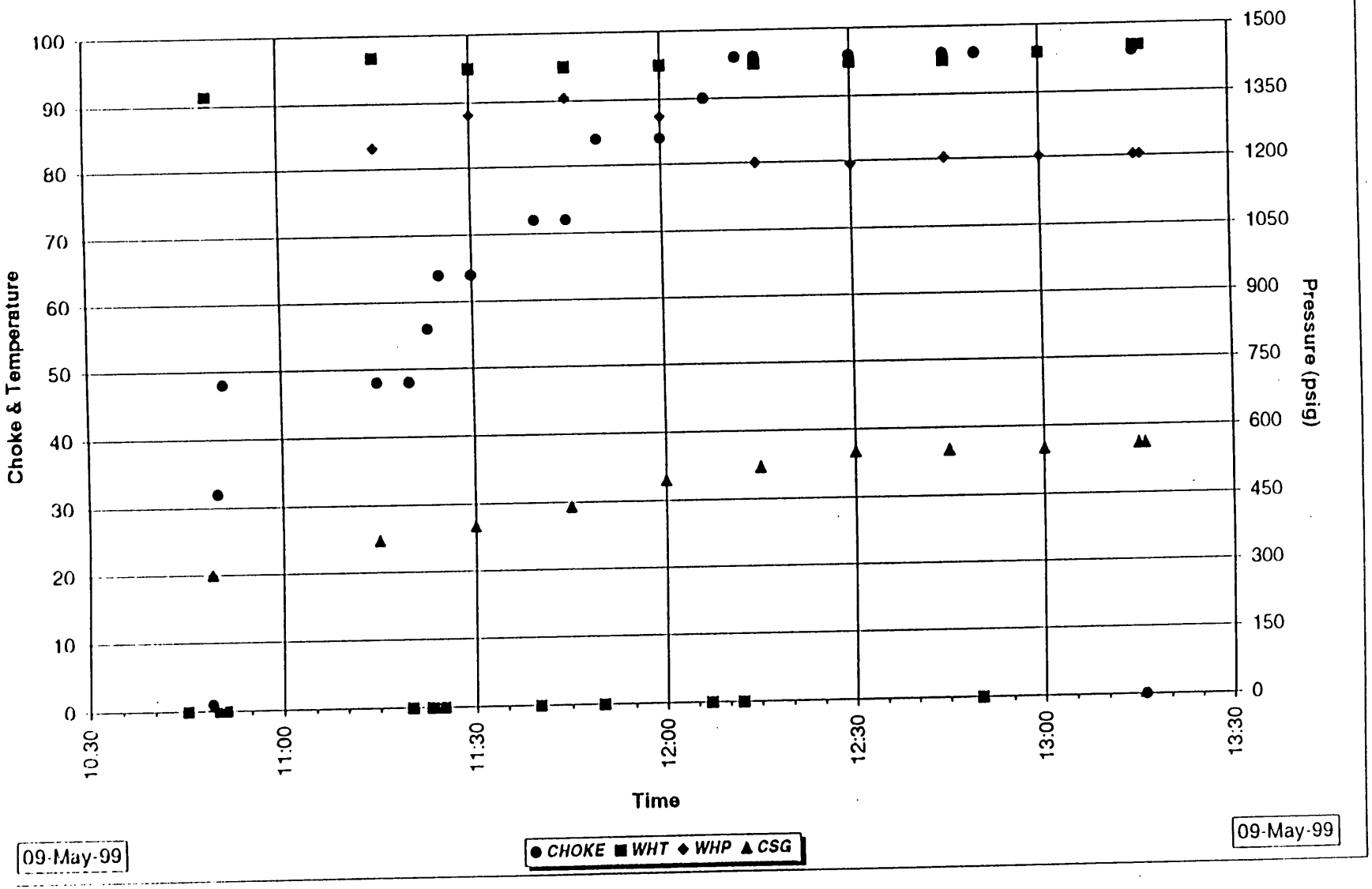
FLOWLINE - PRODUCTION TREE TO CHOKE MANIFOLD

IONA - 4 & 5 COMPLETION/CLEANUP PROGRAM

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

HALLIBURTON

Western Underground Gas Storage Iona - 5 Completion & Cleanup



Wellhead Plot

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

CUSTO : Western Underground Gas Stor
WELL NAME : Iona - 5
DATE : 9th May 10:45 - 9th May 13:16
RIG : ODE #30

PERFORATION INTERVAL : 1582.0 - 1593.0 15. 1602.0m KB
TEST No. : Completion & Cleanup
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	UPSTREAM CHOKE		WELLHEAD PRESSURES						Separator - Rates & Pressures				CUMMULATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	Press	WHT	CSG	Iona 5 THP	D/Stream Pressure	D/Stream Temp	Gas Rate	COND	PRESS	TEMP	GAS	OIL	WATER	OIL	GAS	**Gas Rates are estimated only - using choke nipple Coefficient
(dd mmm hh mm)	(64ths)	(%)	(psig)	(°F)	(psig)	(psig)	(64ths)	(°F)	(MMscf/d)	(stb/d)	(psig)	(°f)	(MMscf)	(stb)	(bbls)	(API@60°f)	(Air=1)	
09-May 10:45																		Dropped bar to fire T.C.P guns
09-May 10:49	1		300.0	91.4	300.0				13.72								0.684	Pressure increase observed - indication guns fired
09-May 10:50	32																	Opened well on 32/64" adjustable choke to flare
09-May 10:51	48																	Increased choke to 48/64" adjustable
09-May 11:15	48		1247.0	96.8	370.0		160	89.6	14.18								0.684	
09-May 11:20	48																	CO_2 = 6.0% H_2S = 0 ppm
09-May 11:23	56																	Increased choke to 56/64" adjustable
09-May 11:25	64																	Increased choke to 64/64" adjustable
09-May 11:30	64	99.9	1321.0	95.0	400.0	1417.0	350	68.0	26.76								0.684	BS&W = 99.0% H_2O and 1.0% condensate with a trace of sediment
09-May 11:40	72																	Increased choke to 72/64" adjustable
09-May 11:45	72		1356.0	95.0	440.0	1449.0	445	53.6	34.76								0.684	
09-May 11:50	84																	Increased choke to 84/64" adjustable
09-May 12:00	84		1310.0	95.0	495.0	1424.0	530	55.4	45.71								0.684	
09-May 12:07	90																	Increased choke to 90/64" adjustable
09-May 12:12	96																	Changed to 96/64" positive choke
09-May 12:15	96		1200.0	95.0	520.0	1384.0	655	62.6	54.69								0.684	
09-May 12:30	96		1194.0	95.0	550.0	1385.0	650	64.4	54.41								0.684	
09-May 12:45	96		1203.0	95.0	550.0	1388.0	640	68.0	54.82								0.684	
09-May 12:50	96																	CO_2 = 4.0% H_2S = 0 ppm
09-May 13:00	96		1203.0	95.9	550.0	1388.0	640	68.0	54.78								0.684	

HALLIBURTON

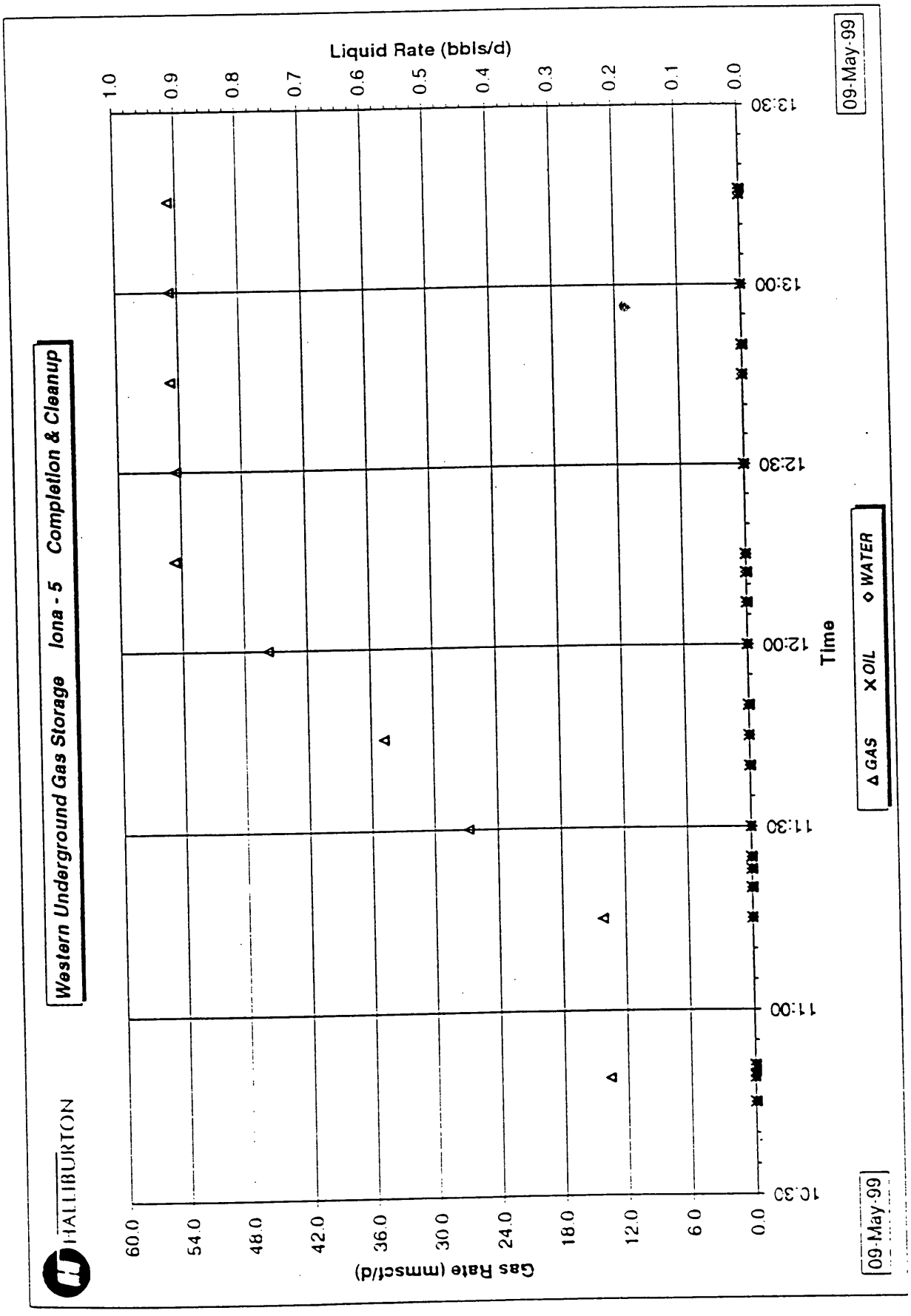
WELL TEST DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 5
DATE : 9th May 10:45 - 9th May 13:16
RIG : ODE #30

PERFORATION INTERVAL : 1582.0 - 1593.0 1602.0m KB
TEST No. : Completion & Cleanup
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Dylan Richards

DATE & TIME	UPSTREAM CHOKE				WELLHEAD PRESSURES				Separator - Rates & Pressures				CUMMULATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	Press	WHT	CSG	Iona 5 THP	D/Stream Pressure	D/Stream Temp	Gas Rate	COND	PRESS	TEMP	GAS	OIL	WATER	OIL	GAS	
(dd-mmm hh:mm)	(64ths)	(%)	(psig)	(°F)	(psig)	(psig)	(64ths)	(°F)	(MMscf/d)	(stb/d)	(psig)	(°f)	(MMscf)	(stb)	(bbls)	(API@60°f)	(Air=1)	**Gas Rates are estimated only - using choke nipple Coefficient
																	0.684	
09-May 13:15	96		1204.0	96.8	560.0	1388.0	640	68.0	54.78									Shut well in at choke manifold - End of Test
09-May 13:16			1204.0	96.8	560.0	1388.0	640	68.0										



Production Plot

INDEX

IONA - 4 & 5 COMPLETION/CLEANUP PROGRAM

IONA - 4

IONA - 5

HALLIBURTON

WELL TEST DATA SHEET

BASE: Australia

CUSTOMER : Western Underground Gas Storage
WELL NAME : Iona - 5
DATE : 28th May 13:45 - 28th May 15:31
RIG :

PERFORATION INTERVAL : 1582.0 - 1593.0 1598.0 - 1602.0m KB
TEST No. : Tree Installation & Cleanup Flow
CUSTOMER REP. : Rob Viner
HES SUPERVISOR : Michael Hodge

DATE & TIME	UPSTREAM CHOKE				WELLHEAD PRESSURES				Separator - Rates & Pressures				CUMMULATIVE			SPECIFIC GRAVITY		REMARKS
	SIZE	BS&W	Press	WHT	CSG	Iona 5 THP	D/Stream Pressure	D/Stream Temp	Gas Rate	COND	PRESS	TEMP	GAS	OIL	WATER	OIL	GAS	**Gas Rates are estimated only - using choke nipple Coefficient
(dd mmm hh mm)	(64ths)	(%)	(psig)	(°F)	(psig)	(psig)	(psig)	(°F)	(MMscf/d)	(stb/d)	(psig)	(°f)	(MMscf)	(stb)	(bbls)	(API@60°f)	(Air=1)	
28 May 13 45																		Open well up to closed choke manifold
28 May 13 50	32																	Opened well to flare on 32/64" adjustable
28 May 13 51	40																	Increased choke to 40/64" adjustable
28 May 13 52	40																	Commenced injecting methanol
28 May 13 53	40		745 0															
28 May 13 55	48																	Increased choke to 48/64" adjustable
28 May 14 00	48		895 0	77 0	275.0	858.0	80	77.0	10.37								0.684	
28 May 14 01	48																	Gas to surface
28 May 14 15	48		1390 0	86 0	375.0	1410.0	210	48.2	15.97								0.684	
28 May 14 17	64																	
28 May 14 30	64		1348 0	86 0	490.0	1426.0	350	48.2	27.53								0.684	
28 May 14 45	64		1385 0	86 0	560.0	1443.0	360	37.4	28.28								0.684	
28 May 15 00	64		1393 0	89 6	610 0	1448.0	330	35.6	28.35								0.684	
28 May 15 15	64		1398 0	89 6	670 0	1448.0	330	35.6	28.45								0.684	
28 May 15 30	64		1397 0	91 4	695.0	1540.0	330	35.6	28.39								0.684	
28 May 15 31																		S.W.I - End of clean-up/flowback

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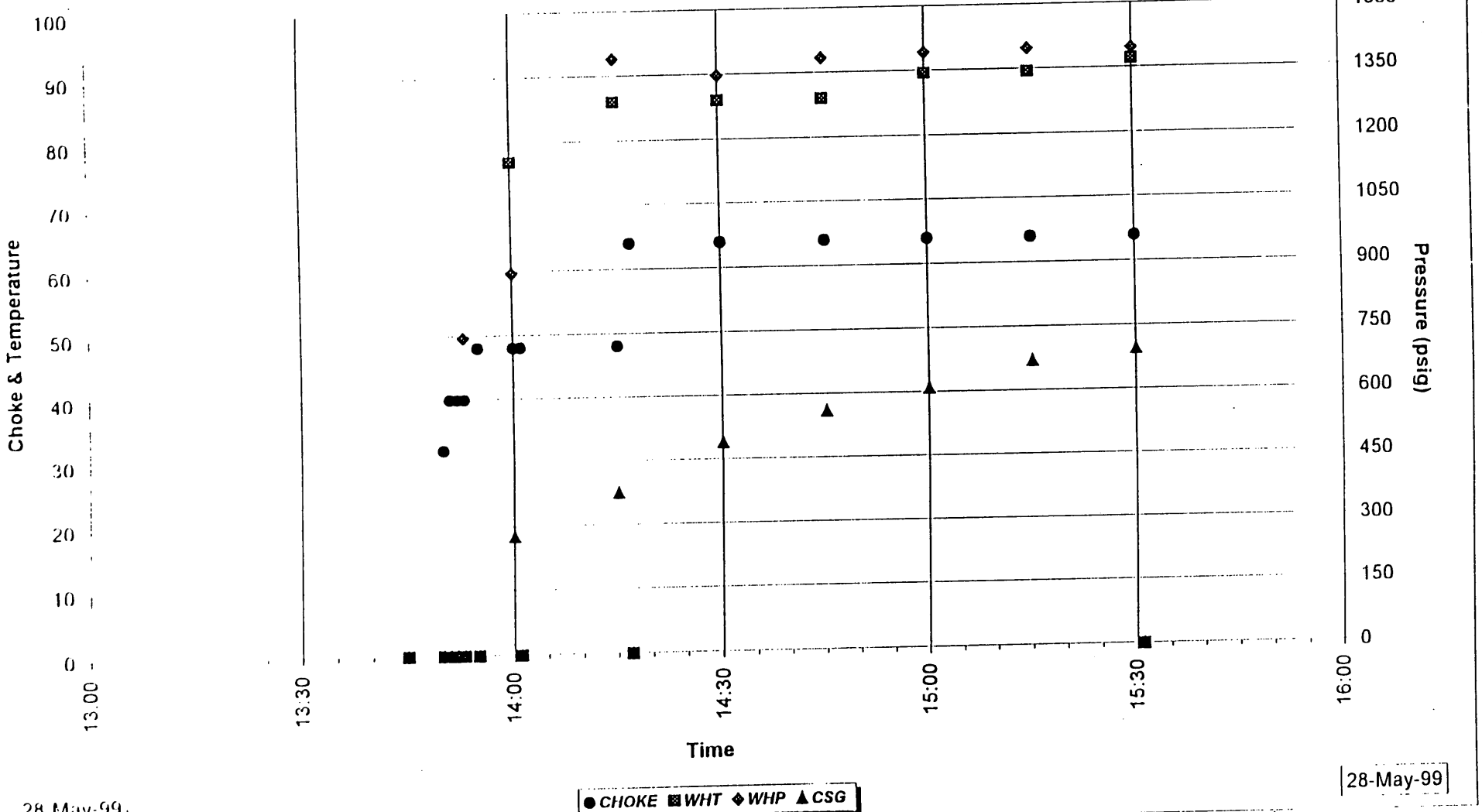
HALLIBURTON

Western Underground Gas Storage Iona - 5 Tree Installation & Cleanup Flow



28 May-99

Wellhead Plot

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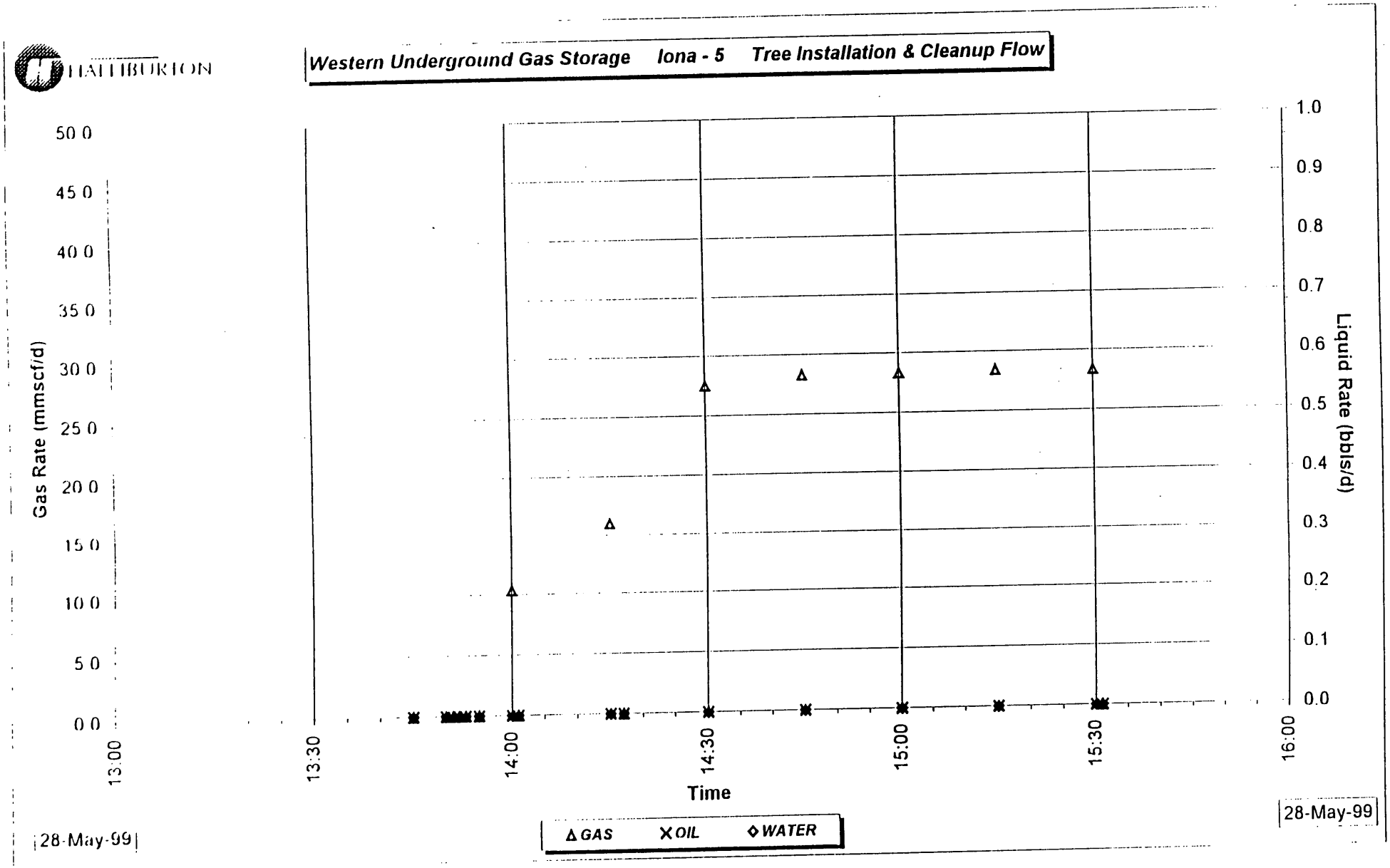
HALLIBURTON



Production Plot

HALLIBURTON ENERGY SERVICES

PRODUCTION TEST DETAIL REPORT
SEQUENCE OF OPERATIONS

CUSTOMER : Western Underground Gas Storage
EST No. : Completion & Cleanup
WELL : Iona - 5
RIG NAME : ODE #30

DATE	TIME	OPERATIONS
09-May-99	0:30	Laid down slick-line lubricator/BOP
09-May-99	0:45	Landed tubing hanger with tubing in 15000# compression
09-May-99	0:45	Screwed in tie down screws
09-May-99	2:00	Made up test tree adapter flange to landing joint and nippled up test tree
09-May-99	2:30	Pressure tested (test) tree adapter flange and tubing against plug in XN nipple
09-May-99	2:35	Rigged up slickline and R.I.H and retrieved 3.813" XXN plug from XN nipple
09-May-99	3:45	O.O.H - plug retrieved OK
09-May-99	3:50	Pressure tested annulus to 2000 psi for 10 minutes - OK
09-May-99	4:15	Rigged up Coflexip hoses from test tree to choke manifold
09-May-99	5:30	Pressure tested Coflexip hoses to 2000 psi - OK
09-May-99	5:45	Pressure tested gas flare line to 1500 psi - OK
09-May-99	6:00	R.I.H with slickline to open S.S.D
09-May-99	7:45	O.O.H - S.S.D opened OK
09-May-99	7:45	Changed out slickline toolstring. Commenced displacing 41 bbls brine from tubing
09-May-99	7:45	to trip tank via annulus with Nitrogen
09-May-99	9:00	Finished displacing brine - R.I.H with slickline to close S.S.D
09-May-99	10:00	O.O.H - S.S.D closed OK
09-May-99	10:00	Bled tubing to 0 psi - rigged up 3.813" XXN plug and T.C.P bar in lubricator
09-May-99	10:40	Held pre test Safety meeting
09-May-99	10:45	Dropped bar to fire T.C.P guns
09-May-99	10:49	Pressure increase observed - indication guns fired
09-May-99	10:50	Opened well on 32/64" adjustable choke to flare
09-May-99	10:51	Increased choke to 48/64" adjustable
09-May-99	11:00	Still flowing brine to surface
09-May-99	11:12	Gas to surface
09-May-99	11:20	CO2 = 6.0% H2S = 0 ppm
09-May-99	11:23	Increased choke to 56/64" adjustable
09-May-99	11:25	Increased choke to 64/64" adjustable
09-May-99	11:30	BS&W = 99.0% H2O and 1.0% condensate with a trace of sediment
09-May-99	11:40	Increased choke to 72/64" adjustable
09-May-99	11:50	Increased choke to 84/64" adjustable

HALLIBURTON ENERGY SERVICES

PRODUCTION TEST DETAIL REPORT
SEQUENCE OF OPERATIONS

CUSTOMER : Western Underground Gas Storage
TEST No. : Completion & Cleanup
WELL : Iona - 5
RIG NAME : ODE #30

DATE	TIME	OPERATIONS
09-May-99	12:07	Increased choke to 90/64" adjustable
09-May-99	12:12	Changed to 96/64" positive choke
09-May-99	12:50	CO2 = 4.0% H2S = 0 ppm
09-May-99	13:16	Shut well in at choke manifold - End of Test
09-May-99	13:20	Final gas rate = 54.77 mmscf/d (Estimated rate across choke - using nipple
09-May-99	13:20	- coefficients only. Assumes gas gravity = 0.684 (from previous tests.)
09-May-99	13:30	R.I.H and set 3.813" XXN plug in XN nipple @ 1551.65m RKB
09-May-99	14:20	Bled down tubing from SITHP of 1500psi to 1000 psi
09-May-99	14:45	and inflow tested XXN test plug - OK
09-May-99	15:00	Slickline rigged down
09-May-99	15:15	Killed well by lubricating 200 bbls of inhibited brine to tubing
09-May-99	18:30	Flow checked well OK. SITHP = 0 psi
09-May-99	19:30	Finished rigging down test tree, choke manifold and lines
09-May-99	20:00	Finished installing B.P.V in tubing hanger - commenced rigging down BOP

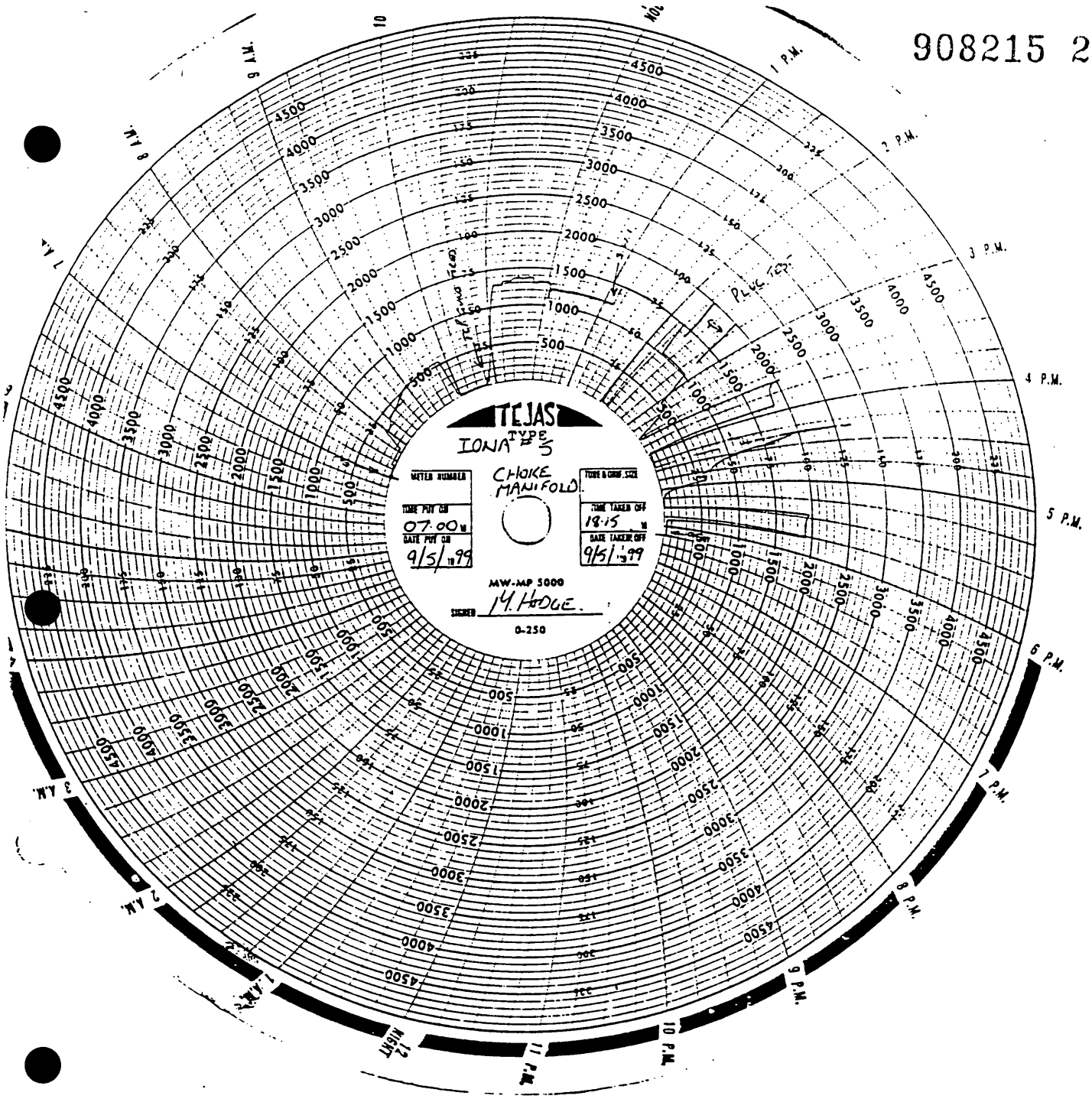
HALLIBURTON ENERGY SERVICES

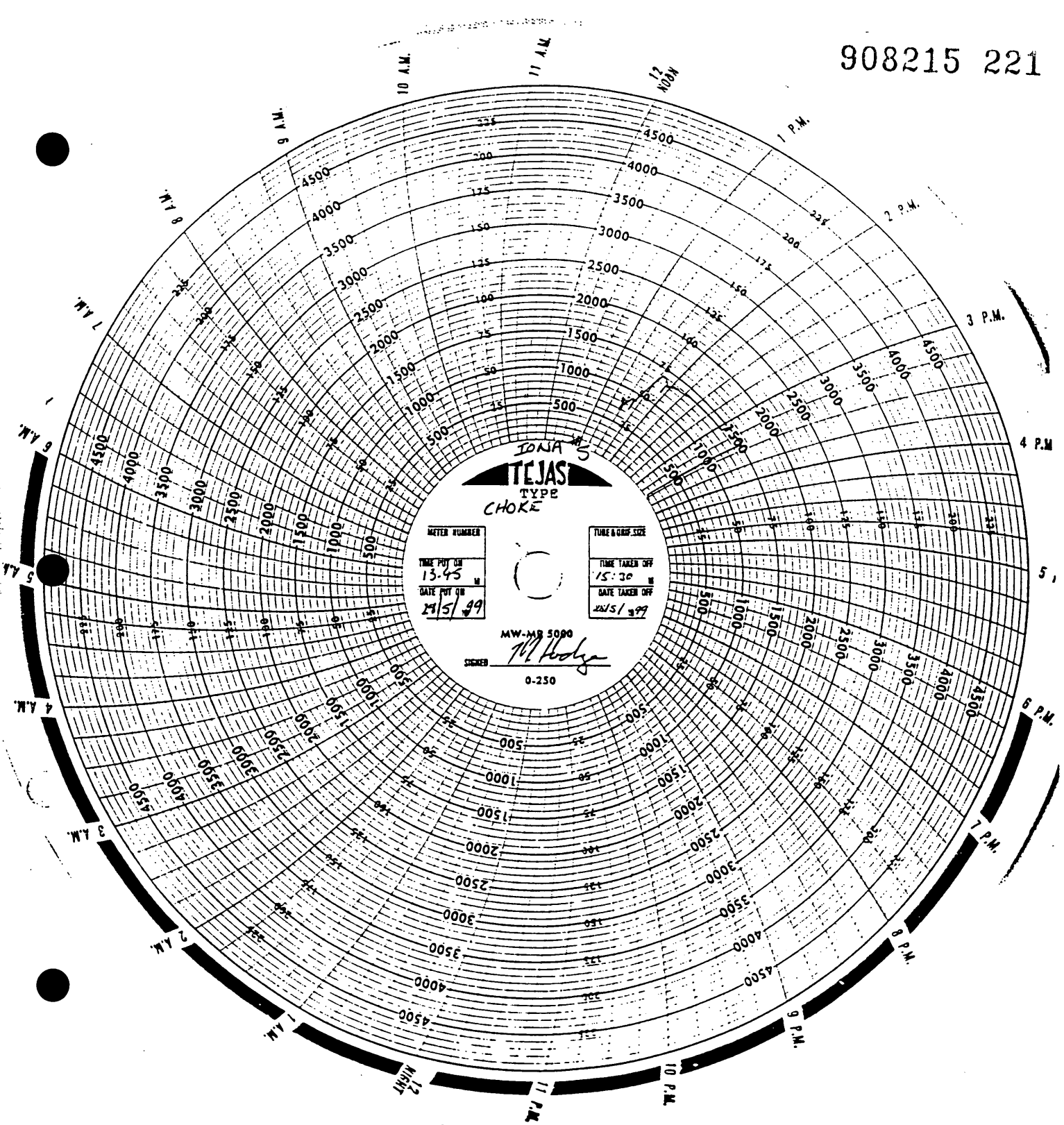
PRODUCTION TEST DETAIL REPORT
SEQUENCE OF OPERATIONS

CUSTOMER : Western Underground Gas Storage
TEST No. : Tree Installation & Cleanup Flow
WELL : Iona - 5
RIG NAME :

DATE	TIME	OPERATIONS
28-May-99	13:45	Open well up to closed choke manifold
28-May-99	13:50	Opened well to flare on 32/64" adjustable
28-May-99	13:51	Increased choke to 40/64" adjustable
28-May-99	13:52	Commenced injecting methanol
28-May-99	13:55	Increased choke to 48/64" adjustable
28-May-99	14:01	Gas to surface
28-May-99	14:17	Increased choke to 64/64" adjustable
28-May-99	15:31	S.W.I - End of clean-up/flowback

908215 220

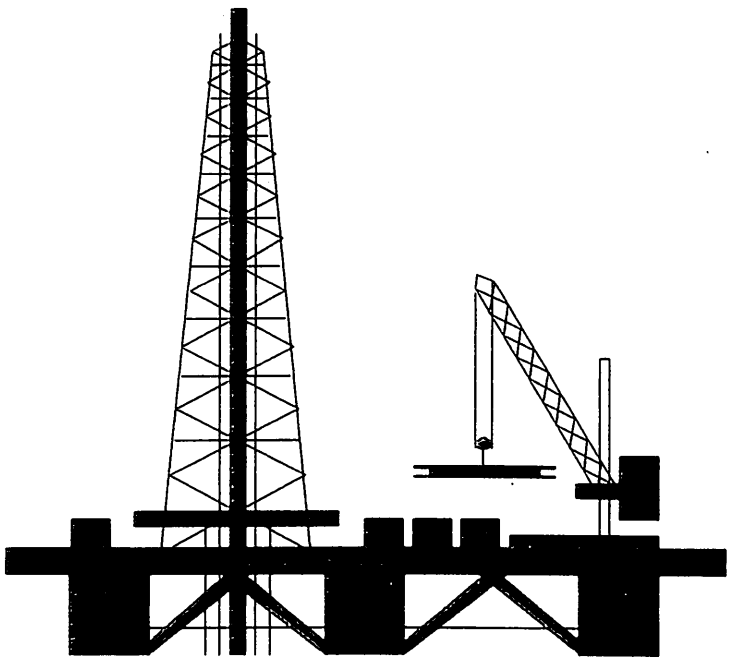

TEJAS
IONA TYPE #5
CHOKE MANIFOLD
METER NUMBER
TIME PUT ON
07.00 M
DATE PUT ON
9/5/1999
TIME TAKEN OFF
18.15 M
DATE TAKEN OFF
9/5/1999
MW-MP 5000
SIGNED M. HODGE.
0-250
PLUG
1 P.M.
2 P.M.
3 P.M.
4 P.M.
5 P.M.
6 P.M.
7 P.M.
8 P.M.
9 P.M.
10 P.M.
11 P.M.
12 NIGHT
1 A.M.
2 A.M.
3 A.M.
4 A.M.
5 A.M.
6 A.M.
7 A.M.
8 A.M.
9 A.M.
10
11
12 NOON


IONA #5
TEJAS
TYPE
CHOKE
METER NUMBER
TIME PUT ON
13.45 M
DATE PUT ON
14/5/99
TUBE & ORIF. SIZE
TIME TAKEN OFF
15:30 M
DATE TAKEN OFF
14/5/99
MW-MB 5000
SIGNED
0-250
12 NOON
1 P.M.
2 P.M.
3 P.M.
4 P.M.
5 P.M.
6 P.M.
7 P.M.
8 P.M.
9 P.M.
10 P.M.
11 P.M.
12 MIDNT
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.
11 A.M.

APPENDIX 6

Directional Drilling end of well report by Sperry Sun

WESTERN UNDERGROUND GAS STORAGE PTY. LTD.



DIRECTIONAL DRILLING END OF WELL REPORT

WELL : IONA #5 ST1

sperry-sun
DRILLING SERVICES

WESTERN UNDERGROUND GAS STORAGE PTY. LTD.

WELL : IONA #5 ST1

TABLE OF CONTENTS

Customer : **Western Underground Gas Storage Pty. Ltd.**

Well : **Iona #5 ST1**

Job Objectives:

The objective of this well is to drill a bore hole to investigate in a 263° of azimuth drirection. The well bore will be logged, then the original well bore will be side tracked to 236° of azimuth direction.

The first well bore will be drilled to 55° inclination and then a tangent section will be drilled to intersect the Waarre C1 abn C2 sands. The second well bore will be drilleed to 32.5° inclination and a tangent section to the Waarre C1 and C2 sands..

Summary of Results:

The job went well. The Geological objectives were met within +/- 4m. The target sands came inapproximately 20m higher than expected.

Usage of tricone bits is reccommended for use on future well for building the curve. Any concern about having adverse left hand turn with PDC bits should laid to rest, since the PDC run proved to have 0.2°-0.6°/30m right hand turn only towards the bottom portion of the well.

Conventional rotary assemblies with PDC bits seem to the best option for drilling any future tangent sections. Care should be given to their implementation, since a true hold assembly is difficult to attain. The use of slight building or dropping assemblies would allow the completion of tangent sections without any adverse consquences.

Discussion:

BHA Summary:

BHA #1 (687m to 953m)

This BHA did not attain the 5.5°/30m as initially planned. Due to the soft formation the BHA under performed in build mode until +/- 40 degrees of inclination, from there on the the yield of the BHA was +/- 7°/30m this was required to hit the target.

Due to an MWD failure the BHA was pulled, the motor was laid down and the MWD changed.

BHA #2 (953m to 1287m)

The BHA started building as per plan with and average build rate of 0.5°/30meters. On entering the Skull Creek formation, the ROP dropped off and so did the build up rate. The inclination started to drop due to the increased side cutting action, as a result of the slow ROP. The BHa was pulled to change the bit to a PDC.

BHA #3 (1287m to 1720m).

This BHA was required to build to the Waarre sands. This was accomplished with out any problems.
A sub 0.7m long was put into the BHA below the stabiliser, the idea was to increase the distance the bit and the stabiliser which would in turn increase the BUR of the assembly. The ROP varied between 15m/hr and 60m/hr, the BHA had a reduced BUR in the slower ROP zone as compared to a greater
BUR in the faster ROP zones.

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	2	1	12.250	656	963	656	932	0.7	50.4	184	260	23	5
2	2rr1		12.250	963	1287	932	1127	50.4	52.9	260	263	29	4
3	2		12.250	1287	1720	1127	1364	52.9	60.7	263	266	27	6

Table 1 - BHA Summary

Motor Run Summary:

BHA # 1 (687m to 953m)

This motor performed well and was seen to be strong through out the run.
No incidences of stalling were perceived.
The motor was laid down due hours in excess of 100hrs.

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	/	8.000	12.000		N	6.00	17	7

Table 2 - Motor Run Summary

Bit Run Summary:

BHA # 1 (687m to 953m)

This bit allowed the BHA to be steered without any problems. The BUR was less than expected, and this is thought to be due to soft formation. It is recommemded that this bit be run in similar circumstances on following wells.

BHA #2 (953m to 1287m)

This bit drilled well until the Skull Creek formation. The ROP dropped off significantly here form around 30m/hr to 5m/hr. The bit was pullled due to ROP, and replaced with a PDC bit. On inspection at surface it was graded 2 / 2 / effective / 1/16/ indicating that there was still life in the bit, and although the ROP was slow through the Skull Creek formation, it would have probably finished the well.

BHA #3 (1287m to 1720m).

The run was inconsequential. The bit produced ROPs from 15m/hr to 65m/hr. The run could be described as good. The bit was in very good condition when inspected at surface, and should be graded as NEW. No further comments necessary.

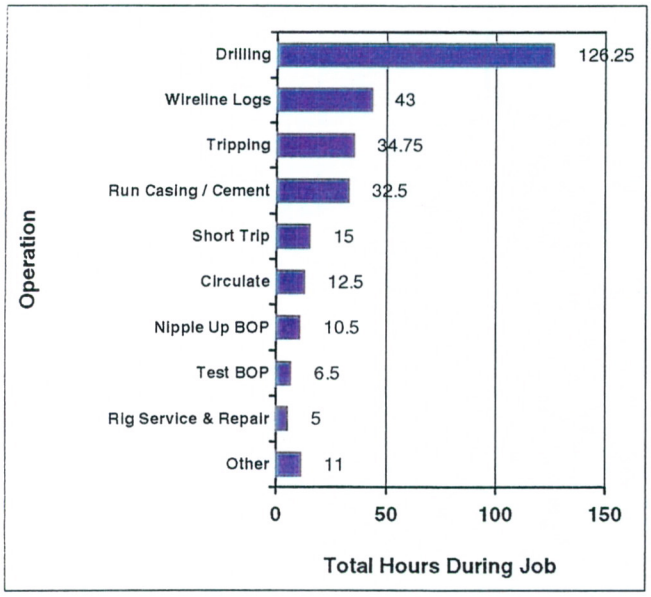
Bit #	Manufacturer	Style	OD (in)	Gge Len (in)	Nozzles (/32's)	TFA (in²)	Dull Grades I O D L B G O R	Ftge (m)	Drlg hrs	ROP (m/hr)
2	Smith	02M	12.250		3x16, 1x12	0.699	1-1- - -E-1- -DTF	307	22.50	14
2rr1	Smith	02m	12.250		3x16, 1x20	0.896	2-2- - -E-1- -ROP	324	29.00	11
2	Security DBS	PDC	12.250		5x18	1.243		433	27.00	16

Table 3 - Bit Run Summary

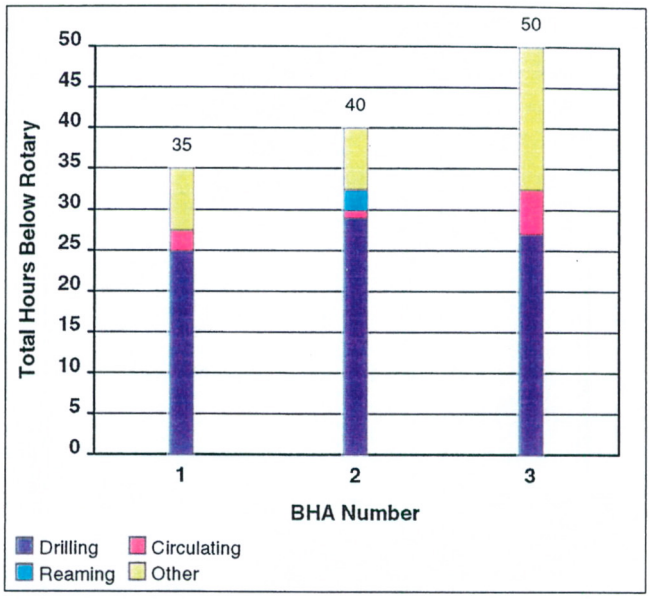
Target TVDs:

The Waarre sands came in approximately 20m higher, this led to the conclusion that the reservoir could be larger than expected. Thus the planned side track of this well bore may not be required.

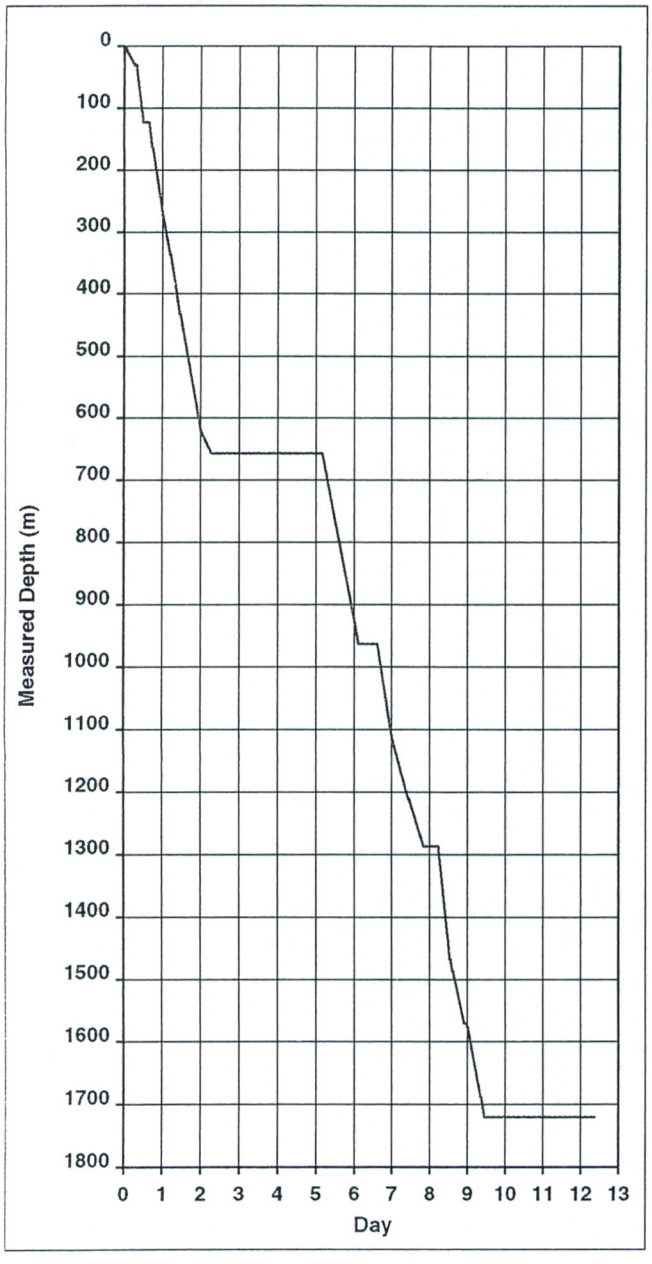
Hours by Operation Summary



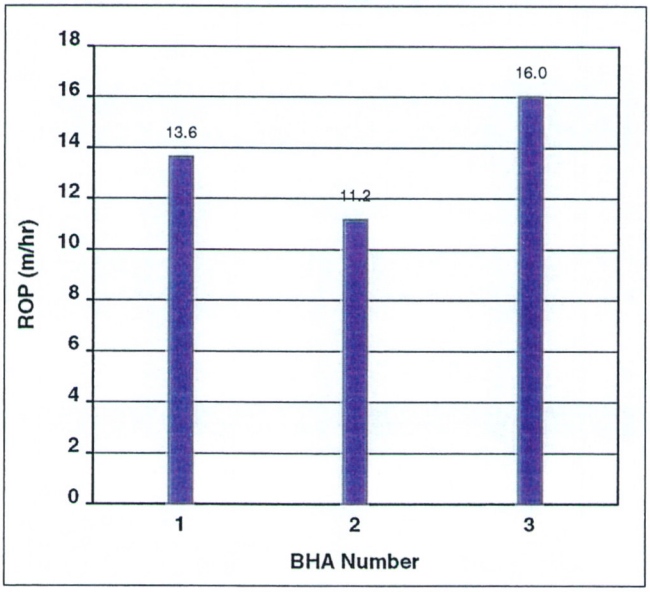
Hours per BHA Breakdown



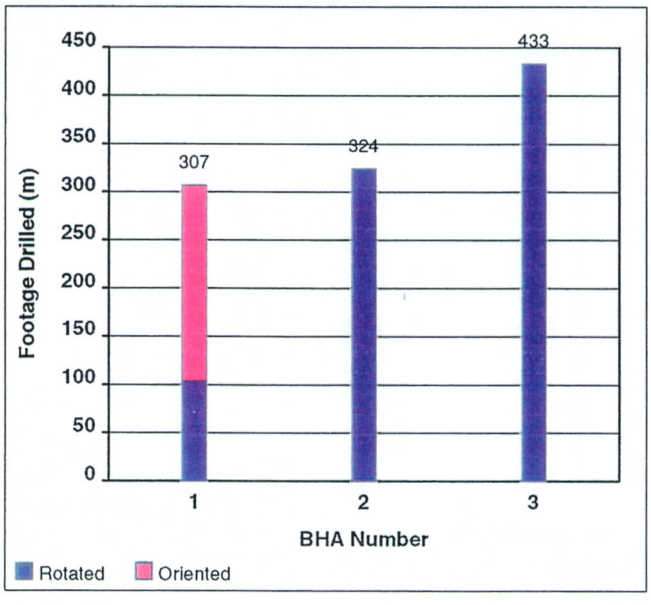
Days vs. Depth



Average Rate of Penetration per BHA



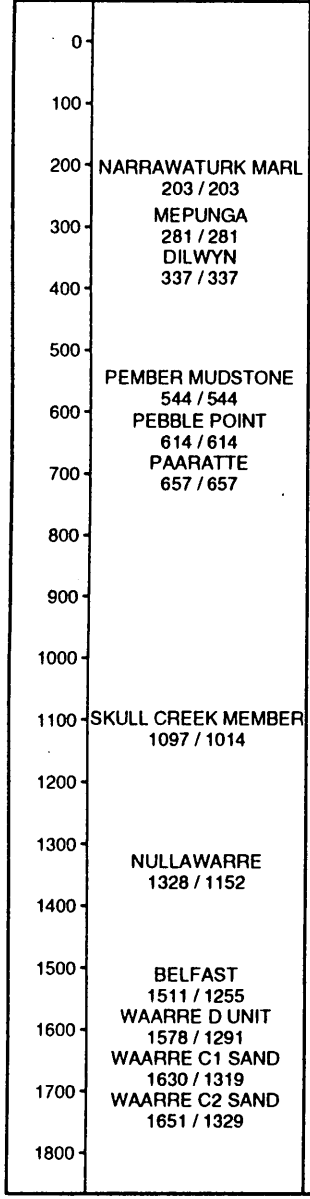
Footage per BHA



Sperry-Sun Drilling Services

Western Underground Gas Storage Pty. Ltd.
Iona #5 ST1
OD&E 30

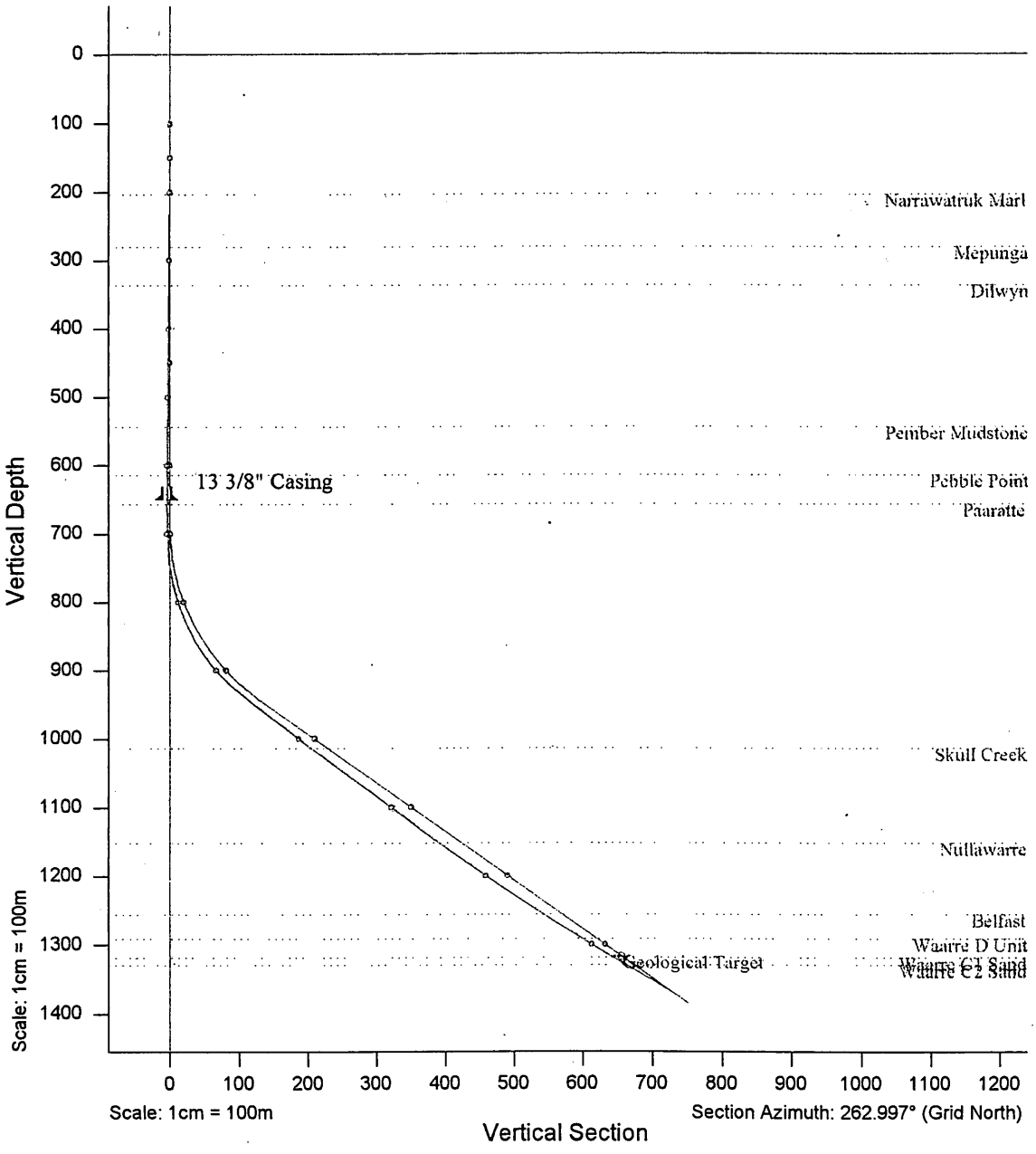
Australia
PPL 2 Otway Basin
VI-DD-90005



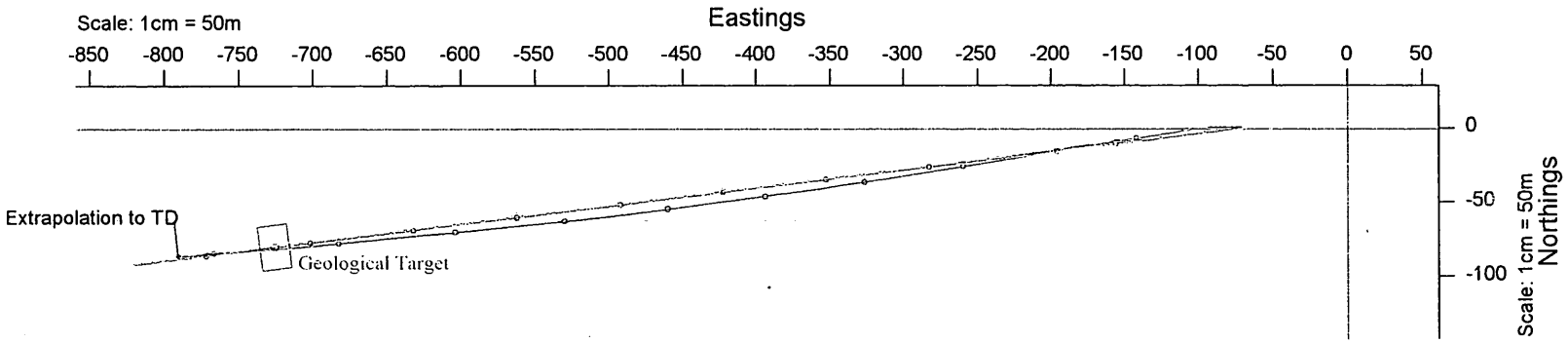
Bit Data	Drilling Parameters	Motor	BHA Stabilizers	Comments	BHA ID
					@ 0
02M 3x16, 1x12 /32's 13.6 m/hr 22.50 hrs	WOB 13 klbs RPM 45 FLO 757 gpm SPP 1778 psi	8" SperryDrill / L BH	12.000 in @ 0.75 m 11.562 in @ 11.19 m		#1 @ 656
02m 3x16, 1x20 /32's 11.2 m/hr 29.00 hrs	WOB 25 klbs RPM 100 FLO 750 gpm SPP 1550 psi		12.250 in @ 1.00 m 11.562 in @ 11.73 m	The goals on this run are to build to the geological objective.	#2 @ 963
PDC 5x18 /32's 16.0 m/hr 27.00 hrs	WOB 10 klbs RPM 100 FLO 800 gpm SPP 2000 psi		12.250 in @ 0.95 m 11.562 in @ 12.33 m	Continue building to the geological objective.	#3 @ 1287

sperry-sun DRILLING SERVICES A HALLIBURTON COMPANY | Western Underground Gas Storage Pty. Ltd. | DrillQuest

Well : Iona #5 ST1



Well : Iona #5 ST1



Current Well Properties	
Well :	Iona #5
Horizontal Coordinates:	
Ref. Global Coordinates :	5728374.14 N, 677279.42 E
Ref. Drillpad Slot #4 :	0.00 N, 75.00 W
Ref. Geographical Coordinates :	38° 34' 31.0317" S, 143° 02' 06.3135" E
RKB Elevation :	134.98m above AHD
Grid North Convergence :	-1.270°
North Reference :	Grid North
Units :	Metres

Sperry-Sun Drilling Services

Survey Report for Iona #5 ST1 : Definitive Gyro Survey

Western Underground Gas Storage Pty. Ltd.
Iona

Iona Drillpad

Measured Depth (m)	Incl.	Azim.	Vertical Depth (m)	Northings (m)	Eastings (m)	Vertical Section (m)	Dogleg Rate (°/30m)
0.00	0.000	0.000	0.00	0.00 N	75.00 W	0.00	
30.00	0.520	181.510	30.00	0.14 S	75.00 W	0.02	0.520
60.00	0.100	225.360	60.00	0.29 S	75.03 W	0.06	0.453
90.00	0.280	113.130	90.00	0.34 S	74.98 W	0.02	0.331
120.00	0.070	322.460	120.00	0.35 S	74.92 W	-0.04	0.343
150.00	0.440	137.850	150.00	0.42 S	74.85 W	-0.09	0.510
180.00	0.280	61.120	180.00	0.47 S	74.71 W	-0.23	0.464
210.00	0.610	45.450	210.00	0.33 S	74.54 W	-0.42	0.349
240.00	0.500	54.180	240.00	0.14 S	74.32 W	-0.66	0.138
270.00	0.310	48.400	270.00	0.01 S	74.15 W	-0.84	0.194
300.00	0.690	47.690	299.99	0.17 N	73.95 W	-1.06	0.380
330.00	0.540	42.880	329.99	0.39 N	73.72 W	-1.31	0.159
360.00	0.410	51.760	359.99	0.56 N	73.54 W	-1.51	0.149
390.00	0.710	59.810	389.99	0.72 N	73.30 W	-1.78	0.309
420.00	0.580	61.770	419.99	0.89 N	73.00 W	-2.09	0.132
450.00	0.440	63.510	449.99	1.01 N	72.77 W	-2.34	0.141
480.00	0.710	73.260	479.99	1.12 N	72.49 W	-2.63	0.286
510.00	0.640	72.130	509.98	1.22 N	72.15 W	-2.98	0.071
540.00	0.480	71.900	539.98	1.31 N	71.87 W	-3.27	0.160
570.00	0.390	83.820	569.98	1.36 N	71.65 W	-3.49	0.127
600.00	0.340	106.600	599.98	1.35 N	71.46 W	-3.68	0.152
630.00	0.350	139.650	629.98	1.25 N	71.32 W	-3.81	0.196
660.00	0.470	151.980	659.98	1.07 N	71.20 W	-3.90	0.148
690.00	0.320	218.540	689.98	0.90 N	71.19 W	-3.89	0.451
720.00	3.770	259.290	719.95	0.65 N	72.22 W	-2.84	3.534
750.00	8.200	269.370	749.78	0.45 N	75.33 W	0.27	4.536
780.00	13.700	269.280	779.23	0.38 N	81.02 W	5.93	5.500
810.00	20.000	269.800	807.92	0.31 N	89.71 W	14.57	6.302
840.00	23.920	265.630	835.74	0.17 S	100.91 W	25.74	4.216
870.00	30.970	260.540	862.35	1.90 S	114.61 W	39.55	7.424
900.00	37.120	261.210	887.20	4.56 S	131.19 W	56.32	6.161
930.00	43.790	261.480	910.02	7.48 S	150.42 W	75.77	6.672
960.00	50.510	260.310	930.41	10.97 S	172.12 W	97.73	6.774
990.00	51.220	260.800	949.34	14.79 S	195.08 W	120.98	0.805
1020.00	51.900	260.730	967.99	18.56 S	218.27 W	144.46	0.682
1050.00	52.450	260.910	986.39	22.34 S	241.66 W	168.14	0.568
1080.00	53.040	260.850	1004.55	26.13 S	265.24 W	192.00	0.592
1110.00	53.620	260.860	1022.47	29.95 S	289.00 W	216.05	0.580
1140.00	53.960	261.280	1040.19	33.71 S	312.91 W	240.24	0.480
1170.00	53.780	261.450	1057.88	37.35 S	336.86 W	264.46	0.226
1200.00	53.770	261.970	1075.61	40.83 S	360.81 W	288.66	0.420
1230.00	53.330	262.260	1093.43	44.15 S	384.71 W	312.79	0.498
1260.00	53.020	262.530	1111.41	47.32 S	408.52 W	336.80	0.378
1290.00	53.060	262.590	1129.45	50.43 S	432.29 W	360.77	0.062
1320.00	53.650	262.700	1147.35	53.51 S	456.16 W	384.84	0.597

Continued...

Sperry-Sun Drilling Services

Survey Report for Iona #5 ST1 : Definitive Gyro Survey

Western Underground Gas Storage Pty. Ltd.
Iona

Iona Drillpad

Measured Depth (m)	Incl.	Azim.	Vertical Depth (m)	Northings (m)	Eastings (m)	Vertical Section (m)	Dogleg Rate (°/30m)
1350.00	54.290	263.070	1165.00	56.51 S	480.23 W	409.10	0.706
1380.00	54.910	263.150	1182.38	59.45 S	504.51 W	433.55	0.623
1410.00	55.530	264.280	1199.49	62.14 S	529.00 W	458.19	1.116
1440.00	55.720	263.880	1216.43	64.70 S	553.63 W	482.95	0.381
1470.00	56.360	264.600	1233.19	67.19 S	578.39 W	507.82	0.875
1500.00	56.940	264.330	1249.68	69.61 S	603.33 W	532.88	0.622
1530.00	57.550	264.640	1265.91	72.04 S	628.44 W	558.10	0.663
1560.00	57.860	264.070	1281.94	74.53 S	653.68 W	583.45	0.573
1590.00	57.940	264.790	1297.88	77.00 S	678.97 W	608.85	0.615
1620.00	58.950	264.880	1313.58	79.30 S	704.43 W	634.41	1.013
1650.00	59.680	265.310	1328.89	81.50 S	730.14 W	660.19	0.818
1680.00	60.060	265.720	1343.95	83.53 S	756.00 W	686.11	0.520
1700.00	60.380	265.280	1353.88	84.89 S	773.31 W	703.45	0.747
1720.00	60.380	265.280	1363.77	86.33 S	790.64 W	720.82	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 -12.205° (11-May-99)

The Dogleg Severity is in Degrees per 30m.
Vertical Section is from Iona #5 Wellhead and calculated along an Azimuth of 262.997° (Grid).

Based upon Minimum Curvature type calculations, at a Measured Depth of 1720.00m.,
The Bottom Hole Displacement is 720.83m., in the Direction of 263.122° (Grid).

Comments

Measured Depth (m)	Station Coordinates TVD (m)	Northings (m)	Eastings (m)	Comment
1720.00	1363.77	86.33 S	790.64 W	Extrapolation to TD

Formation Tops

Measured Depth (m)	Vertical Depth (m)	Sub-Sea Depth (m)	Northings (m)	Eastings (m)	Formation Name
202.97	202.97	67.99	0.37 S	74.59 W	Narrawatruk Marl
280.97	280.96	145.98	0.04 N	74.09 W	Mepunga
336.97	336.96	201.98	0.44 N	73.68 W	Dilwyn
543.97	543.95	408.97	1.32 N	71.84 W	Pember Mudstone
613.97	613.95	478.97	1.32 N	71.39 W	Pebble Point
656.99	656.97	521.99	1.10 N	71.21 W	Paaratte
1095.74	1013.98	879.00	28.13 S	277.68 W	Skull Creek
1327.45	1151.76	1016.78	54.27 S	462.12 W	Nullawarre
1510.61	1255.45	1120.47	70.48 S	612.19 W	Belfast
1577.72	1291.36	1156.38	76.03 S	668.61 W	Waarre D Unit

Continued...

Sperry-Sun Drilling Services

Survey Report for Iona #5 ST1 : Definitive Gyro Survey

Western Underground Gas Storage Pty. Ltd. **Iona Drillpad**
Iona

Measured Depth (m)	Vertical Depth (m)	Sub-Sea Depth (m)	Northings (m)	Eastings (m)	Formation Name
Formation Tops (Continued)					
1629.78	1318.61	1183.63	80.04 S	712.79 W	Waarre C1 Sand
1650.83	1329.31	1194.33	81.56 S	730.85 W	Waarre C2 Sand

Casing details

From		To		
Measured Depth (m)	Vertical Depth (m)	Measured Depth (m)	Vertical Depth (m)	Casing Detail
<Surface>	<Surface>	650.70	650.68	13 3/8" Casing

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DRILLING SERVICES
Survey and Drilling Parameters

Customer : Western Underground Gas Storage Pty. Ltd.
Well : Iona #5 ST1
Rig : OD&E 30

Country : Australia
Lease : PPL 2 Otway Basin
Job # : VI-DD-90005

North Ref : Grid Declination : ° VS Dir : 262.99° (from 0.0N, -75.0E)

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	-75.0	0.00	0.00	0.00										
150.00	0.75	48.00	150.0	-0.8	0.7	-74.3	0.15	0.15	0.00										Tieon
320.00	0.75	40.00	320.0	-2.5	2.3	-72.7	0.02	0.00	0.00										
645.00	0.75	151.00	645.0	-4.9	2.0	-70.3	0.11	0.00	0.00										
696.10	1.70	245.60	696.1	-4.3	1.4	-70.9	1.12	0.56	0.00	10		760	1800	687	696	267m	85	1	
724.50	4.80	264.30	724.4	-2.7	1.1	-72.4	3.42	3.27	19.75	10		760	1800	696	706	267m	85	1	
														716	724	267m		1	
753.10	8.80	271.40	752.8	0.7	1.1	-75.8	4.28	4.20	7.45	10		760	1800	724	744	267m	85	1	
														749	753	30L		1	
781.62	14.30	270.30	780.7	6.3	1.1	-81.5	5.79	5.79	-1.16	10		760	1800	753	782	30L	85	1	
810.12	20.50	270.00	807.9	14.8	1.1	-90.0	6.53	6.53	-0.32	10		760	1800	782	810	30L	85	1	
838.64	24.00	266.50	834.3	25.5	0.8	-100.8	3.94	3.68	-3.68	10		760	1800	810	820	30L	30	1	
														830	839	30L		1	
867.20	30.70	261.30	859.7	38.6	-0.7	-113.8	7.47	7.04	-5.46	10		760	1800	839	867	30L	30	1	
886.20	35.20	261.30	875.6	49.0	-2.2	-124.1	7.11	7.11	0.00	10		760	1800	867	878	30L	35	1	
														884	886	30L		1	
895.70	36.80	261.30	883.3	54.5	-3.1	-129.6	5.05	5.05	0.00	10		760	1800	886	887	30L	35	1	
														894	896	30L		1	
905.20	38.10	261.90	890.8	60.3	-3.9	-135.3	4.26	4.11	1.89	10		760	1800	896	896	30L	35	1	
														903	905	30L		1	
924.20	43.00	262.00	905.3	72.7	-5.6	-147.5	7.74	7.74	0.16	10		760	1800	905	906	30L	35	1	
														915	924	30L		1	
955.09	50.20	260.40	926.5	95.1	-9.1	-169.7	7.08	6.99	-1.55	20	100	750	1550	924	944	30L	20	1	
														954	955	30L		1	
983.59	51.10	260.60	944.5	117.1	-12.7	-191.4	0.96	0.95	0.21	20	100	750	1550				20	2	
1012.12	51.70	260.60	962.3	139.4	-16.4	-213.4	0.63	0.63	0.00	20	100	750	1550				20	2	
1040.60	52.30	260.40	979.9	161.8	-20.1	-235.5	0.65	0.63	-0.21	20	100	750	1550				20	2	
1069.10	52.80	260.50	997.2	184.4	-23.8	-257.9	0.53	0.53	0.11	20	100	750	1550				20	2	
1097.67	53.30	261.10	1014.4	207.2	-27.5	-280.4	0.73	0.53	0.63	20	100	750	1550				20	2	

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DRILLING SERVICES
Survey and Drilling Parameters

Customer : Western Underground Gas Storage Pty. Ltd.
Well : Iona #5 ST1
Rig : OD&E 30

Country : Australia
Lease : PPL 2 Otway Basin
Job # : VI-DD-90005

North Ref : Grid Declination : ° VS Dir : 262.99° (from 0.0N, -75.0E)

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
1126.20	53.70	261.70	1031.4	230.1	-30.9	-303.1	0.66	0.42	0.63	30	100	750	1550				7	2	
1154.00	53.60	261.80	1047.8	252.5	-34.1	-325.2	0.14	-0.11	0.11	30	100	750	1550				7	2	
1183.24	53.80	261.20	1065.1	276.1	-37.6	-348.5	0.54	0.21	-0.62	30	100	750	1550				7	2	
1211.73	53.50	262.30	1082.0	299.0	-40.9	-371.2	0.98	-0.32	1.16	30	100	750	1550				7	2	
1240.23	53.10	262.50	1099.1	321.9	-43.9	-393.9	0.45	-0.42	0.21	30	100	750	1550				7	2	
1268.80	52.80	263.10	1116.3	344.7	-46.8	-416.5	0.59	-0.32	0.63	30	100	750	1550				7	2	
1278.30	52.80	262.80	1122.0	352.2	-47.7	-424.0	0.75	0.00	-0.95	30	100	750	1550				7	2	
1288.50	52.90	263.40	1128.2	360.4	-48.7	-432.1	1.44	0.29	1.76	12	100	800	2000				50	3	
1355.05	54.40	263.60	1167.6	414.0	-54.7	-485.3	0.68	0.68	0.09	12	100	800	2000				50	3	
1386.60	55.10	263.90	1185.8	439.7	-57.6	-511.0	0.71	0.67	0.29	12	100	800	2000				50	3	
1412.10	55.50	264.40	1200.3	460.7	-59.7	-531.8	0.67	0.47	0.59	12	100	800	2000				50	3	
1440.55	55.70	264.90	1216.4	484.1	-61.9	-555.2	0.48	0.21	0.53	12	100	800	2000				50	3	
1469.00	56.20	265.10	1232.4	507.7	-63.9	-578.7	0.56	0.53	0.21	12	100	800	2000				50	3	
1526.00	57.40	265.30	1263.6	555.4	-67.9	-626.2	0.64	0.63	0.11	12	100	800	2000				45	3	
1554.57	57.80	265.50	1278.9	579.5	-69.9	-650.2	0.46	0.42	0.21	12	100	800	2000				45	3	
1583.10	57.80	265.50	1294.1	603.6	-71.8	-674.3	0.00	0.00	0.00	5	100	800	2000				10	3	
1611.60	58.60	265.70	1309.1	627.8	-73.6	-698.5	0.86	0.84	0.21	5	100	800	2000				10	3	
1640.10	59.40	265.80	1323.8	652.2	-75.4	-722.8	0.85	0.84	0.11	5	100	800	2000				10	3	
1668.60	59.80	265.80	1338.2	676.7	-77.2	-747.3	0.42	0.42	0.00	5	100	800	2000				10	3	
1697.10	60.20	265.60	1352.4	701.4	-79.1	-771.9	0.46	0.42	-0.21	5	100	800	2000				10	3	
1710.00	60.60	265.70	1358.8	712.6	-79.9	-783.1	0.95	0.93	0.23	5	100	800	2000				10	3	
1720.00	60.70	265.70	1363.7	721.3	-80.6	-791.8	0.30	0.30	0.00	10		760	1800				35		Projection to TD.

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DRILLING SERVICES

BHA Report

Customer : Western Underground Gas Storage Pty. Ltd.
Well : Iona #5 ST1
Country : Australia
Lease : PPL 2 Otway Basin
Rig : OD&E 30
Job # : VI-DD-90005

BHA# 1

BHA# 1 : Date In 26/04/19 MD In (m) : 656 TVD In (m) : 656 Date Out 28/04/199 MD Out (m): 963 TVD Out (m): 932

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
2	12.250	Smith	02M	lg3627	3x16, 1x12	0.699	1-1- - -E-1- -DTF

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs
1	8.000	SSDS	SperryDrill	800177			84	27.50

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Tricone	lg3627	12.250				P 6-5/8" Reg	0.25	
2	8" SperryDrill Lobe 6/7 - 4.0 stg	800177	8.000	5.250	12.000	97.53	B 6-5/8" Reg	9.61	0.75
3	Float Sub	A 234	8.125	3.312		147.34	B 6-5/8" Reg	0.73	
4	Integral Blade Stabiliser	5022	8.500	2.810	11.562	172.25	B 6-5/8" Reg	1.45	11.19
5	8" DWD 1200 System	HOC46808	8.000	3.750		133.66	B 6-5/8" Reg	9.14	
6	Non-Mag Drill collar	6849	8.000	2.810		150.17	B 6-5/8" Reg	8.93	
7	Cross Over Sub		6.188	2.875		80.37	B 4" IF	0.83	
8	Cross Over Sub		6.313	2.813		85.49	B 4-1/2" IF	0.37	
9	23 x HWDP		5.000	3.000		49.30	B 4-1/2" IF	209.41	
10	Drilling Jar	1416-1128	6.375	2.750		88.54	B 4-1/2" IF	9.83	
11	6x HWDP		5.000	3.000		49.30	B 4-1/2" IF	54.52	
								305.07	

Parameter		Min	Max	Ave
WOB (klbs)	:	10	20	13
RPM (rpm)	:	40	100	45
Flow (gpm)	:	750	760	757
SPP (psi)	:	1550	1800	1778

Activity	Hrs
Drilling :	22.50
Reaming :	0.00
Circ-Other :	5.00
Total :	27.50

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)

PERFORMANCE

	In	Out
Inclination (deg)	0.67	50.45
Azimuth (deg)	184.12	260.46

	Distance (m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :	203.50	17			6.00
Rotated :	103.50	7	0.00	0.00	
Total :	307.00	14	4.86	0.00	4.91

COMMENTS

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DRILLING SERVICES

BHA Report page 2

Customer : Western Underground Gas Storage Pty. Ltd.
Well : Iona #5 ST1
Country : Australia
Lease : PPL 2 Otway Basin
Rig : OD&E 30
Job # : VI-DD-90005

BHA# 1

OBJECTIVES:

The objectives of this run are to build to 55 degrees with an 8" 6/7 lobed 4 stage motor, and a Smith Magnum Tricone bit.

RESULTS:

This BHA did not attain the 5.5°/30m as initially planned. Due to the soft formation the BHA under performed in build mode until +/- 40 degrees of inclination. From there on the BHA was yielding +/- 7°/30m which was what was required to hit the target.

Due to an MWD failure the BHA was pulled and the motor was laid down and the MWD changed.

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BHA Report

Customer : Western Underground Gas Storage Pty. Ltd.
Well : Iona #5 ST1
Country : Australia
Lease : PPL 2 Otway Basin
Rig : OD&E 30
Job # : VI-DD-90005

BHA# 2

BHA# 2 : Date In 28/04/19 MD In (m) : 963 TVD In (m) : 932 Date Out 30/04/199 MD Out (m): 1287 TVD Out (m): 1127

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
2rr1	12.250	Smith	02m	ig3627	3x16, 1x20	0.896	2-2- - -E-1- -ROP

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 Smith Magnum.	ig3627	12.250	3.000	12.250	377.57	P 6-5/8" Reg	0.30	
2	Integral Blade Stabiliser Near Bit	AIB1148	8.000	3.000	12.250	147.22	B 6-5/8" Reg	1.69	1.00
3	8" DWD 1200 System	HOC46808	8.000	3.750		133.66	B 6-5/8" Reg	9.14	
4	Integral Blade Stabiliser	5022	8.500	2.810	11.562	172.25	B 6-5/8" Reg	1.45	11.73
5	Non-Mag Drill collar	6849	8.000	2.810		150.17	B 6-5/8" Reg	8.93	
6	Cross Over Sub		6.188	2.875		80.37	B 4" IF	0.83	
7	Cross Over Sub		6.313	2.813		85.49	B 4" IF	0.37	
8	23 x HWDP		5.000	3.000		49.30	B 4-1/2" IF	209.41	
9	Drilling Jar	1416-1128	6.375	2.750		88.54	B 4-1/2" IF	9.83	
10	6x HWDP		5.000	3.000		49.30	B 4-1/2" IF	54.52	
								296.47	

Parameter		Min	Max	Ave
WOB (klbs)	:	20	30	25
RPM (rpm)	:	100	100	100
Flow (gpm)	:	750	750	750
SPP (psi)	:	1550	1550	1550

Activity	Hrs
Drilling :	29.00
Reaming :	2.50
Circ-Other :	1.00
Total :	32.50

BHA Weight		(lb)
in Air (Total)	:	56284
in Mud (Total)	:	48649
in Air (Bel Jars	:	44611
in Mud (Bel Jars	:	38559

Drill String	OD(in)	Len (m)

PERFORMANCE

	In	Out
Inclination (deg)	50.45	52.89
Azimuth (deg)	260.46	263.31

	Distance (m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :	0.00	0			
Rotated :	324.00	11			
Total :	324.00	11	0.23	0.26	0.31

COMMENTS

The goals on this run are to build to the geological objective.

sperry-sun
DRILLING SERVICES

BHA Report

Customer : Western Underground Gas Storage Pty. Ltd.
Well : Iona #5 ST1
Country : Australia
Lease : PPL 2 Otway Basin
Rig : OD&E 30
Job # : VI-DD-90005

BHA# 3

BHA# 3 : Date In 30/04/19 MD In (m) : 1287 TVD In (m) : 1127 Date Out 02/05/199 MD Out (m): 1720 TVD Out (m): 1364

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
2	12.250	Security DBS	PDC	7970231	5x18	1.243	

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	PDC (Security FM 2965)	7970231	12.250	3.000	12.250	377.57	P 6-5/8" Reg	0.25	
2	Integral Blade Stabiliser Near Bit	AIB1148	8.000	3.000	12.250	147.22	B 6-5/8" Reg	1.69	0.95
3	8" DWD 1200 System	HOC46808	8.000	3.750		133.66	B 6-5/8" Reg	9.14	
4	Float Sub	A 125	8.000	2.875		149.18	B 6-5/8" Reg	0.65	
5	Integral Blade Stabiliser	5022	8.500	2.810	11.562	172.25	B 6-5/8" Reg	1.45	12.33
6	Non-Mag Drill collar	6849	8.000	2.810		150.17	B 6-5/8" Reg	8.93	
7	Cross Over Sub		6.188	2.875		80.37	B 4" IF	0.83	
8	Cross Over Sub		6.313	2.813		85.49	B 4" IF	0.37	
9	23x HWDP		5.000	3.000		49.30	B 4-1/2" IF	209.41	
10	Drilling Jar	1416-1128	6.375	2.750		88.54	B 4-1/2" IF	9.83	
11	6x HWDP		5.000	3.000		49.30	B 4" IF	54.52	
								297.07	

Parameter		Min	Max	Ave
WOB (klbs)	:	5	12	10
RPM (rpm)	:	100	100	100
Flow (gpm)	:	800	800	800
SPP (psi)	:	2000	2000	2000

Activity	Hrs
Drilling :	27.00
Reaming :	0.00
Circ-Other :	5.50
Total :	32.50

BHA Weight	(lb)
in Air (Total) :	56541
in Mud (Total) :	48698
in Air (Bel Jars :	44867
in Mud (Bel Jars :	38644

Drill String	OD(in)	Len(m)

PERFORMANCE

	In	Out
Inclination (deg)	52.89	60.70
Azimuth (deg)	263.31	265.70

	Distance(m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Oriented :	0.00	0			
Rotated :	433.00	16	0.50	0.30	
Total :	433.00	16	0.54	0.17	0.56

COMMENTS

Continue building to the geological objective.

908215 240

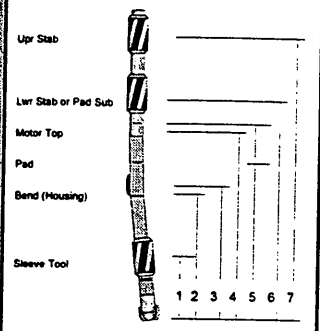
sperry-sun DRILLING SERVICES

MOTOR PERFORMANCE REPORT

M-VI-DD-90005-1

Motor Serial #	800177	**Job #**	VI-DD-90005
Directional Driller(s)	Robert Wyche, Ian Hutchinson	**Customer**	Western Underground Gas Storage Pty. Ltd.
Location	PPL 2 Otway Basin	**Rig**	OD&E 30
Well	Iona #5 ST1	**Bit Run #**	2 **BHA #** : 1 **Motor Run #** : 1
Depth In/Out	656 / 963 *m*	**Date In/Out**	26/04/1999 / 28/04/1999 **Hole Size** : 12.250 *in*
Application Details	Kickoff		

MOTOR CONFIGURATION



	From Bit *(m)*	Component		Type	Diam In/Out *(in)*
1	0.75	Sleeve Stab/Pad	Yes	Stab: 3 I 180°	12.000 12.000
2	1.75	Bent Housing	Yes	Non-Adjustable: ° bend	
3		Housing Tool Used	No		
4	9.86	Stator Elastomer			
5		Bent Sub / 2nd Bent Hsg	No		
6	11.19	Lower String Stab	Yes	Stab: 3 I 180°	11.562 11.562
7		Upper String Stab	No		

Additional Features :

Flex Collar : No **Short Brg Pack** : No **Rtr Noz / Size** : */32's*

Brg Cfg (Off/On) : **Lobe Cfg** : **BHA OD/ID** : 8.125 / 3.312 *in*

	Arr	Ret
Pick Up Sub	No	No
Bit Box Protr	No	No

MOTOR RUN DATA

Max Dogleg While Rotating	*/30m*	**RPM**	40	**Motor Stalled**	No	**Prev Job/Well Hrs**	0.00
Max Dogleg Overpulled In	*/30m*	**Force**	*lbf*	**Float Valve**	Yes	**Drilling Hrs**	22.50
Max Dogleg Pushed Through	*/30m*	**Force**	*lbf*	**DP Filter**	No	**Circ Hrs**	5.00
Hole Azimuth Start / End	184.12° / 260.46°	**Inc Start / End**	0.67° / 50.45°			**Reaming Hrs**	0.00
Interval Oriented / Rot.	203 / 104 *m*	**Directional Perf Ori / Rot**	6.00 / 0.00 */30m*			**Total Hrs This Run**	27.50
Jarring Occured : No						**New Cumulative Hrs**	27.50

	Diff Press *(psi)*	Str RPM	Rotn Torque *(ft-lbs)*	Drag Up/Dn *(lbf)*	WOB *(klbs)*	ROP Oriented *(m/hr)*	ROP Rotated *(m/hr)*
Avg :	84	45		/	13	17	7
Max :	100	100		/	20	85	35

PRE-RUN TESTS

Motor Tested Pre-Run : No **with** : , Bit, MWD

Dump Sub Operating : N/A **Brg Play** : *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 : No **Brg Play** : *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** : **Mud Wt** : 8.9 *ppg* **SPP Start/End** : 1750 / 1550 *psi*

% Oil/Water : / **% Solids** : 3.20 **% Sand** : 0.50 **PV** : 11 *cp* **YP** : 14.0 *lbf/100ft²* **pH** : 10.0

DH Temp Avg/Max : / **FlowRate Avg/Max** : 757 / 760 *gpm* **Chloride Content** : 22000 *ppm*

Principle Formation Name(s) : PEBBLE POINT, PAARATTE **Lithology** :

BIT DATA

Make : Smith **Type** : 02M **Serial #** : lg3627

Prev Drilling Hrs : 0.00 **Prev Reaming Hrs** : 0.00 **No of Runs This Bit** : 1

Jet Sizes */32's)* : 3x16, 1x12 **TFA** : 0.699 *in²* **Gage Length** : *in*

Dull Grade	1	2	3	4	5	6	7	8
In								
Out	1	1			E	1		DTF

PERFORMANCE COMMENTS

Problem Perceived : No **Problem Date** :

Performance Motor : No **Tandem Motor** : No

Service Interrupt : No **Service Interrupt Hrs** :

LIH : No **PPR Ref #** :

This Motor was pulled because of an MWD failure, and was laid down due to hours on motor (+/- 100 hrs.)

Customer Representative's Signature (optional) : ..... **Date:** .....

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty. Ltd.
Well : Iona #5 ST1
Country : Australia
Lease : PPL 2 Otway Basin
Rig : OD&E 30
Job # : VI-DD-90005

CURRENT STATUS Report # 1 22/04/1999

Total Depth	(m)	:	274	Casing Depth	(m) :		Operator Reps : Wally Westman, Jack lambert
Drilled last 24 hrs	(m)	:	274	Casing Diameter	(in) :	13.000	SSDS Reps : Robert Wyche (1)
Hole Size	(in)	:		Casing ID	(in) :		

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
150.00	0.75	48.00	150.00	74.27	N89.49W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
NARRAWATURK MARL	202.98	202.97

BHA SUMMARY

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	8.9	43	11	14.0	6.0 / 14.0	9	10.0	3.20	0.50	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:15	0.25	0.00		Trip In
00:15	06:00	5.75	31.00		Drilling
06:00	07:30	1.50	31.00		Rig Repair
07:30	12:00	4.50	123.00		Drilling
12:00	12:30	0.50	123.00		Circulate
12:30	15:30	3.00	123.00		Short Trip
15:30	17:30	2.00	164.00		Drilling
17:30	18:00	0.50	164.00		Deviation Survey
18:00	00:00	6.00	274.00		Drilling

COMMENTS

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sperry-sun DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty. Ltd.
Well :	Iona #5 ST1
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	OD&E 30
Job # :	VI-DD-90005

CURRENT STATUS Report # 2 23/04/1999

Total Depth	(m)	:	621	Casing Depth	(m)	:	
Drilled last 24 hrs	(m)	:	347	Casing Diameter	(in)	:	13.000
Hole Size	(in)	:		Casing ID	(in)	:	

Operator Reps : Wally Westman, Jack lambert

SSDS Reps : Robert Wyche (2), Ian Hutchinson (1)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
320.00	0.75	40.00	319.98	72.76	N88.23W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
PEBBLE POINT	613.98	613.95

BHA SUMMARY

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	9.2	59	20	32.0	8.0 / 22.0	15	8.7	5.10	0.40	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	04:30	4.50	337.00		Drilling
04:30	05:00	0.50	337.00		Deviation Survey
05:00	10:30	5.50	432.00		Drilling
10:30	11:00	0.50	432.00		Service Rig
11:00	00:00	13.00	621.00		Drilling

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty. Ltd.
Well :	Iona #5 ST1
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	OD&E 30
Job # :	VI-DD-90005

CURRENT STATUS Report # 3 24/04/1999

Total Depth	(m)	:	656	Casing Depth	(m)	:	
Drilled last 24 hrs	(m)	:	35	Casing Diameter	(in)	:	13.000
Hole Size	(in)	:		Casing ID	(in)	:	

Operator Reps : Wally Westman, Jack lambert
SSDS Reps : Robert Wyche (3), Ian Hutchinson (2)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
645.00	0.75	151.00	644.97	70.36	N88.35W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
PEBBLE POINT	613.98	613.95

BHA SUMMARY

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	9.0	48	12	22.0	8.0 / 16.0	8	8.1	3.70	0.50	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	06:30	6.50	656.00		Drilling
06:30	07:00	0.50	656.00		Circulate
07:00	07:30	0.50	656.00		Deviation Survey
07:30	12:00	4.50	656.00		Short Trip
12:00	13:00	1.00	656.00		Circulate
13:00	15:30	2.50	656.00		Trip Out
15:30	00:00	8.50	656.00		Run Casing / Cement

COMMENTS

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sperry-sun DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty. Ltd.
Well :	Iona #5 ST1
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	OD&E 30
Job # :	VI-DD-90005

CURRENT STATUS Report # 4 25/04/1999

Total Depth	(m)	:	656	Casing Depth	(m)	:	
Drilled last 24 hrs	(m)	:	0	Casing Diameter	(in)	:	13.000
Hole Size	(in)	:		Casing ID	(in)	:	

Operator Reps : Wally Westman, Jack lambert

SSDS Reps : Robert Wyche (4), Ian Hutchinson (3)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
645.00	0.75	151.00	644.97	70.36	N88.35W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
PEBBLE POINT	613.98	613.95

BHA SUMMARY

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	9.0	48	12	22.0	8.0 / 16.0	8	8.1	3.70	0.50	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:00	24.00	656.00		Run Casing / Cement / Nipple up BOP's

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty. Ltd.
Well :	Iona #5 ST1
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	OD&E 30
Job # :	VI-DD-90005

CURRENT STATUS Report # 5 26/04/1999

Total Depth	(m)	:	656	Casing Depth	(m)	:	Operator Reps	: Wally Westman, Jack lambert
Drilled last 24 hrs	(m)	:	0	Casing Diameter	(in)	: 13.000	SSDS Reps	: Robert Wyche (5), Ian Hutchinson (4)
Hole Size	(in)	:	12.250	Casing ID	(in)	:		

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
645.00	0.75	151.00	644.97	70.36	N88.35W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
PEBBLE POINT	613.98	613.95

BHA SUMMARY

BHA 1: 305.07 m; Bit #2 (0.5 hrs), PDM #1 (1. hrs), Sub, Stab, MWD, DC, Sub, Sub, HWDP, Jar, 6x HWDP

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	9.0	48	12	22.0	8.0 / 16.0	8	8.1	3.70	0.50	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	10:30	10.50	656.00		Nipple Up BOP
10:30	17:00	6.50	656.00		Test BOP
17:00	17:30	0.50	656.00		Miscellaneous
17:30	19:30	2.00	656.00		Lay out 8" DC
19:30	21:30	2.00	656.00	1	PU/LD BHA
21:30	23:00	1.50	656.00	1	Trip In
23:00	23:30	0.50	656.00	1	Drill Cement @ 625m
23:30	00:00	0.50	656.00	1	Circulate

COMMENTS

908215 246

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty. Ltd.
Well : Iona #5 ST1
Country : Australia
Lease : PPL 2 Otway Basin
Rig : OD&E 30
Job # : VI-DD-90005

CURRENT STATUS Report # 6 27/04/1999

Total Depth	(m)	:	928	Casing Depth	(m) :		
Drilled last 24 hrs	(m)	:	272	Casing Diameter	(in) :	13.000	
Hole Size	(in)	:	12.250	Casing ID	(in) :		

Operator Reps : Wally Westman, Jack lambert
SSDS Reps : Robert Wyche (6), Ian Hutchinson (5)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
924.20	43.00	262.00	905.27	147.62	S87.81W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
PAARATTE	657.00	656.97

BHA SUMMARY

BHA 1: 305.07 m; Bit #2 (22.5 hrs), PDM #1 (24. hrs), Sub, Stab, MWD, DC, Sub, Sub, HWDP, Jar, 6x HWDP

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	8.9	43	11	14.0	6.0 / 14.0	9	10.0	3.20	0.50	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	02:00	2.00	656.00	1	Drill Cement
02:00	03:00	1.00	656.00	1	Circulate
03:00	04:00	1.00	656.00	1	FIT
04:00	00:00	20.00	928.00	1	Drilling

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty. Ltd.
Well : Iona #5 ST1
Country : Australia
Lease : PPL 2 Otway Basin
Rig : OD&E 30
Job # : VI-DD-90005

CURRENT STATUS Report # 7 28/04/1999

Total Depth	(m)	:	1116	Casing Depth	(m)	:	
Drilled last 24 hrs	(m)	:	188	Casing Diameter	(in)	:	13.000
Hole Size	(in)	:	12.250	Casing ID	(in)	:	

Operator Reps : Wally Westman, Jack lambert
SSDS Reps : Robert Wyche (7), Ian Hutchinson (6)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1097.67	53.30	261.10	1014.38	281.73	S84.40W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
SKULL CREEK MEMBER	1097.00	1013.98

BHA SUMMARY

BHA 1: 305.07 m; Bit #2 (25. hrs), PDM #1 (27.5 hrs), Sub, Stab, MWD, DC, Sub, Sub, HWDP, Jar, 6x HWDP
BHA 2: 296.47 m; Bit #2rr1 (12. hrs), Stab, MWD, Stab, DC, Sub, Sub, HWDP, Jar, 6x HWDP

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	8.9	47	14	20.0	6.0 / 12.0	7	9.5	3.20	0.50	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	02:30	2.50	963.00	1	Drilling
02:30	03:30	1.00	963.00	1	Circulate
03:30	04:00	0.50	963.00	1	Trip Out
04:00	04:30	0.50	963.00	1	Cut Drill Line
04:30	08:30	4.00	963.00	1	POOH, lay out motor, replace MWD, P/U BHA #2
08:30	12:00	3.50	963.00	2	Trip In
12:00	14:30	2.50	963.00	2	Reaming / Washing 847m to 963m
14:30	00:00	9.50	1116.00	2	Drilling

COMMENTS

908215 248

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer : Western Underground Gas Storage Pty. Ltd.
Well : Iona #5 ST1
Country : Australia
Lease : PPL 2 Otway Basin
Rig : OD&E 30
Job # : VI-DD-90005

CURRENT STATUS Report # 8 29/04/1999

Total Depth	(m)	:	1287	Casing Depth	(m)	:	
Drilled last 24 hrs	(m)	:	171	Casing Diameter	(in)	:	13.000
Hole Size	(in)	:	12.250	Casing ID	(in)	:	

Operator Reps : Wally Westman, Jack lambert
SSDS Reps : Robert Wyche (8), Ian Hutchinson (7)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1278.30	52.80	262.80	1122.02	426.70	S83.58W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
SKULL CREEK MEMBER	1097.00	1013.98

BHA SUMMARY

BHA 2: 296.47 m; Bit #2rr1 (31.5 hrs), Stab, MWD, Stab, DC, Sub, Sub, HWDP, Jar, 6x HWDP

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	9.0	56	20	32.0	6.0 / 17.0	6	9.5	3.70	1.40	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	10:00	10.00	1211.00	2	Drilling
10:00	10:30	0.50	1211.00	2	Service Rig
10:30	20:00	9.50	1287.00	2	Drilling
20:00	21:00	1.00	1287.00	2	Circulate
21:00	00:00	3.00	1287.00	2	Trip Out

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty. Ltd.
Well :	Iona #5 ST1
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	OD&E 30
Job # :	VI-DD-90005

CURRENT STATUS Report # 9 30/04/1999

Total Depth	(m)	:	1577	Casing Depth	(m)	:	Operator Reps	: Wally Westman, Jack lambert
Drilled last 24 hrs	(m)	:	290	Casing Diameter	(in)	: 13.000	SSDS Reps	: Robert Wyche (9), Ian Hutchinson (8)
Hole Size	(in)	:	12.250	Casing ID	(in)	:		

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1554.57	57.80	265.50	1278.87	653.98	S83.87W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
BELFAST	1511.00	1255.45

BHA SUMMARY

BHA 2: 296.47 m; Bit #2rr1 (31.5 hrs), Stab, MWD, Stab, DC, Sub, Sub, HWDP, Jar, 6x HWDP

BHA 3: 297.07 m; Bit #2 (17. hrs), Stab, MWD, Sub, Stab, DC, Sub, Sub, 23x HWDP, Jar, 6x HWDP

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	9.1	68	23	39.0	8.0 /.20.0	5	8.6	4.30	0.60	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:30	0.50	1287.00	2	Trip Out (at Surface)
00:30	01:30	1.00	1287.00	2	Change bit install exrta float below top stab
01:30	05:00	3.50	1287.00	3	Trip In
05:00	12:30	7.50	1468.00	3	Drilling
12:30	13:00	0.50	1468.00	3	Circulate
13:00	14:00	1.00	1487.00	3	Drilling
14:00	14:30	0.50	1487.00	3	Circulate
14:30	21:30	7.00	1570.00	3	Drilling
21:30	22:30	1.00	1570.00	3	Rig Repair
22:30	00:00	1.50	1577.00	3	Drilling

COMMENTS

908215 250

sperry-sun DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty. Ltd.
Well :	Iona #5 ST1
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	OD&E 30
Job # :	VI-DD-90005

CURRENT STATUS Report # 10 01/05/1999

Total Depth	(m)	:	1720	Casing Depth	(m)	:	
Drilled last 24 hrs	(m)	:	143	Casing Diameter	(in)	:	13.000
Hole Size	(in)	:	12.250	Casing ID	(in)	:	

Operator Reps : Wally Westman, Jack lambert
SSDS Reps : Robert Wyche (10), Ian Hutchinson (9)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1720.00	60.70	265.70	1363.72	795.91	S84.19W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
WAARRE C2 SAND	1651.00	1329.31

BHA SUMMARY

BHA 3: 297.07 m; Bit #2 (27. hrs), Stab, MWD, Sub, Stab, DC, Sub, Sub, 23x HWDP, Jar, 6x HWDP

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	9.2	59	20	32.0	8.0 / 22.0	15	8.7	5.10	0.40	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	08:00	8.00	1687.00	3	Drilling
08:00	08:30	0.50	1687.00	3	Service Rig
08:30	10:30	2.00	1720.00	3	Drilling
10:30	12:00	1.50	1720.00	3	Circulate
12:00	19:30	7.50	1720.00	3	Short Trip to shoe, tight spots 1435m, 1350m, 1040m, 1018m
19:30	22:30	3.00	1720.00	3	Circulate, pump GYRO to bottom
22:30	00:00	1.50	1720.00	3	Trip Out

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty. Ltd.
Well :	Iona #5 ST1
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	OD&E 30
Job # :	VI-DD-90005

CURRENT STATUS Report # 11 02/05/1999

Total Depth	(m)	:	1720	Casing Depth	(m)	:	
Drilled last 24 hrs	(m)	:	0	Casing Diameter	(in)	:	13.000
Hole Size	(in)	:	12.250	Casing ID	(in)	:	

Operator Reps : Wally Westman, Jack lambert
SSDS Reps : Robert Wyche (11), Ian Hutchinson (10)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1720.00	60.70	265.70	1363.72	795.91	S84.19W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
WAARRE C2 SAND	1651.00	1329.31

BHA SUMMARY

BHA 3: 297.07 m; Bit #2 (27. hrs), Stab, MWD, Sub, Stab, DC, Sub, Sub, 23x HWDP, Jar, 6x HWDP

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	9.2	59	20	32.0	8.0 / 22.0	15	8.7	5.10	0.40	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	03:30	3.50	1720.00	3	Trip Out (at Surface)
03:30	08:00	4.50	1720.00	3	Wireline Logs
08:00	10:00	2.00	1720.00		Trip In
10:00	10:30	0.50	1720.00		Cut Drill Line
10:30	13:00	2.50	1720.00		Trip In
13:00	14:30	1.50	1720.00		Circulate
14:30	18:30	4.00	1720.00		Trip Out
18:30	00:00	5.50	1720.00		Wireline Logs

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty. Ltd.
Well :	Iona #5 ST1
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	OD&E 30
Job # :	VI-DD-90005

CURRENT STATUS Report # 12 03/05/1999

Total Depth	(m)	:	1720	Casing Depth	(m)	:	
Drilled last 24 hrs	(m)	:	0	Casing Diameter	(in)	:	13.000
Hole Size	(in)	:		Casing ID	(in)	:	

Operator Reps : Wally Westman, Jack lambert
SSDS Reps : Robert Wyche (12), Ian Hutchinson (11)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1720.00	60.70	265.70	1363.72	795.91	S84.19W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
WAARRE C2 SAND	1651.00	1329.31

BHA SUMMARY

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	9.2	59	20	32.0	8.0 / 22.0	15	8.7	5.10	0.40	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	00:00	24.00	1720.00		Wireline Logs

COMMENTS

sperry-sun
DRILLING SERVICES

Daily Drilling Report

Customer :	Western Underground Gas Storage Pty. Ltd.
Well :	Iona #5 ST1
Country :	Australia
Lease :	PPL 2 Otway Basin
Rig :	OD&E 30
Job # :	VI-DD-90005

CURRENT STATUS Report # 13 04/05/1999

Total Depth	(m)	:	1720	Casing Depth	(m)	:	
Drilled last 24 hrs	(m)	:	0	Casing Diameter	(in)	:	13.000
Hole Size	(in)	:		Casing ID	(in)	:	

Operator Reps : Wally Westman, Jack lambert
SSDS Reps : Robert Wyche (13), Ian Hutchinson (12)

LAST SURVEY

Depth (m)	Inclination	Azimuth	TVD (m)	Displ (m)	Direction
1720.00	60.70	265.70	1363.72	795.91	S84.19W

LAST FORMATION TOP

Formation Name	MD Top (m)	TVD Top (m)
WAARRE C2 SAND	1651.00	1329.31

BHA SUMMARY

MUD DATA

Type	Weight (ppg)	FV (sec)	PV (cp)	YP (lbf/100ft²)	Gels	Fluid Loss	pH	Solids (%)	Sand (%)	Oil (%)
Waterbase	9.2	59	20	32.0	8.0 / 22.0	15	8.7	5.10	0.40	

TIME BREAKDOWN

From	To	Hours	TMD (m)	BHA #	Activity
00:00	09:00	9.00	1720.00		POOH with logging tools

COMMENTS

APPENDIX 7

Drilling fluid recap by Baroid

WESTERN UNDERGROUND GAS STORAGE
DRILLING FLUID RECAP
IONA – 5 ST1
PPL - 2 OTWAY BASIN, VICTORIA

Prepared by : Tun Aung

Date : May, 1999

Table Of Contents

WELL SUMMARY

1.1 Well Data

Well Name	:	Iona - 5 ST1
Operator	:	Western Underground Gas Storage Pty Ltd.
Well Type	:	Directional
Maximum Deviation & Direction	:	60.7° / 265.7° relative to north
Horizontal Displacement at TD	:	721.3 m
Bottom Hole Temperature	:	58 °C (136 °F)
Location	:	PPL 2 Otway Basin, Victoria
Contractor/Rig	:	OD & E Rig 30
Start Date	:	26 April, 1999
Spud Date	:	26 April, 1999 @ 23:00 hrs
RKB to Ground level	:	5.0 m
Total Depth	:	1720 m MD, 1363.6 m TVD
Date TD Reached (Set 9 5/8" casing)	:	1 May, 1999 @ 10:30 hrs (06/05/99)
Total Days Drilling	:	4 1/2
Date Released	:	9 May, 1999 @ 24:00 hrs
Total Days on Well	:	14

1.2 Formation Tops

Formation	Lithology	MD (m) KB	TVD (m) KB	Inclination (deg)
Heytesbury Group	Limestone	Surface	Surface	0
Narrawaturk Marl	Limestone / Clay	203	203	0.75
Mepunga Formation	Silt / Clay	281	281	0.75
Dilwyn Formation	Sandstone	337	336.9	0.75
Pember Mudstone	Clay	544	543.9	0.75
Pebble Point Formation	Clay	614	613.9	0.75
Paaratte Formation	Sandstone	665	664.9	1.2
Skull Creek Member	Clay	1116	1027	53.5
Nullawarre Greensand	Sandstone	1307	1133	53.6
Belfast Mudstone	Clay /Silt	1478	1235	56.6
Waarre Formation	Sandstone	1584	1295	57.8
Total Depth	Sandstone	1720	1363	60.7

1.3 Casing Program

20"	Conductor	Iona - 5	@	5 m
13 3/8"	Intermediate Casing	Iona - 5	@	656 m
9 5/8"	Production Casing	Iona - 5 ST1	@	1720 m
7"	Completion String	Iona - 5 ST1	@	1536 m

1.4 Personnel

Drilling Supervisors	:	Wally Westman	Jack Lambert
Baroid Field Service Reps.	:	Gerald Lange	Tun Aung

2. COST SUMMARY

2.1 Drilling Fluid Costs

	Drilling Fluid	Hole Size	MD From	MD To	Cost (AUD$)
1.	KCl / EZ MUD / Polymer	121/4"	656 m	1720 m	55,189.16
Mud Materials Used For Drilling				**Total AUD$**	**55,189.16**
Mud Materials Used For Non Drilling (Cementing)				**AUD$**	**0.00**
Mud Materials Used For Completion 8.6 - 8.7 ppg KCl Brine				**AUD$**	**8,972.52**
Total Materials				**AUD$**	**64,161.68**

2.2 Engineering Costs

Service Representatives	From (date)	To (date)	Days
Gerald Lange	26/04/99	27/04/99	2
Tun Aung	28/04/99	30/04/99	3
Tun Aung	01/05/99	09/05/99	9
Total Days			**14**
Service Cost @	**$650.00 per day**	**Total A$**	**9,100.00**

Vehicle @ $ 100.00 / day		**14 days**	**$ 1400 .00**
Mileage @ $ 1.00 / km	**94,433 km to 94,768 km**	**335 km**	**$ 335.00**

Total Costs	**A $**	**74,996.68**

3. PERFORMANCE SUMMARY

3.1 Comments

- A KCl / EZ MUD / Polymer fluid was used for the well, to inhibit the reactive clays.
- Surface 17 1/2" hole (Iona - 5) was drilled trouble free and 13 3/8" casing was set at 656 m.
- A 12 1/4" deviated production hole (Iona - 5 ST1) was drilled from 656 m to 1720 m (60.7 degrees), and 9 5/8" casing was set.
- Due to the well angle and nature of configuration, Schlumberger wireline logs were held up at depths of 1480 m to 1511 m. TLC logging run had to be carried out.
- After setting the 9 5/8" production casing at 1720 m, additional logs were run on wireline, and were held up at 950 - 1050 m.
- After making a scraper run on drill pipe, the casing was displaced to 8.65 ppg Inhibited KCl brine and wireline logs were carried out.
- A 7" completion string was run. The well was test flowed, after which it was killed with inhibited KCl brine.

3.2 Performance Indicators

	Program	Actual	Achieved (± 10 %)
Interval 1. 12 1/4" Hole 656 m - 1720 m (1064 m drilled)			
• Salvaged Mud from 17 1/2" section	500+	817	Yes
• Volume Consumed	2038	2571	No
• Volume Used, bbl	2538	3388	No
• Dilution Rate, bbl/m	1.25	1.23	Yes
• Consumption Rate, bbl/m	1.95	2.42	No
• Mud Cost/bbl., A$	32.01	21.47	Yes
• Mud Cost/m., A$	62.49	51.87	Yes
• Interval Mud Cost, A$	65,236.54	55,189.16	Yes
• Drill interval with minimal mud related hole problems		Yes	Yes
• Minimal reaming/backreaming(<15 hrs Total)		Total 6.0	Yes
• Successfully run wireline logs		No	No
• Successfully set 9 5/8" production casing		Set	Yes
• Rotating Hours			
• Average ROP, m/hr		78	
		13.64	
Entire Well			
• Total Drilling fluid cost A$	65,236.54	55,189.16	Yes
Completion Interval			
• Completion Fluid Cost, A$	4,524.91	8,972.52	No

Explanation of Non-Conformance

12 1/4"Interval

- Mud volume used and consumption rate was higher than programmed, mainly due to higher losses both surface (shakers, flow nipple) and downhole.
- Due to the well angle and configuration, TLC logging had to be carried out.

Completion Interval

- Completion cost was higher since the program was based on a lower volume, assuming returns back to the pits. Since the flow line was not installed, pipe displacement fluid ended up in the cellar.
- The program was based on a lower KCl content of 14 ppb. To achieve a weight of 8.6 ppg, a higher concentration of 21 ppb was required.
- Drill water used was turbid with suspended solids. Mixed up 8.7 ppg Inhibited KCl Brine, to make allowance for contamination and settling out of suspended solids. Once the agitators were turned off, the weight dropped to 8.6 ppg.
- During testing of the well, fluid was lost casing due to unloading.
- Due to the absence of a permanent well head, the well had to be killed after testing, requiring additional 300 bbl of Inhibited KCl brine, which added to the cost.

4.

INTERVAL - 1

4.1 SUMMARY

$12^1/_4$" Hole From 656 m To 1720 m In $4^1/_2$ Drilling Days

Drilling Fluid KCl / EZMUD / Polymer

Formations Pebble Point Fm, Paaratte Fm, Skull Creek Member, Nullawarre Greensand, Belfast Mudstone, Waare Formation.

Operations Summary

The first BHA run from 656 to 963 m, utilized a slick assembly with a downhole motor to steer and build up well angle to 50 degrees.
Upon running back in with a stiff BHA and rotary assembly, had to wash / ream tight hole for $2^1/_2$ hours from 847 m (25 degrees) to 963 m (50 degrees).
Rotary drilled from 963 m to 1287 m in the Skull Creek formation clays at which stage the well angle was 53 degrees. A bit trip was made at this stage.
During the trip the BHA was changed to one of intermediate stiffness. Rotary drilled, and at 1523 m in the middle of the Belfast Formation (Clay/Silt) started trickling in 5 ppb each of BARACARB #25 and #100 to the system.
Total Depth was at 1720 m in the Waarre Sandstone.
During the wiper trip to shoe, cleaned out cutting beds by circulating and pumping LCM sweeps.
Due to the well angle and configuration TLC logging was required.
After cementing 9-5/8" casing, attempted to run wireline logs with no success. A scraper run was made, and the casing was displaced to Inhibited KCl Brine.
After additional logging, a 7" completion string was run.

Properties	Programmed		Actual (Typical)		
	Min	Max	Min	Max	Conformance
Mud Weight, ppg	-	< 9.4	8.9	9.3	Yes
PV (cP) @ 120°F		< 30	11	23	Yes
6 rpm, lb/100 ft^2	10	15	7	11	No
API Filtrate		8	5.0	9.2	No
KCL Content	3	4	3.1	4.1	No
pH	8.5	9.2	8.1	10.0	No
LGS, % v/v		<10	3.2	5.4	Yes
HPHT Filtrate, 250 F		<15	14.6	19.0	No

Explanation of Non-Conformance

- The 6 rpm rheometer reading was lower at times, mainly to conserve the stock of XCD Polymer on site and also to help minimise mud costs. Some pre-hydrated AQUAGEL in the order of 2 ppb on the system was added to help supplement the 6 rpm rheometer reading, and improve the quality of the filter cake.
- At the initial stage after drilling out cement, the API Filtrate was higher than 8.0 ml. From 750 m onwards, the filtrate was reduced.
- On two occasions the KCl Content reached 4.1 %. Premix concentration was modified as required to maintain within the 3 - 4 % range.
- Due to pre-treating the mud with Citric Acid/Soda Bicarbonate before drilling out cement, pH initially dropped to 8.1. After drilling cement it increased to 10.0 as a result of contamination.

- The HPHT Filtrate was initially on the higher side. As drilling progressed, and the solids content increased, and the mud became more concentrated with successive additions of new pre-mixes, the HPHT value slowly decreased to the15 ml range.

Maintenance

- Mud volume and properties were maintained by the addition of new premixed mud.
- The premix formulation was slightly changed as required to maintain fluid properties.
- A combination of EZ-MUD DP (0.5 ppb) and KCl (3.5 %) had a synergistic effect in inhibiting the reactive clays of the Belfast Mudstone.
- Before penetrating the Waarre Pay Zone, 5 ppb each of BARACARB #25 and #100 were added to the system, to help seal the formation and reduce the chances of differential sticking, and also to minimise seepage loss. The concentration was maintained until TD.
- Prior to logging and running casing, the fluid was treated with BARACIDE to prevent bacterial degradation.
- For hole cleaning, Kwik-Seal LCM Sweeps (10 ppb) with or without Polymer (1 ppb) were pumped as required.

Solids Control Equipment

- The two DFE linear motion shale shakers were fitted with # 110 mesh screens. Since a high flow rate of 19 bbl/min (798 gpm) was used, finer screens on location could not be utilized. Even with the # 110 mesh screens, both shakers had to be jacked up a fair bit, to minimise losses.
- The 4" x 12 cone Desilter operated efficiently. Underflow discharge rate was less than 1.5 bbl/hr, with discharge weights ranging from 10.5 - 14.0 ppg.
- Ran the DFE centrifuge with a slightly wet discharge to increase colloidal solids removal.
- Both the Desilter and Centrifuge were run continuously, even while tripping.
- The Sand Trap was cranked regularly as required.

4.2 EVALUATION

Comments

The combination of EZ-MUD and KCl provided sufficient inhibition, and MBT was maintained at 10 ppb or less (with a lower MBT, the 6 rpm would tend to be lower and would require more XCD Polymer to maintain).

Problems, Causes, Remedial Action Taken or Recommended

Hole Conditions

1) Problem During the first trip to change BHA at 963 m, encountered tight hole at 847 m upon running back in.
   Cause Use of a stiff assembly.
   Action Wash and ream from 847 m to bottom (2.5 hours).
2) Problem Overpull of 20 - 25 K during connection at 1468 m.
   Cause Cuttings build up due to high ROP of up to 60 m/hr using a PDC bit.
   Action Work string and circulate out.
3) Problem During wiper trip at Total Depth, encountered tight sections at 1435 m, 1350 m, and 1018 m.
   Cause Build up of cutting beds, aggravated by the well angle.
   Action Circulate, work pipe and pumped LCM sweeps as required.
4) Problem Wireline logging tools hanging up at 1484 m to 1511 m.
   Cause Well angle and geometry.
   Action Made a clean out trip to no avail. TLC logging had to be carried out.

Drilling Fluid

1) Problem No problems encountered.
   Cause
   Action

Solids Control and Mud Mixing Equipment

1) Problem Sand content higher than in other areas.
   Cause The two shakers could not handle the higher flow rates used. As a result, all screens finer than # 110 mesh could not be used, though available.
   Action Screens were jacked up to minimise shaker losses, which at times caused backflowing.

4.3 RECOMMENDATIONS FOR IMPROVEMENT

Hole Conditions

- Tight hole situations encountered were not mud related. Use of a stiffer BHA assembly in deviated hole will tend to produce tight hole on the first run in.
- If high ROP is encountered especially in the clay sections (PDC bit run), care should be taken to circulate the hole sufficiently before making a connection to minimise cutting beds.

Drilling Fluid

- The KCl / EZ MUD / Polymer fluid with the programmed properties performed well.
- Addition of some pre-hydrated AQUAGEL (2 ppb) helped to improve the quality of the filter cake and supplemented the 6 rpm values, especially in the sands.
- Since all the Iona Wells are shallower with a low BHT (140° F), HPHT filtrate values may be relaxed.

Solids Control and Mud Mixing Equipment.

- Solids control and mixing equipment were adequate.

5. INTERVAL - 2 (COMPLETION)

5.1 SUMMARY

Production Tubing 7" Surface To 1536 m In 3 Days

Completion Fluid Inhibited KCl Brine (8.65 ppg)

Operations Summary

Ran in 7" completion string, and the displaced brine was lost. Correlated packer setting / TCP depth with wireline logs. Spaced out and set plug. Pressured up to 2700 psi and set packer at 1545.8 m. Landed hangar. Rigged up and pressure tested temporary test tree. Retrieved X/N plug.

Pressure tested annulus, choke and flare line. Opened SSD and pumped Nitrogen into 7" string and displaced 41.5 bbl brine into annulus. Closed SSD. Perforated and flowed well, unloading brine from 7"string. Set X/N plug, shut well in and bled off pressure.

Killed well with about 300 bbl of Inhibited KCl Brine.

Properties	Programmed		Actual (Typical)		
	Min	Max	Min	Max	Conformance
Brine Weight, ppg	8.6		8.6	8.7	Yes

Maintenance

- Mixed up a total of 825 bbl of 8.65 ppg inhibited brine with 0.45 % volume of Coat-2748 corrosion inhibitor.
- Even though 8.7 ppg brine was mixed, once the agitators were turned off and the suspended solids in the drill water settled out, the weight tended to drop to near 8.6 ppg.

APPENDIX

DEVIATION DATA

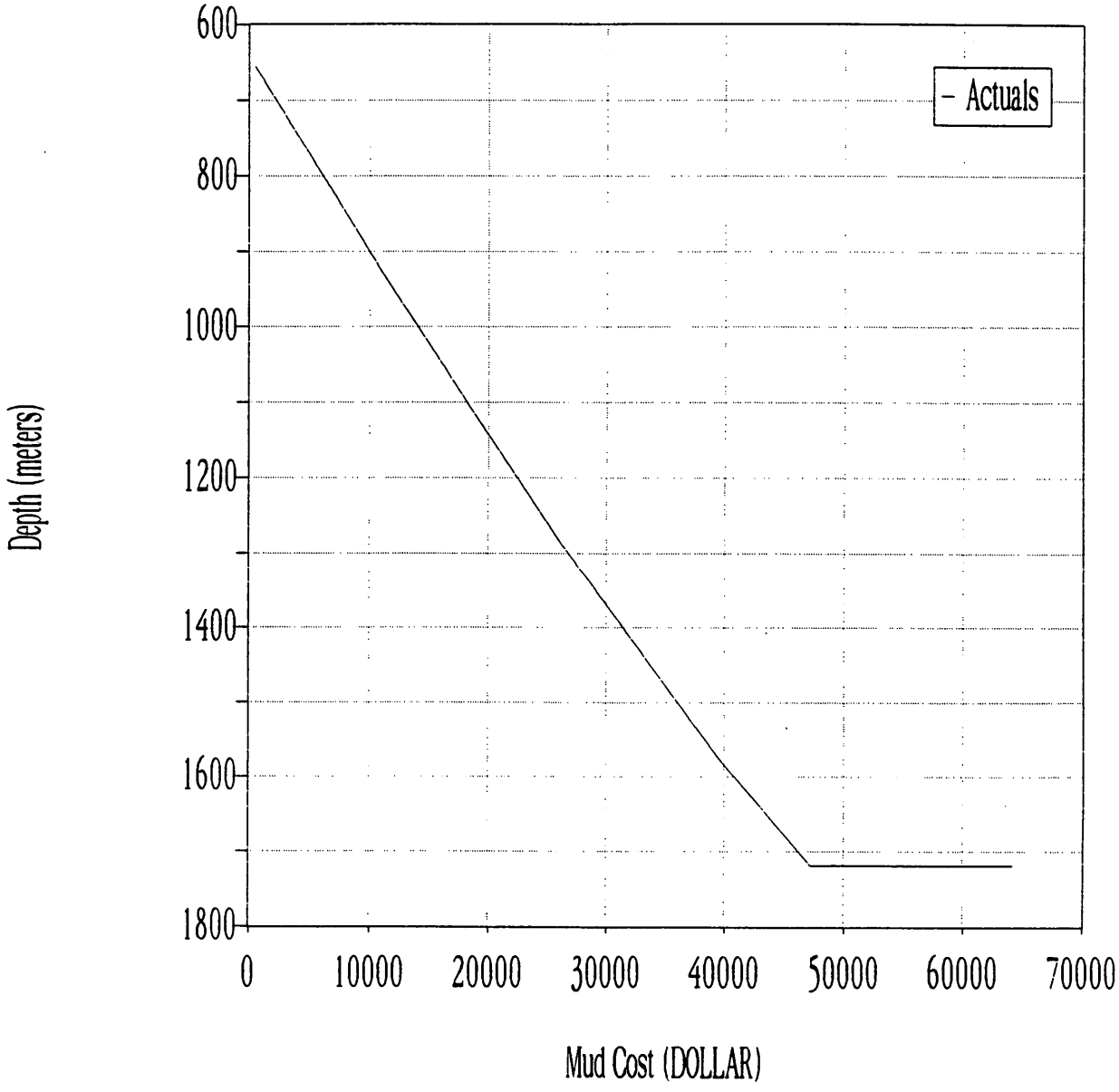
Depth MD (m)	Depth TVD (m)	Inclination (deg)	Direction (deg)	Displacement (m) (Vertical Section)
150.0	150.0	0.7	48.0	-0.8
320.0	319.9	0.7	40.0	-2.5
645.0	644.9	0.7	151.0	-4.8
696.0	696.0	1.7	245.6	-4.2
724.5	724.4	4.8	264.3	-2.7
753.1	752.8	8.8	271.4	0.6
781.6	780.7	14.3	270.3	6.3
810.1	807.9	20.5	270.0	14.7
838.6	834.3	24.0	266.5	25.5
867.2	859.6	30.7	261.3	38.6
886.2	875.6	35.2	261.3	48.9
905.2	890.8	38.1	261.9	60.3
924.2	905.2	43.0	262.0	72.6
955.1	926.5	50.2	260.4	95.1
983.6	944.5	51.1	260.6	117.1
1,012.1	962.3	51.7	260.6	139.4
1,069.1	997.2	52.8	260.5	184.4
1,097.7	1,014.4	53.3	261.1	207.2
1,211.7	1,082.0	53.5	262.3	299.0
1,288.5	1,128.2	52.9	263.4	360.4
1,383.6	1,184.1	55.1	253.9	437.3
1,497.5	1,248.0	56.9	264.9	531.5
1,583.1	1,294.0	57.8	265.5	603.6
1,668.6	1,338.1	59.8	265.8	676.8
1,697.1	1,352.4	60.2	265.6	701.4
1,710.0	1,358.7	60.6	265.7	712.6
1,720.0	1,363.6	60.7	265.7	721.3

GRAPHS

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.		AUSTRALIA
Well Name:	IONA-S ST1	Geo. Area:	OTWAY BASIN
Contractor:	O. D. & E.	Field:	PPL 2
Rig:	Rig 30	Region:	Victoria

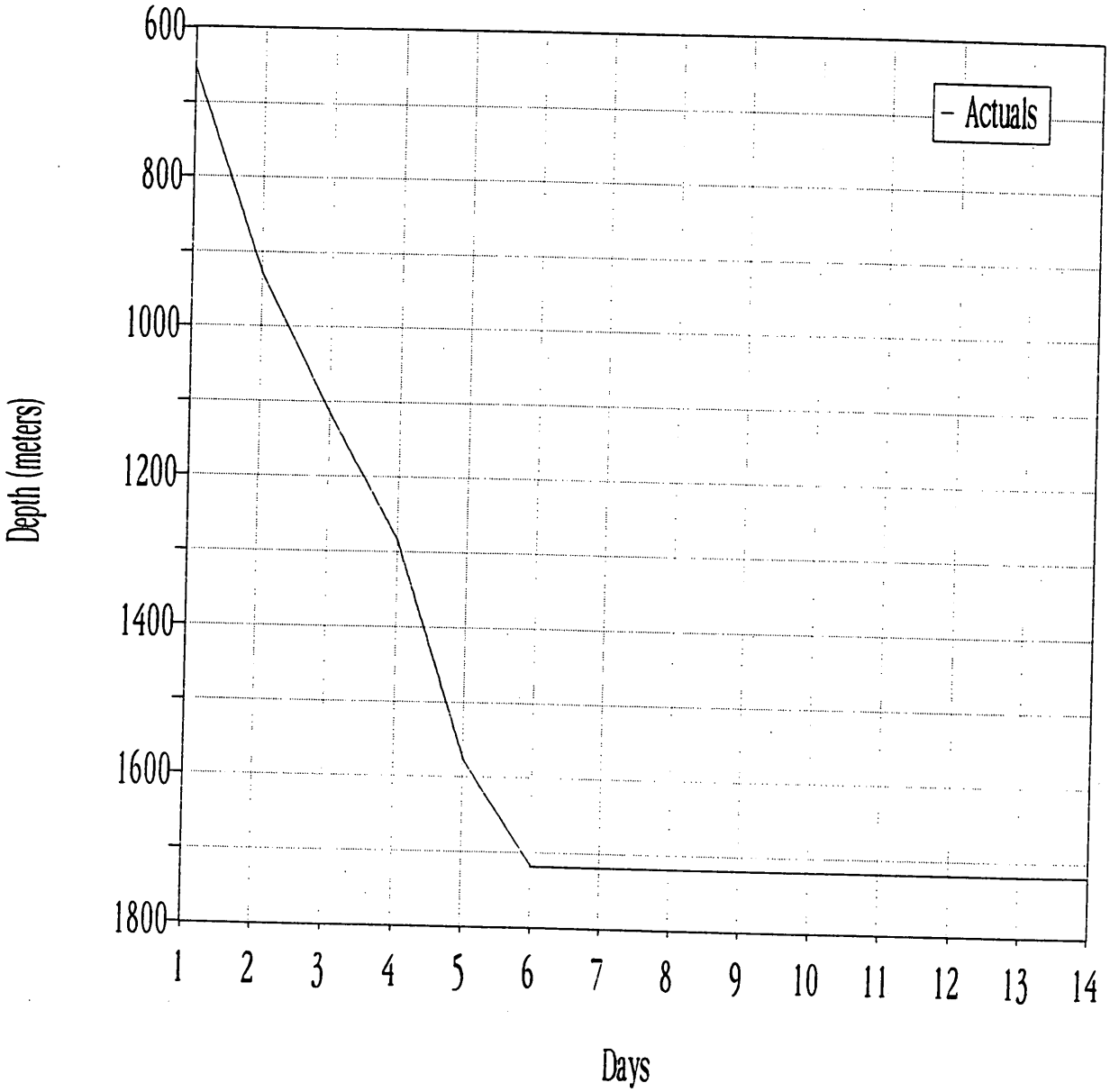
Depth vs. Mud Cost

DOLLAR



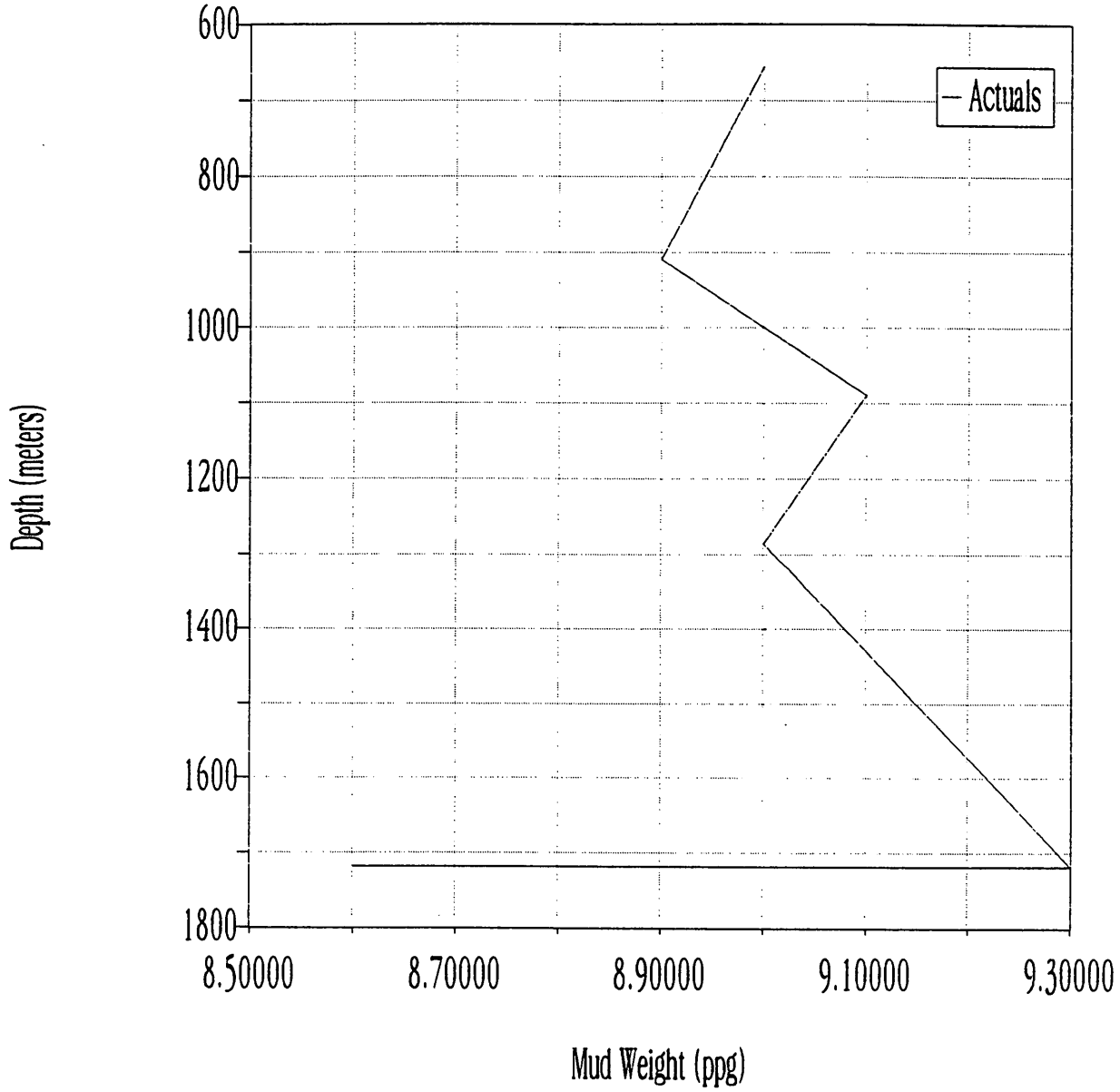
Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.		AUSTRALIA
Well Name:	IONA-S STI	Geo. Area:	OTWAY BASIN
Contractor:	O. D. & E.	Field:	PPL 2
Rig:	Rig 30	Region:	Victoria

Depth vs. Days



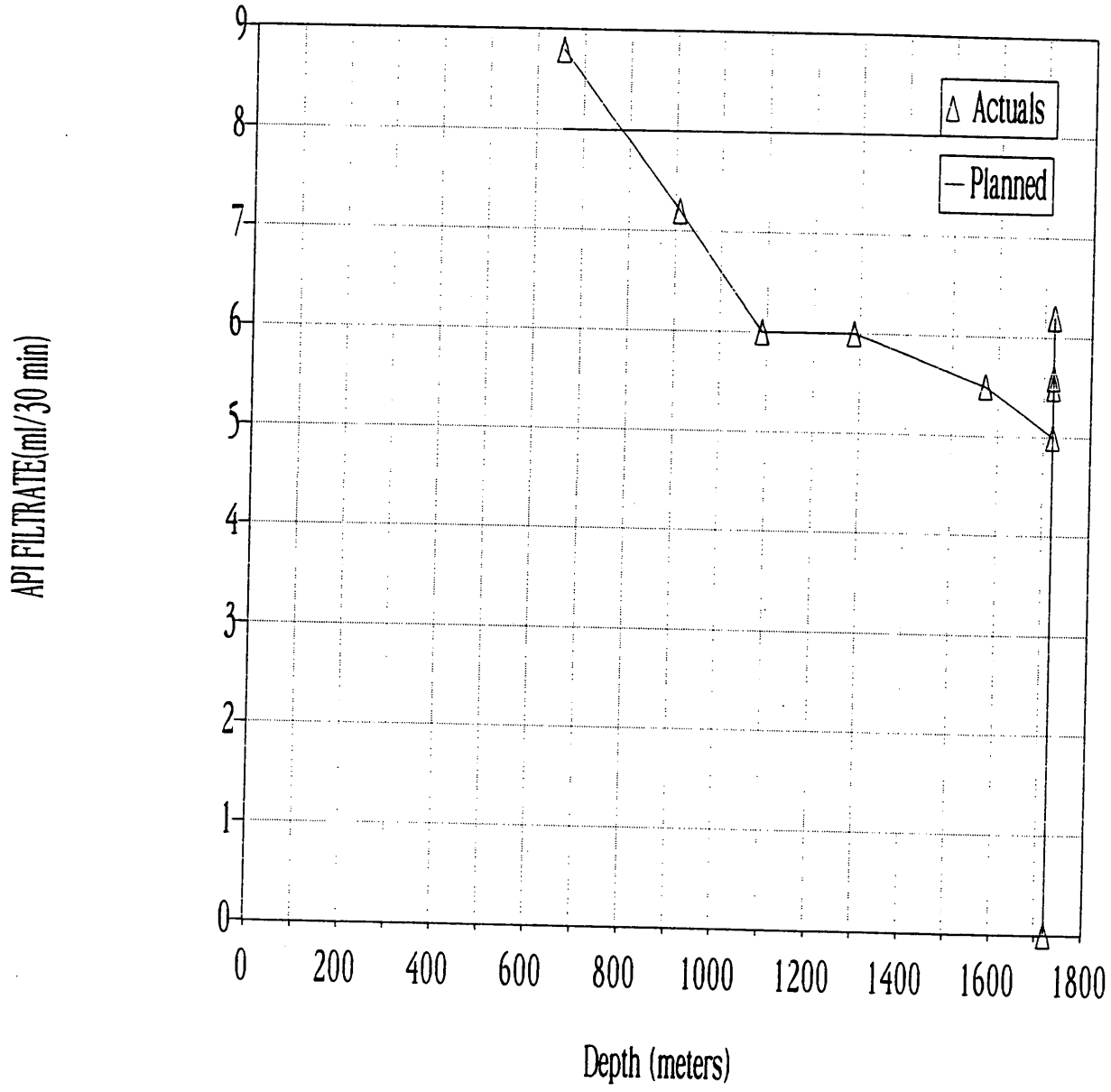
Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.		AUSTRALIA
Well Name:	IONA-5 STI	Geo. Area:	OTWAY BASIN
Contractor:	O. D. & E.	Field:	PPL 2
Rig:	Rig 30	Region:	Victoria

Depth vs. Mud Weight



Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	intry:	AUSTRALIA
Well Name:	IONA-S ST1	Geo. Area:	OTWAY BASIN
Contractor:	O. D. & E.	Field:	PPL 2
Rig:	Rig 30	Region:	Victoria

API FILTRATE(ml/30 min) vs Depth (meters)

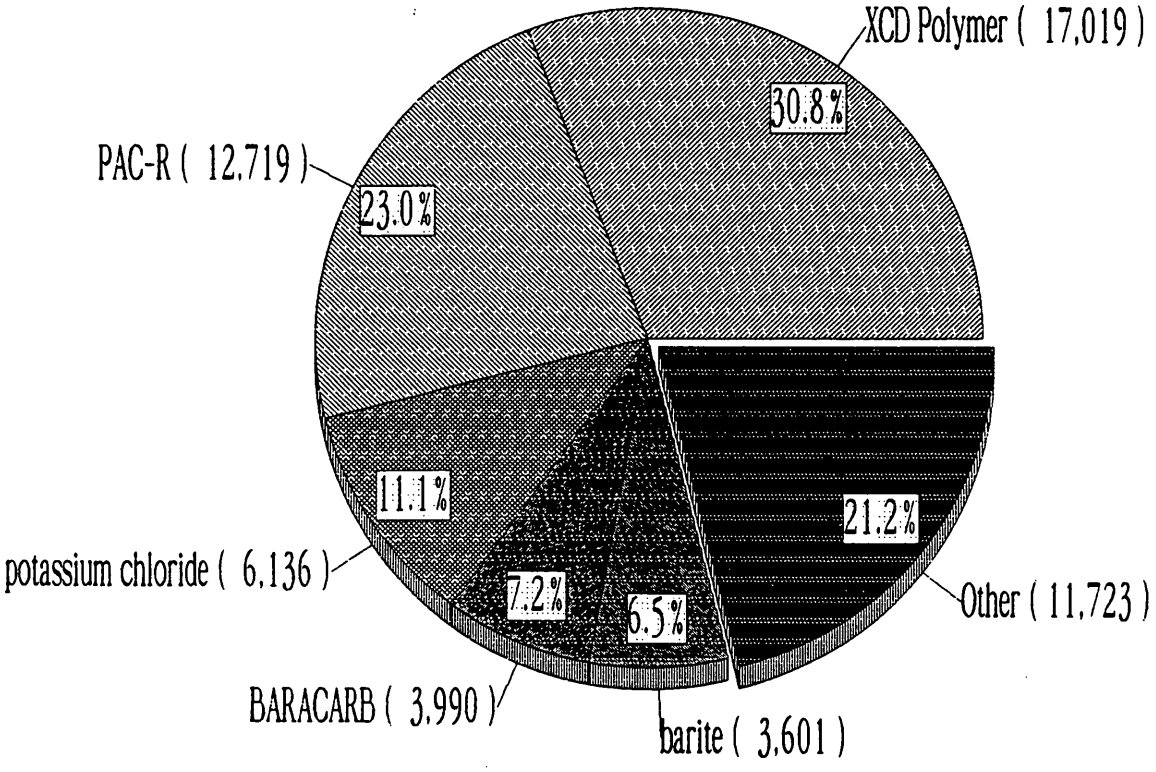


Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.		AUSTRALIA
Well Name:	IONA-5 STI	Geo. Area:	OTWAY BASIN
Contractor:	O. D. & E.	Field:	PPL 2
Rig:	Rig 30	Region:	Victoria

Usage by Product

Interval # 01 12.25 in. Hole Section

DOLLAR



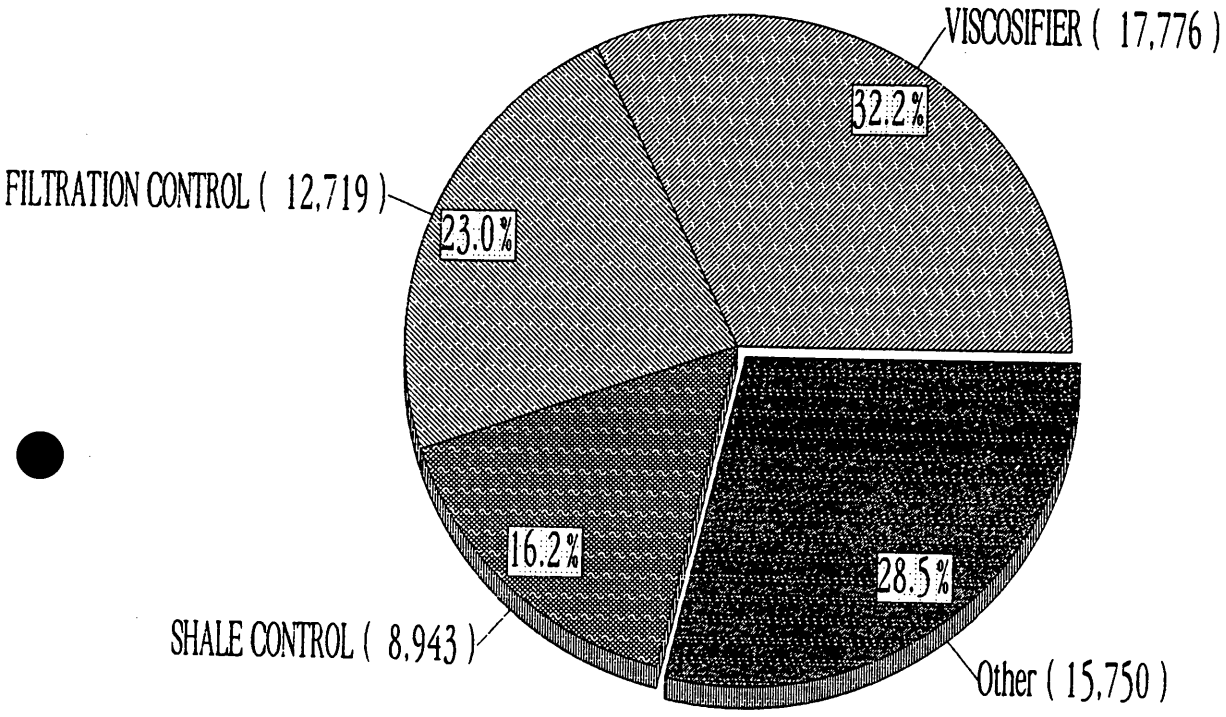
Interval Mud Cost: 55,188

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.		AUSTRALIA
Well Name:	IONA-5 ST1	Geo. Area:	OTWAY BASIN
Contractor:	O. D. & E.	Field:	PPL 2
Rig:	Rig 30	Region:	Victoria

Usage by Function

Interval # 01 12.25 in. Hole Section

DOLLAR



Interval Mud Cost: 55,188

POST WELL AUDIT

Postwell Audit

WESTERN UNDERGROUND GAS STORAGE Pty Ltd.

IONA-5 ST1

Drilling Contractor	O. D. & E.
Rig	Rig 30
Prepared by	JAMES GALLAGHER
Date	24/05/99
Internal Well Number	M0300340

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	Country:	AUSTRALIA
Well Name:	IONA-5 ST1	Geo Area:	OTWAY BASIN
Contractor:	O. D. & E.	Field:	PPL 2
Rig:	Rig 30	Region:	Victoria

Contents

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	**Country:**	AUSTRALIA
Well Name:	IONA-5 ST1	**Geo Area:**	OTWAY BASIN
Contractor:	O. D. & E.	**Field:**	PPL 2
Rig:	Rig 30	**Region:**	Victoria

Well Summary

Well data	Spud date	: 26/04/99
	TD date	: 01/05/99
	Days on well	: 14
	Drilling days	: 5
	Total measured depth	: 1,720 meters
	True vertical depth	: 1,364 meters
	Distance Drilled	: 1,064 meters
	Maximum deviation	: 60.70°
	BHT	: 58 Deg C
	Total mud cost	: $A 64,161.68
	Mud cost per meters	: $A 60.30
	Total cost	: $A 64,161.68
	Baroid Engineers	: GERALD LANGE : TUN AUNG

Casing Program	**Casing size in.**	**Shoe depth meters**
	13 3/8	656
	9 5/8	1,720

Mud type	**Interval meters**			**Hole size in.**	**Mud cost, $A**
KCl/Polymer	656	To	1720	12.25	55,189.16
Potassium Chloride brine KCl/Polymer	1720	To	1720		8,972.52

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	**Country:**	AUSTRALIA
Well Name:	IONA-5 ST1	**Geo Area:**	OTWAY BASIN
Contractor:	O. D. & E.	**Field:**	PPL 2
Rig:	Rig 30	**Region:**	Victoria

Total Material Consumption

Material	Unit size	Quantity	Total cost ($A)
AQUAGEL	25 KG. BAG	42	757.26
BARA-DEFOAM W-300	208 L. DRUM	1	880.67
BARACARB 100	25 KG. BAG	177	2,104.53
BARACARB 25	25 KG. BAG	177	1,885.05
BARACIDE	25 KG. CAN	7	1,270.08
BARACOR 129	25 KG. CAN	9	584.82
barite	25 KG. SACK	503	3,601.48
BAROFIBRE	25 LB. BAG	5	288.95
citric acid	25 KG. BAG	9	558.45
Coat-2748	208 L. DRUM	3	2,550.00
EZ-MUD DP	25 KG. BAG	16	2,807.04
KCL - Tech.	25 KG. SACK	420	5,892.60
Kwikseal Fine	40 LB. BAG	60	2,653.80
Kwikseal Medium	40 LB. BAG	10	442.30
PAC-R	25 KG. BAG	67	12,718.61
potassium chloride	25 KG. BAG	352	4,576.00
potassium chloride	1000 KG. BAG	3	1,560.00
potassium hydroxide	20 KG. PAIL	32	1,406.40
soda ash	25 KG. BAG	16	240.00
sodium bicarbonate	25 KG. BAG	7	120.12
WALL-NUT FINE	25 KG. BAG	8	244.16
XCD Polymer	25 KG. BAG	36	17,019.36

Total mud cost $A 64,161.68

Programmed mud cost $A 65,236.54

Variance $A -1,074.86

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	Country:	AUSTRALIA
Well Name:	IONA-5 ST1	Geo Area:	OTWAY BASIN
Contractor:	O. D. & E.	Field:	PPL 2
Rig:	Rig 30	Region:	Victoria

Interval Summary

Interval # 01

Bit Size	12.25 in.
Mud type(s)	KCl/Polymer
Top of interval	656.0 meters
Bottom of interval	1,720.0 meters
Maximum density	9.30 ppg
Interval start date	26/04/99
Interval end date	05/05/99
Interval days	10
Drilling days	5
Interval TD date	01/05/99
Rotating hours	77.00
Average penetration rate	13.8 meters
Maximum flowline temperature	55° Deg C
Casing size	9 5/8 in.
Maximum deviation	60.70°
Interval mud cost	$A 55,189.16
Mud cost per meters	$A 51.87
Total Interval Cost	$A 55,189.16

Company:	**WESTERN UNDERGROUND GAS STORAGE Pty Ltd.**	**Country:**	**AUSTRALIA**
Well Name:	**IONA-5 ST1**	**Geo Area:**	**OTWAY BASIN**
Contractor:	**O. D. & E.**	**Field:**	**PPL 2**
Rig:	**Rig 30**	**Region:**	**Victoria**

Interval Summary

Interval # 02

Bit Size	in.
Mud type(s)	Potassium Chloride brine KCl/Polymer
Top of interval	1,720.0 meters
Bottom of interval	1,720.0 meters
Maximum density	8.70 ppg
Interval start date	06/05/99
Interval end date	09/05/99
Interval days	4
Interval TD date	06/05/99
Maximum flowline temperature	20° Deg C
Casing size	9 5/8 in.
Maximum deviation	60.70°
Interval mud cost	$A 8,972.52
Mud cost per meters	$A 8,972.52
Total Interval Cost	$A 8,972.52

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	Country:	AUSTRALIA
Well Name:	IONA-5 ST1	Geo Area:	OTWAY BASIN
Contractor:	O. D. & E.	Field:	PPL 2
Rig:	Rig 30	Region:	Victoria

Interval Material Consumption

Interval #01 12.25 in. Hole Section

Top of Interval 656 meters
Bottom of Interval 1,720 meters

Material	Unit size	Quantity	Total cost ($A)
AQUAGEL	25 KG. BAG	42	757.26
BARACARB 100	25 KG. BAG	177	2,104.53
BARACARB 25	25 KG. BAG	177	1,885.05
BARACIDE	25 KG. CAN	7	1,270.08
BARACOR 129	25 KG. CAN	9	584.82
barite	25 KG. SACK	503	3,601.48
BAROFIBRE	25 LB. BAG	5	288.95
citric acid	25 KG. BAG	9	558.45
EZ-MUD DP	25 KG. BAG	16	2,807.04
KCL - Tech.	25 KG. SACK	25	350.75
Kwikseal Fine	40 LB. BAG	60	2,653.80
Kwikseal Medium	40 LB. BAG	10	442.30
PAC-R	25 KG. BAG	67	12,718.61
potassium chloride	25 KG. BAG	352	4,576.00
potassium chloride	1000 KG. BAG	3	1,560.00
potassium hydroxide	20 KG. PAIL	32	1,406.40
soda ash	25 KG. BAG	16	240.00
sodium bicarbonate	25 KG. BAG	7	120.12
WALL-NUT FINE	25 KG. BAG	8	244.16
XCD Polymer	25 KG. BAG	36	17,019.36

Interval mud cost	$A 55,189.16
Programmed mud cost	$A 65,236.54
Variance	$A -10,047.38

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	**Country:**	AUSTRALIA
Well Name:	IONA-5 ST1	**Geo Area:**	OTWAY BASIN
Contractor:	O. D. & E.	**Field:**	PPL 2
Rig:	Rig 30	**Region:**	Victoria

Interval Material Consumption

Interval #02 in. Hole Section

Top of Interval 1,720 meters
Bottom of Interval 1,720 meters

Material	Unit size	Quantity	Total cost ($A)
BARA-DEFOAM W-300	208 L. DRUM	1	880.67
Coat-2748	208 L. DRUM	3	2,550.00
KCL - Tech.	25 KG. SACK	395	5,541.85

Interval mud cost $A 8,972.52

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	**Country:**	AUSTRALIA
Well Name:	IONA-5 ST1	**Geo Area:**	OTWAY BASIN
Contractor:	O. D. & E.	**Field:**	PPL 2
Rig:	Rig 30	**Region:**	Victoria

Daily Mud Volume Record

HOLE SIZE:12.25 in. **MUD TYPE:KCl/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
26/04/99	0	817	0	0	0	0	817	817	25	0	25	25	0	792	302	490	0
27/04/99	792	0	0	393	0	7	400	1,217	265	0	265	290	0	927	427	450	50
28/04/99	927	0	0	435	0	15	450	1,667	40	0	40	330	0	1,018	514	440	64
29/04/99	1,018	0	0	280	0	10	300	1,967	30	0	30	360	0	1,113	593	406	114
30/04/99	1,113	0	0	368	0	32	400	2,367	40	0	40	400	0	1,244	726	406	112
01/05/99	1,244	0	0	84	0	16	100	2,467	0	0	0	400	0	1,167	792	326	49
02/05/99	1,167	0	0	0	0	2	2	2,469	0	0	0	400	0	1,119	792	304	23
03/05/99	1,119	0	0	0	0	2	2	2,471	0	0	0	400	0	1,098	797	284	17
04/05/99	1,098	0	0	89	0	11	100	2,571	0	0	0	400	0	1,141	792	302	47
05/05/99	1,141	0	0	413	0	0	413	2,984	741	0	741	1,141	0	813	413	0	400

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Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	**Country:**	AUSTRALIA
Well Name:	IONA-5 ST1	**Geo Area:**	OTWAY BASIN
Contractor:	O. D. & E.	**Field:**	PPL 2
Rig:	Rig 30	**Region:**	Victoria

Daily Mud Volume Record

HOLE SIZE:in. **MUD TYPE:KCl/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
08/05/99	813	0	0	480	0	20	500	500	413	0	413	413	0	900	374	126	400

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	Country:	AUSTRALIA
Well Name:	IONA-5 ST1	Geo Area:	OTWAY BASIN
Contractor:	O. D. & E.	Field:	PPL 2
Rig:	Rig 30	Region:	Victoria

Daily Mud Volume Record

HOLE SIZE:in. **MUD TYPE:Potassium Chloride brine**

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
07/05/99	900	0	0	92	0	3	95	95	0	0	0	0	0	908	413	95	400
08/05/99	908	0	0	223	0	7	230	325	0	0	0	0	0	1,080	355	325	400
09/05/99	1,080	0	0	0	0	0	0	325	0	0	0	0	0	755	355	0	400

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	**Country:**	AUSTRALIA
Well Name:	IONA-5 ST1	**Geo Area:**	OTWAY BASIN
Contractor:	O. D. & E.	**Field:**	PPL 2
Rig:	Rig 30	**Region:**	Victoria

Mud Program Exceptions Report

DATE	TIME	DEPTH meters	PROPERTY	UNITS	EXCEPTION	PROGRAM MINIMUM	PROGRAM MAXIMUM	ACTUAL	PROBLEM
04/26/99	23:45	656	API FILTRATE	ml/30 min	HIGH		8.0	8.8	
		656	PH		HIGH	8.5	9.2	10.0	
		656	6 rpm		LOW	10.0		7.0	
	16:00	656	API FILTRATE	ml/30 min	HIGH		8.0	8.4	
		656	PH		LOW	8.5	9.2	8.1	
04/27/99	22:10	910	6 rpm		LOW	10.0		9.0	
	16:20	830	6 rpm		LOW	10.0		7.0	
	11:00	744	API FILTRATE	ml/30 min	HIGH		8.0	9.2	
		744	PH		HIGH	8.5	9.2	10.0	
		744	6 rpm		LOW	10.0		7.0	
04/28/99	22:15	1090	KCl Content	ppb	HIGH	10.5	14.0	14.3	
	15:25	989	6 rpm		LOW	10.0		8.0	
	09:45	964	PH		HIGH	8.5	9.2	9.5	
		964	6 rpm		LOW	10.0		7.0	
04/29/99	20:15	1287	PH		HIGH	8.5	9.2	9.4	
	16:00	1249	PH		HIGH	8.5	9.2	9.4	
	10:00	1211	PH		HIGH	8.5	9.2	9.5	
		1211	6 rpm		LOW	10.0		9.0	
		1211	KCl Content	ppb	HIGH	10.5	14.0	14.3	
04/30/99	17:00	1535	6 rpm		LOW	10.0		9.0	

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	**Country:**	AUSTRALIA
Well Name:	IONA-5 ST1	**Geo Area:**	OTWAY BASIN
Contractor:	O. D. & E.	**Field:**	PPL 2
Rig:	Rig 30	**Region:**	Victoria

Mud Property Recap:Water-Based Mud

DATE	DEPTH	F/L TEMP	DENSITY	FUN VIS	RHEOLOGY @ 120°F			FILTRATION				pH	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
26/04/99	656	32	9.0	45	11.0	18.0	7.0/ 15.0	8.8		1/0	121	10.00	0.90	0.20	1.00	22,000	880.0	0.5	3.74	3.74		95.00	11.50	40 / 29	25 / 18	7 / 5
27/04/99	928	46	8.9	47	13.0	26.0	7.0/ 14.0	7.2		1/0	121	8.70	0.65	0.08	0.65	22,000	400.0	1.0	3.23	3.23		95.50	10.00	52 / 39	32 / 24	9 / 7
28/04/99	1116	47	9.1	63	20.0	37.0	8.0/ 20.0	6.0	16.00	1/2	121	9.20	0.60	0.08	0.45	23,500	160.0	1.5	4.26	4.26		94.40	10.00	77 / 57	47 / 35	11 / 8
29/04/99	1287	54	9.0	58	20.0	36.0	8.0/ 17.0	6.0	17.60	1/2	121	9.40	0.40	0.08	0.50	23,000	100.0	1.0	3.68	3.68		95.00	9.00	75 / 55	44 / 33	10 / 7
30/04/99	1577	61	9.2	63	20.0	32.0	8.0/ 20.0	5.5	15.20	1/2	121	8.50	0.15	0.04	0.40	19,500	160.0	0.8	5.30	5.30		93.60	9.00	72 / 52	43 / 31	10 / 7
01/05/99	1720	55	9.3	61	20.0	35.0	9.0/ 23.0	5.0	14.60	1/2	121	8.90	0.30	0.05	0.50	19,000	120.0	0.5	5.73	5.43		93.20	10.50	75 / 55	45 / 33	10 / 8
02/05/99	1720	50	9.3	66	20.0	32.0	9.0/ 23.0	5.5	15.40	1/2	121	8.90	0.30	0.05	0.45	18,500	120.0	0.5	5.68	5.28		93.30	10.00	72 / 52	43 / 31	10 / 8
03/05/99	1720	27	9.2	61	15.0	23.0	6.0/ 15.0	5.6	15.60	1/2	121	8.60	0.20	0.05	0.50	18,500	120.0	0.5	5.37	5.30		93.70	9.00	63 / 38	31 / 22	7 / 5
04/05/99	1720	47	9.2	54	13.0	20.0	7.0/ 23.0	6.2	16.40	1/2	121	8.50	0.15	0.04	0.60	17,500	140.0	0.5	5.21	5.05		93.80	8.00	46 / 33	26 / 20	7 / 5
05/05/99	1720	45	9.3	56	1.0		/				121													/	/	/
06/05/99	1720	20	8.7	27	1.0		/				121					35,000								/	/	/
07/05/99	1720	20	8.7	27	1.0		/				121					35,000								/	/	/
08/05/99	1720	20	8.7	27	1.0		/				121					35,000								/	/	/
09/05/99	1720	20	8.6	27	1.0		/			2/0	121					35,000								/	/	/

Company:	WESTERN UNDERGROUND GAS STORAGE Pty Ltd.	Country:	AUSTRALIA
Well Name:	IONA-5 ST1	Geo Area:	OTWAY BASIN
Contractor:	O. D. & E.	Field:	PPL 2
Rig:	Rig 30	Region:	Victoria

Daily Operations Log

DATE	DEPTH meters	OPERATION
26/04/99	656	**DRILLING OUT SHOE** Drilling IONA-5ST on the 26/4/99. Nippled up and test BOP's. Pick up 12.25" ì bit and BHA. Test MWD, RIH. Tag cement at ì 625m, drilling out the shoe track at report ì time.
27/04/99	928	**DRILLING** Drilled out the shoe track and 4m of ì formation to 660m. Circulate hole clean, Ran ì FIT, 10.9 ppg EMW. Changed 1 broken shaker screen. Drilling ahead at 928m. Survey each ì connection.
28/04/99	1,116	**TRIP. DRILL.** Drilled to 963 m, swept hole with 40 bbls of LCM pill, light increase in cuttings over shakers. Slug pipe, POOH. Layed down mud motor, pick up rotating assembly, RIH to 847 m (tight).Wash/ream 847 -963 m. Drill from 963 m to 1116 m.
29/04/99	1,287	**DRILL. TRIP.** Drill from 1116 m to 1287 m in Skullcreek ì formation (mainly clays). Pump 40 bbl of Hi-Vis LCM sweep. Fair ì increase of returns.Circulate clean. Trip for bit.
30/04/99	1,577	**DRILL.** Trip out for bit. Run in hole to 1287 m. Break in PDC bit and drill from 1287 m (Skullcreek formation) at high ROP of 40-60 m/hr. Pump 40 bbl of LCM sweep (8 ppb). At 1468 m, circulate and work string due to overpull of 20-25 K, likely due to cuttings building up. Started trickling in Baracarb at 1523 m,in the middle of the Belfast formation. ROP of 40-45 m/hr in the Belfast fm, which later slowed down due to hard stringers. Continued drilling through the ì Belfast fm to 1577 m.
01/05/99	1,720	**TD. WIPER TRIP.POOH.** Drilled from 1577 m in Belfast, through Warre fm to T.D of 1720 m. Pump 40 bbl of LCM/Polymer sweep(fair increase of ctgs). Trip to 1427 m, tight hole.Work @ 1435 m, circulate clean. Pull out to 1350 m, tight. Circulate clean. Pull out to 1040 m, tight. Work tight spot @ 1018 m.Pump 40 bbl LCM/Pol ymer sweep, large amount of ctgs. Pull to shoe.Run in to 1703 m, precautionary wash/ream to 1720 m.Large amt ctgs.Pump 40 bbl LCM/Polymer sweep, moderate amt of ctgs. Circulate 2 x Bottoms up. Drop gyro. POOH.

908215 289

Company: WESTERN UNDERGROUND GAS STORAGE Pty Ltd.
Well Name: IONA-5 ST1
Contractor: O. D. & E.
Rig: Rig 30

Country: AUSTRALIA
Geo Area: OTWAY BASIN
Field: PPL 2
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
/ /		0.00															
26/04/99	1	12.25	SMITH	O2M	1 X 12, 3	1287	831	52	52		0		0/0				
30/04/99	2	12.25	SECURITY	256S	5 X 18	1720	433	27	78	35	110	798	46/69	2000	9	2,E,1/16	KCL/EZ MUD/POLYMER. Heytesbury,Narrawaturk,Mepunga,Dilwyn,
										10	110	798	46/69	2000	9	1%, IN	KCL/EZ MUD/POLYMER. Pebble Point,Paaratte,Skull Creek, I

Pember, Pebble Point.
Nullawarre,Belfast, Waarre. W.

DAILY MUD REPORTS

908215 291

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 1

Date	Depth
26/04/99	656.0 m [MD]
Spud Date	Present Activity
26/04/99	DRILLING OUT SHOE

OPERATOR	CONTRACTOR	RIG NUMBER
WESTERN UNDERGROUND GAS STORA	O. D. & E.	Rig 30
REPORT FOR	REPORT FOR	REGION
Wally Westman / Jack Lambert	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-5 ST1	PPL 2	OTWAY BASIN	Austral

BIT DATA

Size 12.25 in.
Type Smith 02M
No. Jets
Jets 32nd inch
16 | 16 | 16
12
Tot Noz Area
TPA

DRILLING STRING

Pipe OD	4 1/2	ID	3.826	Len.	350.0	m
Pipe OD	5	ID	3.000	Len.	274.0	m
Pipe OD		ID		Len.		m
Collar OD	8	ID	3.0	Len.	32.0	m
Collar OD		ID		Len.		m

OPEN HOLE

Size	Len.	m
Size	Len.	m
Size	Len.	m
Size	Len.	m
Size	Len.	m

CASING

in.	m
13 3/8 Set @	656.0
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	

CIRCULATION DATA

Pump Make/Model	Gard-Denv. PZ-8		
Size 6 X 8	Eff. 97.00	V/pt	0.068
spm 135	bbl/min 9.2		
Pump Make/Model	Gard-Denv. PZ-8		
Size 6 X 8	Eff. 97.00	V/pt	0.068
spm 135	bbl/min 9.2		
Pump Make/Model			
Size	Eff.	V/pt	
spm	bbl/min		
Tot. Vol./min 770	gpm 18.3	bbl	
BU Time 15	TC Time 43		

MUD PROPERTIES

Source	Primary Flowline	2 Pits, Uncr	3	Program Targets *=Excep P	2	3	Essential Program Properties 655.9	1699.9
Time	23:45	16:00						
PL Temp Deg C	32	0						
Depth m	656.0	656.0						
Weight ppg	9.0	9.0					<	9.4
FV @ 28 Deg C sec/qt	45	48						
PV @ 49 Deg C cP	11	12					<	30
YP lbs/100 ft2	18	22						
Gels lbs/100 ft2	7/15	8/16						
API Filt. ml/30 min	8.8	8.4		*	*		<	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	3.7	3.7						
Oil/Water % by vol	0.0/95.0	0.0/95.0						
Sand % by vol	0.5	0.5						
MBT	11.5	11.5						
pH STRIP	10.0	8.1		*	*		8.5	9.2
Alk. Mud (Pm)	0.90	0.20						
Alk. Filtr. (Pf/Mf)	0.20/1.00	0.03/0.50						
Chlorides mg/l	22000	23000						
Hard. Ca mg/l	880	640						
Low Gravity Solids ppb	34.03	33.49					<	75.00

MUD TREATMENTS

Drilling out the shoe track, conditioned mud with Citric Acid and Bicarb. of Soda. Running centrifuge and desilter.

KCL % wt = 3.9 / 4.0

RIG ACTIVITY

Drilling IONA-5ST on the 26/4/99.

Nippled up and test BOP's. Pick up 12.25" bit and BHA. Test MWD, RIH. Tag cement at 625m, drilling out the shoe track at report time.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
citric acid - 25 KG. BAG	5	310.25			
sodium bicarbonate - 25 KG.	7	120.12			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE-LM	3x110	1
Shkr #2	DFE-LM	3x110	1
dSlt #1	Harrisburg	12 * 4	1
Cent #1	DFE	Hi-Vol	1

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
302	490
Active Volume	
792	
Reserve	Total
	792

Low Grav, vol % 3.7
ppb 34.03
High Grav, vol % 0.0
ppb 0.00
ASG 2.64
Drill Cuttings 314
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	817
Barite	0
Chemicals	0
LOSSES	bbl
Dumped	25
Lost	0
VOL GAIN/LOSS	792

RHEOLOGY AND HYDRAULICS

600 rpm	40	46
300 rpm	29	34
200 rpm	25	29
100 rpm	18	22
6 rpm	7	10
3 rpm	5	8

Pressure Units: psig
Press Drop, DP 949
Press Drop, BIT 997
Press Drop, ANN 27
Actual Circ. Press 1750
AV, DP m/min 42.2
AV, DC m/min 62.1
AV, Riser m/min

FRACTURE GRADIENT

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

DEVIATION INFO

MD	656.0	m
TVD	656.0	m
Angle	0.00	
Direction		
Horiz. Displ	0.0	m

TIME

DRLG	0.00
CIRC	1.00
TRIPS	5.50
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	0.00
TESTING	0.00
OTHER	17.50
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	(03) 9621 3311	DAILY COST	CUMULATIVE COST
Gerald Lange	WAREHOUSE	Welshpool	TELEPHONE	(03) 5688 1445	$A 430.37	$A 430.37

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

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Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 3

Date	Depth
28/04/99	1116.0m [MD]
Spud Date	Present Activity
26/04/99	TRIP. DRILL.

OPERATOR	CONTRACTOR	RIG NUMBER
WESTERN UNDERGROUND GAS STORA	O. D. & E.	Rig 30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman / Jack Lambert	Nick Horsburgh	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-5 ST1	PPL 2	OTWAY BASIN	Austral

BIT DATA

Size 12.25 in.
Type Smith 02M
No. Jets
Jets 32nd inch
16 16 16
12
Tot Noz Area
TFA

DRILLING STRING

Pipe OD	4 1/2	ID	3.826	Len.	823.6
Pipe OD	5	ID	3.000	Len.	263.9
Pipe OD		ID		Len.	
Collar OD	8	ID	3.0	Len.	28.5
Collar OD		ID		Len.	

OPEN HOLE

Size 12.25 Len. 460.0
Size Len.
Size Len.
Size Len.
Size Len.

CASING

13 3/8 Set @ 656.0 m
Set @
Set @
Set @
Set @
Set @
Set @
Set @

CIRCULATION DATA

Pump Make/Model	Gard-Denv. PZ-8		
Size 6 X 8	Eff. 97.00	V/gt	0.068
spm 138	bbl/min 9.4		
Pump Make/Model	Gard-Denv. PZ-8		
Size 6 X 8	Eff. 97.00	V/gt	0.068
spm 138	bbl/min 9.4		
Pump Make/Model			
Size	Eff.	V/gt	
spm	bbl/min		
Tot. Vol./min	787 gpm	18.7	bbl
BU Time 25	TC Time 51		

MUD PROPERTIES

Source		Primary Flowline	2 Flowline	3 Pits, Uncr	Program Targets *=Excep P	2	3	Essential Program Properties	
Time		22:15	15:25	09:45					
FL Temp	Deg C	47	44	38					
Depth	m	1090.0	989.0	964.0				655.9	1699.9
Weight	ppg	9.1	9.0	8.9				<	9.4
FV @ 38 Deg C	sec/qt	63	50	47					
PV @ 49 Deg C	cP	20	16	14				<	30
YP	lbs/100 ft2	37	26	20					
Gels	lbs/100 ft2	8/20	7/12	6/12					
API Filt.	ml/30 min	6.0	6.5	6.8				<	8.0
HTHP @ 121 Deg C	ml/30 min	18.0	18.4	19.0					
Cake API/HTHP	32nd in	1/2	1/2	1/2					
Corr.Solids % by vol		4.3	3.7	3.2					
Oil/Water % by vol		0.0/94.4	0.0/95.0	0.0/95.5					
Sand % by vol		1.5	1.0	0.5					
MBT		10.0	8.0	10.0					
pH STRIP		9.2	8.8	9.5			*	8.5	9.2
Alk. Mud (Pm)		0.60	0.70	0.70					
Alk. Filtr. (Pf/Mf)		0.08/0.45	0.05/0.40	0.10/0.70					
Chlorides mg/l		23500	22500	22000					
Hard. Ca mg/l		160	320	360					
Low Gravity Solids	ppb	38.77	33.76	29.39				<	75.00
6 rpm		11	8	7		*	*	10.00	>
KCl Content	ppb	14.3	14.0	12.25	*			10.50	14.00

MUD TREATMENTS

Running desilter and centrifuge continuously even during tripping.
KCL % wt :4.1 /4.0 / 3.5
Sand in % :0.75 / 0.5 / 0.5
Added Prehydrated Gel into new premixes, total of 1.7 ppb on system.

RIG ACTIVITY

Drilled to 963 m, swept hole with 40 bbls of LCM pill, light increase in cuttings over shakers. Slug pipe, POOH. Layed down mud motor, pick up rotating assembly, RIH to 847 m (tight).Wash/ream 847 -963 m. Drill from 963 m to 1116 m.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
AQUAGEL - 25 KG. BAG	30	540.90			
BARACOR 129 - 25 KG. CAN	1	64.98			
EZ-MUD DP - 25 KG. BAG	4	701.76			
PAC-R - 25 KG. BAG	18	3416.94			
XCD Polymer - 25 KG. BAG	2	945.52			
barite - 25 KG. SACK	35	250.60			
potassium chloride - 25 KG.	120	1560.00			
potassium hydroxide - 20 KG.	4	175.80			
soda ash - 25 KG. BAG	8	120.00			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE-LM	3x110	24
Shkr #2	DFE-LM	3x110	24
dSlt #1	Harrisburg	12 * 4	24
Cent #1	DFE	Hi-Vol	24

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
514	440
Active Volume	
954	
Reserve	Total
64	1018

Low Grav, vol % 4.3
ppb 38.77
High Grav, vol % 0.0
ppb 0.00
ASG 2.69
Drill Cuttings 90
Dilution Rate 0.62
Slds Control Eff 85.00

MUD TYPE

KCL/EZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	435
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	15
LOSSES	bbl
Dumped	40
Lost	319
VOL GAIN/LOSS	91

RHEOLOGY AND HYDRAULICS

600 rpm	77	58	48
300 rpm	57	42	34
200 rpm	47	35	28
100 rpm	35	25	20
6 rpm	11	8	7
3 rpm	8	6	5

Pressure Units: psig
Press Drop. DP 1484
Press Drop, BIT 1053
Press Drop, ANN 92
Actual Circ. Press 1800
AV, DP m/min 43.1
AV, DC m/min 68.4
AV, Riser m/min

FRACTURE GRADIENT

Water Depth
Calc. P. Grad 0.0
Leak Off Test 10.9
ECD ppg
Csg. Shoe 9.6
TD 9.6
Max. Diff. Press 0

DEVIATION INFO

MD 1116.0 m
TVD 1025.0 m
Angle 52.30
Direction 262.0
Horiz. Displ 93.5 m

TIME

DRLG	12.00
CIRC	1.00
TRIPS	8.00
SERV. RIG	0.50
SURVEY	0.00
FISHING	0.00
LOGGING	0.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	2.50
TESTING	0.00
OTHER	0.00
AVERAGE ROP	15.67

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	(03) 9621 3311	DAILY COST	CUMULATIVE COST
Tun Aung	WAREHOUSE	Welshpool	TELEPHONE	(03) 5688 1445	$A 7776.50	$A 18775.75

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

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Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 5

Date	Depth
30/04/99	1577.0m [MD]
Spud Date	Present Activity
26/04/99	DRILL.

OPERATOR	CONTRACTOR	RIG NUMBER
WESTERN UNDERGROUND GAS STORA	O. D. & E.	Rig 30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman / Jack Lambert	Ken Malone	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-5 ST1	PPL 2	OTWAY BASIN	Austral

BIT DATA

Size 12.25 in.
Type Security 256S
No. Jets
Jets 32nd inch
18 | 18 | 18
18 | 18 |
Tot Noz Area
TFA

DRILLING STRING (in. / m)

Pipe OD 4 1/2 ID 3.826 Len. 1284.6
Pipe OD 5 ID 3.000 Len. 263.9
Pipe OD ID Len.
Collar OD 8 ID 3.0 Len. 28.5
Collar OD ID Len.

OPEN HOLE (in. / m)

Size 12.25 Len. 921.0
Size Len.
Size Len.
Size Len.

CASING

in.	m
13 3/8 Set @	656.0
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	

CIRCULATION DATA

Pump Make/Model Gard-Denv. PZ-8
Size 6 X 8 Eff. 97.00 V/st 0.068
spm 140 bbl/min 9.5
Pump Make/Model Gard-Denv. PZ-8
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 35 TC Time 60

MUD PROPERTIES

		Primary	2	3	Program	Essential
Source		Pits, Circ	Pits, Circ	Pits, Circ	Targets	Program
Time		23:30	17:00	10:30	*=Excep	Properties
FL Temp	Deg C	51	50	47	P 2 3	655.9 1699.9
Depth	m	1573.0	1535.0	1411.0		
Weight	ppg	9.2	9.2	9.1		< 9.4
FV @ 42 Deg C	sec/qt	63	59	68		
PV @ 49 Deg C	cP	20	19	23		< 30
YP	lbs/100 ft2	32	30	39		
Gels	lbs/100 ft2	8/20	7/20	9/24		
API Filt.	ml/30 min	5.5	5.6	5.2		< 8.0
HTHP @ 121 Deg C	ml/30 min	15.2	15.4	14.6		
Cake API/HTHP	32nd in	1/2	1/2	1/2		
Corr.Solids % by vol		5.3	5.1	4.3		
Oil/Water % by vol		0.0/93.6	0.0/93.8	0.0/94.4		
Sand % by vol		0.6	0.6	0.6		
MBT		9.0	9.0	10.0		
pH STRIP		8.5	8.5	8.6		8.5 9.2
Alk. Mud (Pm)		0.15	0.15	0.20		
Alk. Filtr. (Pf/Mf)		0.04/0.40	0.03/0.40	0.05/0.50		
Chlorides mg/l		19500	20000	23000		
Hard. Ca mg/l		180	200	160		
Low Gravity Solids	ppb	48.23	44.86	39.04		< 75.00
6 rpm		10	9	11	*	10.00 >
KCl Content	ppb	12.3	12.6	14.0		10.50 14.00
KCl Content	% wt	3.5	3.6	4.0		

MUD TREATMENTS

Running Desilter / Centrifuge continously.
Sand % (In) : 0.3 / 0.6 / 0.6

Once out of the clays in the Skullcreek formation, the MBT and rheology started dropping. Started trickling in 5 ppb each of Baracarb #25 and #100 at 1523 m in the middle of the Belfast formation.
Adding Baracide to preserve mud during logging.

RIG ACTIVITY

Trip out for bit. Run in hole to 1287 m. Break in PDC bit and drill from 1287 m (Skullcreek formation) at high ROP of 40-60 m/hr. Pump 40 bbl of LCM sweep (8 ppb). At 1468 m, circulate and work string due to overpull of 20-25 K, likely due to cuttings building up. Started trickling in Baracarb at 1523 m, in the middle of the Belfast formation. ROP of 40-45 m/hr in the Belfast fm, which later slowed down due to hard stringers. Continued drilling through the Belfast fm to 1577 m.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACARB 25 - 25 KG. BAG	138	1469.70	potassium chloride - 25 KG.	100	1300.00
BARACARB 100 - 25 KG. BAG	138	1640.82	potassium hydroxide - 20 KG.	5	219.75
BARACIDE - 25 KG. CAN	2	362.88			
BARACOR 129 - 25 KG. CAN	2	129.96			
EZ-MUD DP - 25 KG. BAG	4	701.76			
Kwikseal Fine - 40 LB. BAG	10	442.30			
PAC-R - 25 KG. BAG	12	2277.96			
WALL-NUT FINE - 25 KG. BAG	8	244.16			
XCD Polymer - 25 KG. BAG	10	4727.60			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE-LM	3x110	22
Shkr #2	DFE-LM	3x110	22
dSlt #1	Harrisburg	12 * 4	24
Cent #1	DFE	Hi-Vol	24

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
726	406

Active Volume: 1132

Reserve	Total
112	1244

Low Grav, vol % 5.3
ppb 48.23
High Grav, vol % 0.0
ppb 0.00
ASG 2.67
Drill Cuttings 139
Dilution Rate 0.48
Slds Control Eff 85.00

MUD TYPE

KCL/EZ MUD/POLYMER

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	368
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	32
LOSSES	bbl
Dumped	40
Lost	229
VOL GAIN/LOSS	131

RHEOLOGY AND HYDRAULICS

600 rpm	72	68	85
300 rpm	52	49	62
200 rpm	43	40	52
100 rpm	31	29	38
6 rpm	10	9	11
3 rpm	7	6	8

Pressure Units: psig
Press Drop. DP 1938
Press Drop, BIT 347
Press Drop, ANN 113
Actual Circ. Press 1950
AV, DP m/min 43.8
AV, DC m/min 69.3
AV, Riser m/min

FRACTURE GRADIENT

Water Depth
Calc. F. Grad 0.0
Leak Off Test 10.9
ECD ppg
Csg. Shoe 9.6
TD 9.6
Max. Diff. Press 0

DEVIATION INFO

MD 1577.0 m
TVD 1291.0 m
Angle 57.80
Direction 265.5
Horiz. Displ 579.5 m

TIME

DRLG	16.50
CIRC	1.00
TRIPS	5.00
SERV. RIG	0.50
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	1.00
AVERAGE ROP	17.58

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	(03) 9621 3311	DAILY COST	CUMULATIVE COST
Tun Aung	WAREHOUSE	Welshpool	TELEPHONE	(03) 5688 1445	$A 13516.89	$A 39585.13

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908215 294

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 7

Date	Depth
02/05/99	1720.0m [MD]
Spud Date	Present Activity
26/04/99	LOG.WIPER TRIP. LOG

OPERATOR	CONTRACTOR	RIG NUMBER
WESTERN UNDERGROUND GAS STORA	O. D. & E.	Rig 30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman / Jack Lambert	Ken Malone	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-5 ST1	PPL 2	OTWAY BASIN	Austral

BIT DATA

Size 12.25 in.	
Type Smith, O2M	
No. Jets	
Jets 32nd inch	
Tot Noz Area	
TFA	

DRILLING STRING (in. / m)

Pipe OD	4 1/2	ID	3.826	Len.	1427.6
Pipe OD	5	ID	3.000	Len.	263.9
Pipe OD		ID		Len.	
Collar OD	8	ID	3.0	Len.	28.5
Collar OD		ID		Len.	

OPEN HOLE (in. / m)

Size	12.25	Len.	1064.0
Size		Len.	
Size		Len.	
Size		Len.	
Size		Len.	

CASING (in. / m)

13 3/8 Set @	656.0
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	

CIRCULATION DATA

Pump Make/Model	Gard-Denv. PZ-8		
Size 6 X 8	Eff. 97.00	V/st	0.068
spm 140	bbl/min		9.5
Pump Make/Model	Gard-Denv. PZ-8		
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 38	TC Time 58		

MUD PROPERTIES

	Primary 2	3
Source	Flowline	
Time	14:40	
FL Temp Deg C	50	
Depth m	1720.0	
Weight ppg	9.3	
PV @ 50 Deg C sec/qt	68	
PV @ 49 Deg C cP	20	
YP lbs/100 ft2	32	
Gels lbs/100 ft2	9/23	
API Filt. ml/30 min	5.5	
HTHP @ 121 Deg C ml/30 min	15.4	
Cake API/HTHP 32nd in	1/2	
Corr.Solids % by vol	5.7	
Oil/Water % by vol	0.0/93.3	
Sand % by vol	0.5	
MBT	10.0	
pH STRIP	8.9	
Alk. Mud (Pm)	0.30	
Alk. Filtr. (Pf/Mf)	0.05/0.45	
Chlorides mg/l	18500	
Hard. Ca mg/l	120	
Low Gravity Solids ppb	47.87	
6 rpm	10	
KCl Content ppb	11.5	
KCl Content % wt	3.3	

Program Targets *=Excep — P 2 3 — Essential Program Properties

MUD TREATMENTS

Ran Centrifuge continously. Desilter not run due to frequently losing prime because of lower mud volume.
Pumped 40 bbl of LCM/Polymer sweep (10 ppb, 1 ppb).
Some inventory adjustments today.

RIG ACTIVITY

POOH. Rig up and run Log #1. Could not pass 1500 m. Run in for wiper trip to 1465 m. Wash and ream to 1478 m. Run in hole washing/reaming at 1484-1506 m, 1513-1535 m, and from 1703-1720 m, no fill. Moderate amount of cuttings. Pump 40 bbl of LCM/ Poly sweep, lesser amount of cuttings than previous. Slug pipe. POOH. Run Log #1 again, held up at 1480 m. Logged up. Shortened logging tool. Run in Log #2.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
AQUAGEL - 25 KG. BAG	2	36.06			
BARACIDE - 25 KG. CAN	1	181.44			
BARAFIBRE - 25 LB.	5	288.95			
Kwikseal Fine - 40 LB. BAG	12	530.76			
PAC-R - 25 KG. BAG	5	949.15			
potassium hydroxide - 20 KG.	3	131.85			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE-LM	3x110	7
Shkr #2	DFE-LM	3x110	7
dSlt #1	Harrisburg	12 * 4	
Cent #1	DFE	Hi-Vol	23

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
792	304
Active Volume	
1096	
Reserve	Total
23	1119

Low Grav, vol %	5.3
ppb	47.87
High Grav, vol %	0.4
ppb	5.88
SG	2.79
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	2
LOSSES	bbl
Dumped	0
Lost	50
VOL GAIN/LOSS	-48

RHEOLOGY AND HYDRAULICS

600 rpm	72
300 rpm	52
200 rpm	43
100 rpm	31
6 rpm	10
3 rpm	8
Pressure Units:	psig
Press Drop. DP	2080
Press Drop, BIT	0
Press Drop, ANN	123
Actual Circ. Press	0
AV, DP m/min	43.8
AV, DC m/min	69.3
AV, Riser m/min	

FRACTURE GRADIENT

Water Depth	
Calc. F. Grad	0.0
Leak Off Test	10.9
ECD ppg	
Csg. Shoe	9.7
TD	9.7
Max. Diff. Press	0

DEVIATION INFO

MD	1720.0 m
TVD	1363.6 m
Angle	60.70
Direction	265.7
Horiz. Displ	721.3 m

TIME

DRLG	0.00
CIRC	1.50
TRIPS	11.00
SERV. RIG	0.50
SURVEY	0.00
FISHING	0.00
LOGGING	10.00
RUN CSG	0.00
CORE	0.00
BACK REAM	0.00
REAMING	1.00
TESTING	0.00
OTHER	0.00
AVERAGE ROP	0.00

BAROID REPRESENTATIVE	OFFICE/HOME	Melbourne	TELEPHONE	(03) 9621 3311	DAILY COST	CUMULATIVE COST
Tun Aung	WAREHOUSE	Welshpool	TELEPHONE	(03) 5688 1445	$A 2118.21	$A 49306.19

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

908215 295

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 9

Date	Depth
04/05/99	1720.0m [MD]
Spud Date	Present Activity
26/04/99	LOG. WIPER TRIP.

OPERATOR	CONTRACTOR	RIG NUMBER
WESTERN UNDERGROUND GAS STORA	O. D. & E.	Rig 30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman / Jack Lambert	Ken Malone	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-5 ST1	PPL 2	OTWAY BASIN	Austral

BIT DATA

Size 12.25 in.	
Type	
No. Jets	
Jets 32nd inch	
Tot Noz Area	
TFA	

DRILLING STRING

Pipe OD	4 1/2	ID	3.826	Len.	1427.6
Pipe OD	5	ID	3.000	Len.	263.9
Pipe OD		ID		Len.	
Collar OD	8	ID	3.0	Len.	28.5
Collar OD		ID		Len.	

OPEN HOLE

Size	12.25	Len.	1064.0
Size		Len.	
Size		Len.	
Size		Len.	
Size		Len.	

CASING

in.	m
13 3/8 Set @	656.0
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	

CIRCULATION DATA

Pump Make/Model	Gard-Denv. PZ-8		
Size 6 X 8	Eff. 97.00	V/st	0.068
spm 140	bbl/min	9.5	
Pump Make/Model	Gard-Denv. PZ-8		
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 38	TC Time	58	

MUD PROPERTIES

Source		Primary Pits, Circ	2 Pits, Circ	3
Time		21:00	06:30	
FL Temp	Deg C	47	45	
Depth	m	1720.0	1720.0	
Weight	ppg	9.2	9.3	
FV @ 50 Deg C	sec/qt	54	70	
PV @ 49 Deg C	cP	13	19	
YP	lbs/100 ft2	20	25	
Gels	lbs/100 ft2	7/23	9/23	
API Filt.	ml/30 min	6.2	5.7	
HTHP @ 121 Deg C	ml/30 min	16.4	15.8	
Cake API/HTHP	32nd in	1/2	1/2	
Corr.Solids % by vol		5.2	5.7	
Oil/Water % by vol		0.0/93.8	0.0/93.3	
Sand % by vol		0.5	0.5	
MBT		8.0	9.0	
pH STRIP		8.5	8.7	
Alk. Mud (Pm)		0.15	0.25	
Alk. Filtr. (Pf/Mf)		0.04/0.60	0.05/0.55	
Chlorides mg/l		17500	17500	
Hard. Ca mg/l		140	120	
Low Gravity Solids ppb		45.96	48.32	
6 rpm		7	9	
KCl Content	ppb	11.2	11.2	
KCl Content	% wt	3.2	3.2	

Program Targets *=Excep	P	2	3	Essential Program Properties

MUD TREATMENTS

Mixed up 100 bbl of new premix. After velocity survey started running centrifuge.

RIG ACTIVITY

POOH after TLC logging. Run in for wiper trip to 1720 m. Circulate and transfer new mud. Slight returns at shakers. Hole clean. POOH. Run velocity survey to 1100 m,light tool, hung up at 1100 m.Run in for wiper trip. Precautionary wash to 1720 m. Circulate. Hole clean, small returns only. Clean casing.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
BARACARB 25 - 25 KG. BAG	21	223.65			
BARACARB 100 - 25 KG. BAG	21	249.69			
KCL - Tech. - 25 KG. SACK	25	350.75			
PAC-R - 25 KG. BAG	3	569.49			
XCD Polymer - 25 KG. BAG	4	1891.04			
barite - 25 KG. SACK	122	873.52			
potassium chloride - 25 KG.	2	26.00			
potassium hydroxide - 20 KG.	5	219.75			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DPE-LM	3x110	7
Shkr #2	DPE-LM	3x110	7
dSlt #1	Harrisburg	12 * 4	2
Cent #1	DPE	Hi-Vol	10

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
792	302
Active Volume	
1094	
Reserve	Total
47	1141

Low Grav, vol %	5.1
ppb	45.96
High Grav, vol %	0.2
ppb	2.94
ASG	2.73
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	89
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	11
LOSSES	bbl
Dumped	0
Lost	57
VOL GAIN/LOSS	43

RHEOLOGY AND HYDRAULICS

600 rpm	46	63
300 rpm	33	44
200 rpm	26	37
100 rpm	20	27
6 rpm	7	9
3 rpm	5	7

Pressure Units:		psig
Press Drop. DP		1892
Press Drop, BIT		0
Press Drop, ANN		77
Actual Circ. Press		0
AV, DP	m/min	43.8
AV, DC	m/min	69.3
AV, Riser	m/min	

FRACTURE GRADIENT

Water Depth	
Calc. P. Grad	0.0
Leak Off Test	10.9
ECD	ppg
Csg. Shoe	9.4
TD	9.5
Max. Diff. Press	0

DEVIATION INFO

MD	1720.0 m
TVD	1363.6 m
Angle	60.70
Direction	265.7
Horiz. Displ	721.3 m

TIME

DRLG	0.00
CIRC	7.00
TRIPS	10.50
SERV. RIG	1.00
SURVEY	0.00
FISHING	0.00
LOGGING	5.50
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) 9621 3311	DAILY COST	CUMULATIVE COST
Tun Aung	WAREHOUSE	Welshpool	TELEPHONE	(03) 5688 1445	$A 4403.85	$A 54146.84

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

Baroid Australia Pty Ltd
DRILLING MUD REPORT

REPORT NUMBER: 13

Date	Depth
08/05/99	1720.0m [MD]
Spud Date	Present Activity
26/04/99	RUN COMPLETION.

OPERATOR	CONTRACTOR	RIG NUMBER
WESTERN UNDERGROUND GAS STORA	O. D. & E.	Rig 30
REPORT FOR	**REPORT FOR**	**REGION**
Wally Westman / Jack Lambert	Ken Malone	Victoria

WELL NAME AND NUMBER	FIELD OR BLOCK	GEOGRAPHIC AREA	COUNTRY
IONA-5 ST1	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	7.0	ID	6.2	Len. 1720.0
Collar OD		ID		Len.

OPEN HOLE (m)

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

CASING

in.	m
13 3/8 Set @	656.0
9 5/8 Set @	1720.0
Set @	
Set @	
Set @	
Set @	
Set @	
Set @	

CIRCULATION DATA

Pump Make/Model	Gard-Denv. PZ-8		
Size 6 X 8	Eff. 97.00	V/st	0.068
spm 0	bbl/min	0.0	
Pump Make/Model	Gard-Denv. PZ-8		
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

		Primary	2	3	Program Targets *=Excep			Essential Program Properties
Source		Pits, Uncr			P	2	3	
Time		22:26						
FL Temp	Deg C	20						
Depth	m	1720.0						
Weight	ppg	8.7						
FV @ 20 Deg C	sec/qt	27						
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 @ 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						
Alk. Mud (Pm)		0.00						
Alk. Filtr. (Pf/Mf)		0.00/0.00						
Chlorides mg/l		35000						
Hard. Ca mg/l		0						
Low Gravity Solids ppb		0.00						
6 rpm		0						
KCl Content	ppb							
KCl Content	% wt							

MUD TREATMENTS

Mixed up additional 230 bbl of 8.7 ppg KCL Brine to kill well after testing.
7" casing displacement, approx 58 bbl lost.

RIG ACTIVITY

Run in 7" completion casing string. Run logs VDL/GR/CL to correlate packer setting/TCP depth. Run additional 7" casing. Run logs to correlate depth. Make up pup jt, hanger and landing jt. Space out. Rig up wireline unit, lubricator.
Pressure test lines, packer.

MATERIALS USED

Product	Used	Cost	Product	Used	Cost
KCL - Tech. - 25 KG. SACK	99	1388.97			

SOLIDS EQUIPMENT

Device	Make	Sz/Scrn	HR
Shkr #1	DFE-LM	3x110	
Shkr #2	DFE-LM	3x110	
dSlt #1	Harrisburg	12' * 4	
Cent #1	DFE	Hi-Vol	

MUD MANAGEMENT

MUD VOLUME bbl

Hole	Pits
355	325
Active Volume	
680	
Reserve	Total
400	1080

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

INHIBITED KCL BRINE

MUD CONSUMPTION

ADDITIONS	bbl
Oil	0
Brine Water	0
Drill Water	223
Sea Water	0
Whole Mud	0
Barite	0
Chemicals	7
LOSSES	bbl
Dumped	0
Lost	58
VOL GAIN/LOSS	172

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	10.9
ECD ppg	
Csg. Shoe	0.0
TD	0.0
Max. Diff. Press	0

DEVIATION INFO

MD	1720.0 m
TVD	1363.6 m
Angle	60.70
Direction	265.7
Horiz. Displ	721.3 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
Tun Aung	WAREHOUSE	Welshpool	TELEPHONE	(03) 5688 1445	$A 1388.97	$A 63311.68

NOTE: ALL COSTS ARE REPORTED IN AUSTRALIA'S DOLLAR

PE908222

This is an enclosure indicator page.
The enclosure PE908222 is enclosed within the container PE908215 at this location in this document.

The enclosure PE908222 has the following characteristics:

ITEM_BARCODE	PE908222
CONTAINER_BARCODE	PE908215
NAME	Iona-5 Mud Log
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	MUD_LOG
DESCRIPTION	Iona-5 Formation Evaluation (Mud) Log, Scale 1:200, Enclosure 1 of Iona-5 Well Completion Report
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-5
CONTRACTOR	Western Underground Gas Storage Pty Ltd
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	155
BOTTOM_DEPTH	1720
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE908223

This is an enclosure indicator page.
The enclosure PE908223 is enclosed within the container PE908215 at this location in this document.

The enclosure PE908223 has the following characteristics:

ITEM_BARCODE	PE908223
CONTAINER_BARCODE	PE908215
NAME	Iona-5 Composite Well Log
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	COMPOSITE_LOG
DESCRIPTION	Iona-5 Composite Well Log Enclosure 2 of Iona-5 Well Completion Report
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-5
CONTRACTOR	
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	650
BOTTOM_DEPTH	1725
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE908224

This is an enclosure indicator page.
The enclosure PE908224 is enclosed within the container PE908215 at this location in this document.

The enclosure PE908224 has the following characteristics:

ITEM_BARCODE	PE908224
CONTAINER_BARCODE	PE908215
NAME	Iona-5 Composite Well Log
BASIN	OTWAY
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	COMPOSITE_LOG
DESCRIPTION	Iona-5 Composite Well Log - Reservoir Section Enclosure 3 of Iona-5 Well Completion Report
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	
DATE_RECEIVED	
RECEIVED_FROM	Western Underground Gas Storage Pty Ltd
WELL_NAME	Iona-5
CONTRACTOR	
AUTHOR	
ORIGINATOR	Western Underground Gas Storage Pty Ltd
TOP_DEPTH	
BOTTOM_DEPTH	
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)