Annex E

Field Documentation

Oil / Water Interface Meter

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Instrument Geotech Interface Meter (30M)
Serial No. 3983

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: SB Sophie Boler

Calibration date: 24/10/2013

Next calibration due: 23/12/2013

Oil / Water Interface Meter

Instrument Geotech Interface Meter (30M)
Serial No. 3978

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: SB Sophie Boler

Calibration date: 25/10/2013

Next calibration due: 24/12/2013

PID Calibration Certificate

Instrument PhoCheck Tiger
Serial No. T-105429

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	**Low**	**High**	**TWA**	**STEL**
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:	Flowrate					

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		100ppm Isobutylene	NIST	SY21		100.4ppm

Calibrated by: SB. **Sophie Boler**

Calibration date: **4/11/2013**

Next calibration due: **4/12/2013**

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony - Liddell	**Project Staff :**	Josh Konrad
Project No :	224198	**Date :**	11/11/13

Photo-ionisation Detector

Make/Model No:	Pocket Tiger
Serial Number:	T - 105429

Calibration Gas

Calibration Gas:	Isobutylene - SPAN

PID Calibration

Zero Calibration

PID Reading:	0

Span Calibration

Desired PID Reading:	100
Actual PID Reading:	99.8

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	Josh Konrad

Signature:			Date:	11/11/13

PID Calibration Certificate

Instrument PhoCheck Tiger Select
Serial No. T-106085

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
Pump	Operation	✓	
	Filter	✓	
	Flow	✓	
	Valves, Diaphragm	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	PID	✓	10.0 ev
Alarms	Beeper	✓	Low: 50ppm; High: 100ppm; TWA: ; STEL:
	Settings	✓	
Software	Version	✓	
Data logger	Operation	✓	
Download	Operation	✓	
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		100ppm	NIST	SY21		100.0ppm

Calibrated by: AR **Anne Rutlidge**

Calibration date: 13/11/2013

Next calibration due: 13/12/2013

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony - Hold	**Project Staff :**	Josha Kondd
Project No :	0224198	**Date :**	13/11/13

Photo-ionisation Detector

Make/Model No:	Photocheck Tiger
Serial Number:	T-105429

Calibration Gas

Calibration Gas:	Iso butyl

PID Calibration

Zero Calibration

PID Reading:	0

Span Calibration

Desired PID Reading:	100
Actual PID Reading:	100.4

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	Joshua Kondd

Signature:			Date:	13/11/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony - Tibbld	**Project Staff :**	Josh K.
Project No :	0224198	**Date :**	14/11/13

Photo-ionisation Detector

Make/Model No:	Photocheck Tiger
Serial Number:	T, 105429

Calibration Gas

Calibration Gas:	SPAN - Isobutylene

PID Calibration

Zero Calibration

PID Reading:	0

Span Calibration

Desired PID Reading:	100
Actual PID Reading:	100.1

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	Joshua Kowal			
Signature:			Date:	14/11/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony-Hodder	**Project Staff :**	Jash k
Project No :	0244189	**Date :**	15/11/13

Photo-ionisation Detector

Make/Model No:	T105429
Serial Number:	

Calibration Gas

Calibration Gas:	SRAV - Isobutylene

PID Calibration

Zero Calibration

PID Reading:	0

Span Calibration

Desired PID Reading:	100
Actual PID Reading:	100.1

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	Tasha Kovac

Signature:			Date:	15/11/13

PID Calibration Certificate

Instrument Minirae 3000
Serial No. 592-001272

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm	10ppm	25ppm
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		100ppm Isobutylene	NATA	SY21		100.2ppm

Calibrated by: Jacob Arnott

Calibration date: 18/11/2013

Next calibration due: 18/12/2013

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	LIDDELL	**Project Staff :**	J. GIRVIN
Project No :	0224198	**Date :**	19/11/13 ✓ 100.2 ✓ 20/11/13 ✓ 100.1 ✓

Photo-ionisation Detector

Make/Model No:	Photocheck Tiger
Serial Number:	T-106085.

Calibration Gas

Calibration Gas:	Isobutylene 100 ppm

PID Calibration

Zero Calibration

PID Reading:	0.000 ✓ (ppb).

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.2 ✓ ok

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GIRVIN

Signature:			Date:	19/11/13.

M

vironmental Resources Management Australia Pty Ltd

D Calibration Certificate

Project Name :	Symphony-Liddell	**Project Staff :**	J. GIRVIN
Project No :	0224198	**Date :**	20/11/13 Wed.

Photo-ionisation Detector

Make/Model No:	ProCheck Tiger
Serial Number:	T-106085

Calibration Gas

Calibration Gas:	Isobutylene 100ppm

PID Calibration

Zero Calibration

PID Reading:	0.1 → 0.0 after re-cal

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.8 ✓ within 1%

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GIRVIN			
Signature:			Date:	20/11/13.

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony	**Project Staff :**	T.A
Project No :	0224198	**Date :**	17.11.13 ✓

18.11.13 ✓
19.11.13 ✓
20.11.13 → Calibrated
21.11.13 ✓

Photo-ionisation Detector

Make/Model No:	Mini RAE Lite
Serial Number:	

Calibration Gas

Calibration Gas:	ISO

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	99.1

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	T. ARMANI

Signature:			Date:	21.11.13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony	**Project Staff :**	T. Armani
Project No :	0224198	**Date :**	19.11.13 ⇒ 105 ppm 20.11.13 ⇒ cal. 21.11.13 ⇒ 110.3 ppm

Photo-ionisation Detector

Make/Model No:	MiniRAE 3000
Serial Number:	592-001359

Calibration Gas

Calibration Gas:	Iso

PID Calibration

Zero Calibration

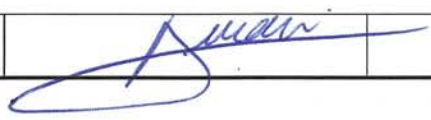
PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.1

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:		T. ARMANI		
Signature:			Date:	22.11.13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony - Liddell.	**Project Staff :**	J. GRUN
Project No :	0224198	**Date :**	21/11/13 Thurs.

Photo-ionisation Detector

Make/Model No:	ProCheck Tiger
Serial Number:	T-106085

Calibration Gas

Calibration Gas:	Isobutylene 100ppm.

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.7

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GRUIN

Signature:			Date:	21/11/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Liddell.	**Project Staff :**	J. GIRVIN
Project No :	0224198	**Date :**	26/11/13 Tues.

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	592-001272

Calibration Gas

Calibration Gas:	100ppm Isobutylene.

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100 ppm
Actual PID Reading:	100.2

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GIRVIN

Signature:			Date:	26/11/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony - Liddell	**Project Staff :**	JOSH G.
Project No :	0224198	**Date :**	27/11/13 Weds.

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	592-001272

Calibration Gas

Calibration Gas:	100ppm Isob.

PID Calibration

Zero Calibration

PID Reading:	0.2 → 0.0 after re-cal.

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.2

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By: J. GRVIN

Signature:			Date:	27/11/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Liddell Symphony	**Project Staff :**	Jayla Lowe
Project No :	0224189	**Date :**	27/11/13

Photo-ionisation Detector

Make/Model No:	Photocheck 11S2
Serial Number:	T-105429

Calibration Gas

Calibration Gas:	C-SPHN

PID Calibration

Zero Calibration

PID Reading:	0

Span Calibration

Desired PID Reading:	100
Actual PID Reading:	102.6

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	O'Connor

Signature:			Date:	27/11/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Liddell	**Project Staff :**	JOHN G
Project No :	0224198	**Date :**	28/11/13 Thurs.

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	592-001272

Calibration Gas

Calibration Gas:	100ppm Isobutylene.

PID Calibration

Zero Calibration

PID Reading:	0.2 → 0.0 after re-cal.

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.3

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By: J. GIRVIN

Signature:			Date:	28/11/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony Holder	**Project Staff :**	Josh Kowal
Project No :	0224187	**Date :**	28/11/13

Photo-ionisation Detector

Make/Model No:	Rhocheck Tiger
Serial Number:	T-105429

Calibration Gas

Calibration Gas:	C-SPAN

PID Calibration

Zero Calibration

PID Reading:	0

Span Calibration

Desired PID Reading:	100
Actual PID Reading:	104

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:		Josh Kowal		
Signature:			Date:	28/11/13

Oil / Water Interface Meter

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument Geotech Interface Meter (30M)
Serial No. 3913

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	9.5v
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: AR **Anne Rutlidge**

Calibration date: **29/11/2013**

Next calibration due: **28/01/2014**

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Liddell	**Project Staff :**	J. GIRVIN
Project No :	0224198	**Date :**	29/11/13 (Fri.)

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	592-001272

Calibration Gas

Calibration Gas:	100 ppm Isobutylene.

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.1

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GIRVIN

Signature:			Date:	29/11/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Liddell	**Project Staff :**	Josh G.
Project No :	0224198	**Date :**	30/11/13 Sat.

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	592-001272

Calibration Gas

Calibration Gas:	Isobutylene 100.

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.1

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GIRVIN

Signature:			Date:	30/11/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony - Liddell	**Project Staff :**	J. GRVIN
Project No :	0224198	**Date :**	02/12/13

Mon.

Photo-ionisation Detector

Make/Model No:	MiniRae 3000.
Serial Number:	592-001272

Calibration Gas

Calibration Gas:	Isobutylene 100

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	99.9

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GIRVIN (+ HANNAH C.).

Signature:			Date:	02/12/13.

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony - Antlene	**Project Staff :**	J. GRUIN
Project No :	0224198	**Date :**	03/12/13 Tues.

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	592 - 001272

Calibration Gas

Calibration Gas:	Isobutylene 100

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	99.8

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GRUIN

Signature:			Date:	03/12/13 09:30

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony (Liddell)	**Project Staff :**	Sean Penza
Project No :	0224198	**Date :**	3/12/13

Photo-ionisation Detector

Make/Model No:	PhoCheck Tiger
Serial Number:	T-105517

Calibration Gas

Calibration Gas:	Isobutylene

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.1

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:		Sean Penza			
Signature:				Date:	3/12/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony - Antheve	**Project Staff :**	J. GIRVIN
Project No :	0224193	**Date :**	04/12/13 Weds.

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	592 - 001272

Calibration Gas

Calibration Gas:	Isobutylene 100

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	99.9 ✓ ok

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GIRVIN

Signature:			Date:	04/12/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony (11/06/11)	**Project Staff :**	Sean Penzo
Project No :	0224188	**Date :**	4/12/13

Photo-ionisation Detector

Make/Model No:	PhoChock Tiger
Serial Number:	T-105517

Calibration Gas

Calibration Gas:	Isobutylene

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.0

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	Sean Penzo

Signature:			Date:	9/12/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Antlers Coal Unloader	**Project Staff :**	J. GRUNN
Project No :	0224193	**Date :**	05/12/13 Thurs.

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	592-001272

Calibration Gas

Calibration Gas:	Isobutylene 100

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	99.9

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GRUNN

Signature:			Date:	05/12/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony (Liddell)	**Project Staff :**	Sean Penzo
Project No :	0274198	**Date :**	5/12/13

Photo-ionisation Detector

Make/Model No:	PhoCheck Tiger
Serial Number:	T-105517

Calibration Gas

Calibration Gas:	Isobutylene

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.2

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	Sean Penzo			
Signature:			Date:	5/12/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony	**Project Staff :**	T.A
Project No :	0224198	**Date :**	2.12.13 ✓ 3.12.13 ✓ 4.12.13 ✓ 5.12.13 ✓ 6.12.13

Photo-ionisation Detector

Make/Model No:	PhoCheck Tiger
Serial Number:	T-105429

Calibration Gas

Calibration Gas:	ISO

PID Calibration

Zero Calibration

PID Reading:	

Span Calibration

Desired PID Reading:	
Actual PID Reading:	

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	T. ARMANI

Signature:			Date:	6.12.13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony (Liddell)	**Project Staff :**	Sean Penza
Project No :	0224198	**Date :**	6/12/13

Photo-ionisation Detector

Make/Model No:	PhoCheck Tiger
Serial Number:	T-105517

Calibration Gas

Calibration Gas:	Isobutylene

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.1

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	Sean Penza			
Signature:			Date:	6/12/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony - Ravensworth / coal unloader, + Liddell	**Project Staff :**	J. GRVIN
Project No :	0224193 / 0224198.	**Date :**	09/12/13 Mon.

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	SN: 592-001272

Calibration Gas

Calibration Gas:	Isobutylene 100.

PID Calibration

Zero Calibration

PID Reading:	0.2 → 0.0 after re-cal.

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	99.8

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GRVIN

Signature:			Date:	09/12/13.

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony - Liddell	**Project Staff :**	J. GIRVIN
Project No :	0224198	**Date :**	10/12/13 Tues.

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	592-001272

Calibration Gas

Calibration Gas:	Isobutylene 100

PID Calibration

Zero Calibration

PID Reading:	0.0

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.2

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GIRVIN

Signature:			Date:	10/12/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Liddell	**Project Staff :**	J. GIRVIN
Project No :	0224198	**Date :**	12/12/13

Thurs.

(NB - no samples taken 11/12/13 - no cal sheet).

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	592-001272

Calibration Gas

Calibration Gas:	Isobutylene 100.

PID Calibration

Zero Calibration

PID Reading:	0.2 → 0.0 after recal.

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	100.2

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GIRVIN

Signature:			Date:	12/12/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Liddell	**Project Staff :**	J. GIRVIN
Project No :	0224198	**Date :**	13/12/13

FM.

Photo-ionisation Detector

Make/Model No:	MiniRae 3000.
Serial Number:	592-001272

Calibration Gas

Calibration Gas:	Isobutylene 100.

PID Calibration

Zero Calibration

PID Reading:	0.1 → 0.0 after recal.

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	99.7

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GIRVIN

Signature:			Date:	13/12/13

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Symphony - Liddell	**Project Staff :**	J. GIRVIN
Project No :	0224198	**Date :**	16/12/13. (Mon.)

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	592-001272

Calibration Gas

Calibration Gas:	Isobutylene 100

PID Calibration

Zero Calibration

PID Reading:	0.1 → 0.0 after re-cal.

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	99.4

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GIRVIN

Signature:			Date:	16/12/13.

ERM

Environmental Resources Management Australia Pty Ltd

PID Calibration Certificate

Project Name :	Liddell	**Project Staff :**	J. GIRVIN
Project No :	0224198	**Date :**	17/12/13 (Tues.)

Photo-ionisation Detector

Make/Model No:	MiniRae 3000
Serial Number:	592-001272.

Calibration Gas

Calibration Gas:	Isobutylene 100.

PID Calibration

Zero Calibration

PID Reading:	0.1 → 0.0 after recal.

Span Calibration

Desired PID Reading:	100.0
Actual PID Reading:	99.6

Certification

The above detector has been calibrated in accordance with the manufacturers specifications.

Checked By:	J. GIRVIN

Signature:			Date:	17/12/13.

Groundwater - Well Sampling Data Form

ERM

Well Development

Job Information

Date: 25/4/13	Time: arrive 15:30 depart
Project Name: Project Symphony	Project Number: 0224198
Site Location: Liddell	Sampler: N.H
Well ID: LA_MW01	Weather: overcast, light rain

Equipment

Water quality equipment description: NA Interface probe number: SYD 3954

Purging equipment (please cirlce): Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 10.200 m (-) Water level 5.900 m (=) Water Column 4.7 m

Water Column 4.7 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 9.212 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y N

Water Quality Parameters

Beginning purge time: 15:45 Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
12	15:50							Brown, turbid. Purged dry after 12L. Allowed to recharge.
17	15:55							Brown, turbid. Purged dry after another 5L. Allowed to recharge
20	14:00							Brown, becoming clearer. Purged dry after another 3L. Allowed to recharge
23	14:05							Colourless slightly cloudy to clear. Purged dry after another 3L. Slowly recharging

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

Total Well Volume — Actual amount of water prior to sampling Sample time — Containers used —

Flow rate — mL/minute Did field parameters stabilise? Y N NA Was the well dry purged? Y N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID
Rinsate blank collected?	Y	N	Rinsate blank ID

Groundwater - Well Sampling Data Form

ERM

Well Development	Job Information	
Date: 26/11/13	Time: arrive 14:30	depart
Project Name: Project Symphony	Project Number: 0224198	
Site Location: Liddell	Sampler: N.H	
Well ID: LA-MW02	Weather: Fine	

Equipment

Water quality equipment description: NA Interface probe number: SYD 3954

Purging equipment: (please circle) Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 8.275 m (-) Water level 6.455 m (=) Water Column 1.82 m

Water Column 1.82 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 3.57 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y / N

Water Quality Parameters

Beginning purge time: 14:40 Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
5	14:43							Brown, turbid. No odour. Purged dry after 5L. Allowed to recharge.
7	14:50							Brown, turbid. No odour. Purged dry after another 2L. Allowed to recharge.
8	14:55							brown. turbid. No odour. Purged dry after another 1L. slow recharging

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

Total Well Volume Actual amount of water prior to sampling Sample time — Containers used —

Flow rate mL/minute Did field parameters stabilise? Y / N / NA Was the well dry purged? Y / N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID
Rinsate blank collected?	Y	N	Rinsate blank ID

Groundwater - Well Sampling Data Form

ERM

Well Development	Job Information		
Date: 26/11/13	Time: arrive 15:20	depart 16:10	
Project Name: [redacted] Project Symphony	Project Number: 0224198		
Site Location: Liddell	Sampler: N.H		
Well ID: LA_MW03	Weather: Fine		

Equipment

Water quality equipment description: NA — Interface probe number: SYD 3954

Purging equipment (please circle): Bailer type: Plastic / Teflon — Pump type: Peristaltic / Submersible / Micro-purge / Amazon / Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 10.185 m (-) Water level 5.960 m (=) Water Column 4.225 m

Water Column 4.225 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 8.28 L

Depth to product: — m — Product Thickness: — m — Verified with Bailer: Y / N

Water Quality Parameters

Beginning purge time: 15:45 — Ending purge time: — Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
15	15:50							Brown, turbid, becoming clear after 10L. Purged dry after 15L. Allowed to recharge
20	15:55							brown to cloudy. No odour. Purged dry after another 5L.
25	16:00							Cloudy. Purged dry after another 5L.
28	16:05							Cloudy. Purged dry after another 3L. recharging slowly.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

28 — **Total Well Volume** Actual amount of water prior to sampling — Sample time — — Containers used —

— — **Flow rate** mL/minute — Did field parameters stabilise? Y / N / NA — Was the well dry purged? (Y) / N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N		
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N		
Was documentation of equipment conducted?	Y	N	NA	
Were air bubbles present in vials at time of collection?	Y	N	NA	
Was sample for metals field filtered prior to preservations?	Y	N	NA	
Duplicate sample collected?	Y	N		Duplicate sample ID
Rinsate blank collected?	Y	N		Rinsate blank ID

Groundwater - Well Sampling Data Form

ERM

Job Information	
Date: 17/12/2013	Time: arrive 0730 depart 0810
Project Name: Symphony	Project Number:
Site Location: Liddell	Sampler: Sam Campbell
Well ID: LB_MW01	Weather: Fine

Equipment

Water quality equipment description: — Interface probe number: 122009747-1

Purging equipment (please circle): Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Total Well Depth 11.805 m (-) Water level 8.631 m (=) Water Column ~3.2 m

Water Column ~3.2 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume ~6.4 L

Depth to product: _____ m Product Thickness: _____ m Verified with Bailer: Y / N

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Water Quality Parameters

Beginning purge time: 0736 Ending purge time: 0800 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
								Grey, turbid, no odour
								well dry at ~12L (0748)
								wait 10 minutes
								Begin recharge (0750)
								light grey - water becoming clearer ~20L
								Total volume purged = ~26L
								Post-purge gauging:
								water level = 9.160
								well depth = 11.816

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

— **Total Well Volume** Actual amount of water prior to sampling Sample time _____ Containers used _____

— **Flow rate** mL/minute Did field parameters stabilise? Y / N / NA Was the well dry purged? Y / N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N		
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N		
Was documentation of equipment conducted?	Y	N	NA	
Were air bubbles present in vials at time of collection?	Y	N	NA	
Was sample for metals field filtered prior to preservations?	Y	N	NA	
Duplicate sample collected?	Y	N		Duplicate sample ID _____
Rinsate blank collected?	Y	N		Rinsate blank ID _____

Groundwater - Well Sampling Data Form

ERM

WELL DEVELOPMENT	Job Information		
Date: 19/12/13		Time: arrive 2:30pm	depart 3:40pm
Project Name: SYMPHONY		Project Number: 0224198	
Site Location: LIDDELL.		Sampler: TM	
Well ID: LB-MW03		Weather: HOT & CLEAR.	

Equipment

Water quality equipment description: YOFIMV 45.443. Interface probe number: Geotech. IP 30m 4261.

Purging equipment (please circle): Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Total Well Depth 2.577 m (-) Water level 1.669 m (=) Water Column 0.908 m

Water Column _____ m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume _____ L

Depth to product: ~ m Product Thickness: ~ m Verified with Bailer: Y (N)

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Water Quality Parameters

Beginning purge time: Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
4	2:50pm							grey turbidity no odour
3	2:55pm							rapid recharge.
5	3:02pm							
								well had recharged
								back to SWL prior to
								sampling.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

Total Well Volume Actual amount of water prior to sampling

Flow rate mL/minute

Sample time ~ Containers used _____

Did field parameters stabilise? ~~Y~~ ~~N~~ NA Was the well dry purged? Y (N)

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	(Y)	~~N~~	
Was pre-cleaning sampling equipment properly protected from contamination?	(Y)	~~N~~	
Was documentation of equipment conducted?	(Y)	~~N~~	~~NA~~
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	~~Y~~	(N)	
Rinsate blank collected?	~~Y~~	(N)	

Duplicate sample ID _____

Rinsate blank ID _____

Groundwater - Well Sampling Data Form

ERM

Job Information			
Date:	17/12/2013	Time: arrive	0850 depart 0930
Project Name:	Symphony	Project Number:	
Site Location:	Liddell	Sampler:	Sam Campbell
Well ID:	LB_MW05	Weather:	Fine + Sunny

Equipment

Water quality equipment description: —

Interface probe number: 122009747-1

Purging equipment (please circle):
Bailer type: **Plastic** **Teflon**
Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 4.984 m (-) Water level 1.117 m (=) Water Column ~3.8 m

Water Column ~3.8 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume ~7.6 L

Depth to product: _____ m Product Thickness: _____ m Verified with Bailer: Y / N

Water Quality Parameters

Beginning purge time: 0855 Ending purge time: 0915 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
								silty bottom, no odour
								water: brown/tan, no odour, turbid
								well dry: ~30L
								wait 10 minutes (0900)
								Begin recharge 0910.
								Total volume purged = ~55L
								Post-purge gauging:
								*PID faulty
								total well depth = 5.452

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

—
Total Well Volume
Actual amount of water prior to sampling

—
Flow rate
mL/minute

Sample time _____ Containers used _____

Did field parameters stabilise? Y / N / NA

Was the well dry purged? Y / N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N		
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N		
Was documentation of equipment conducted?	Y	N	NA	
Were air bubbles present in vials at time of collection?	Y	N	NA	
Was sample for metals field filtered prior to preservations?	Y	N	NA	
Duplicate sample collected?	Y	N		Duplicate sample ID _____
Rinsate blank collected?	Y	N		Rinsate blank ID _____

Groundwater - Well Sampling Data Form

ERM

Job Information

Date:	~~17-12-13~~ 17-12-13	Time: arrive 1050	depart 1120
Project Name:	Symphony	Project Number:	
Site Location:	Liddell	Sampler:	Sam Campbell
Well ID:	LB-MW06	Weather:	Fine / slightly overcast

Equipment

Water quality equipment description: —

Interface probe number: Solinst 55191

Purging equipment: (please cirlce)

Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 4.402 m (-) Water level 3.761 m (=) Water Column ~0.7 m

Water Column ~0.7 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume ~1.4 L

Depth to product: _____ m Product Thickness: _____ m Verified with Bailer: Y (N)

Water Quality Parameters

Beginning purge time: Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
								no odour, brown, turbid
								well dry at ~0.5L
								wait ten minutes (1058)
								Begin recharge (1108)
								Total volume = ~2.5L - well dry
								post-purge gauging:
								water level = 4.385
								well depth = 4.402

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

—

Total Well Volume
Actual amount of water prior to sampling

—

Flow rate
mL/minute

Sample time _____ Containers used _____

Did field parameters stabilise? Y N NA

Was the well dry purged? Y (N)

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N		
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N		
Was documentation of equipment conducted?	Y	N	NA	
Were air bubbles present in vials at time of collection?	Y	N	NA	
Was sample for metals field filtered prior to preservations?	Y	N	NA	
Duplicate sample collected?	Y	N		Duplicate sample ID _____
Rinsate blank collected?	Y	N		Rinsate blank ID _____

Groundwater - Well Sampling Data Form

ERM

Job Information

Date:	17-12-13	Time: arrive 1128	depart 1205
Project Name:	Symphony	Project Number:	
Site Location:	Liddell	Sampler:	Sam Campbell
Well ID:	LB_MW08	Weather:	Fine + Sunny

Equipment

Water quality equipment description: –

Interface probe number: Solinst 55191

Purging equipment (please circle)

Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 10.665 m (-) Water level 5.021 m (=) Water Column ~5.6 m

Water Column ~5.6 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume ~11.2 L

Depth to product: _____ m Product Thickness: _____ m Verified with Bailer: Y (N)

Water Quality Parameters

Beginning purge time: 1135 Ending purge time: 1155 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
								no odour, dark grey, turbid
								Total volume purged = 80L
								Post-purge gauging:
								water level = 5.955
								well depth = 10.695

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

~ **Total Well Volume** Actual amount of water prior to sampling

Sample time ~ Containers used ~

~ **Flow rate** mL/minute

Did field parameters stabilise? ~~Y~~ ~~N~~ ~~NA~~ Was the well dry purged? ~~Y~~ ~~N~~

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N		
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N		
Was documentation of equipment conducted?	~~Y~~	N	NA	
Were air bubbles present in vials at time of collection?	Y	N	NA	
Was sample for metals field filtered prior to preservations?	Y	N	NA	
Duplicate sample collected?	Y	N		Duplicate sample ID _____
Rinsate blank collected?	Y	N		Rinsate blank ID _____

Groundwater - Well Sampling Data Form

ERM

Job Information

Date: 17-12-13	Time: arrive 1230 depart 1320
Project Name: Symphony	Project Number: 0224198
Site Location: Liddell	Sampler: Sam Campbell
Well ID: LB_MW11	Weather: Fine + Sunny

Equipment

Water quality equipment description: —

Interface probe number: Solinst 55191

Purging equipment (please circle)

Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 8.493 m (-) Water level 7.022 m (=) Water Column ~1.5 m

Water Column ~1.5 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume ~3 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y (N)

Water Quality Parameters

Beginning purge time: 1245 Ending purge time: 1714 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
								light brown / tan, turbid, no odour
								well dry ~8L (1250)
								wait 10 minutes
								Begin recharge (1300)
								well dry ~9L, wait 10 minutes.
								Begin recharge (1311), well dry.
								Total volume = ~9L
								post-purge gauging:
								water level = 8.003
								well depth = 8.495

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

— **Total Well Volume** Actual amount of water prior to sampling

— **Flow rate** mL/minute

Sample time — Containers used —

Did field parameters stabilise? Y N NA

Was the well dry purged? Y (N)

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID —
Rinsate blank collected?	Y	N	Rinsate blank ID —

Groundwater - Well Sampling Data Form

ERM

Job Information

Date: 16/12/2013	Time: arrive 1430 depart 1535
Project Name: Symphony	Project Number: 0224198
Site Location: Liddell	Sampler: Sam Campbell
Well ID: LB_MW13	Weather: Fine + Sunny

Equipment

Water quality equipment description: -

Interface probe number: 122009747-1

Purging equipment: (please circle)

Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth (-) Water level (=) Water Column

7.787 m (-) 6.390 m (=) ~1.4 m

Water Column (x) Conversion Factor (=) Litres per 1 Well Volume

~1.4 m (x) 1.96 (=) ~2.8 L

Depth to product: _____ m Product Thickness: _____ m Verified with Bailer: Y / N

Water Quality Parameters

Beginning purge time: 1445 Ending purge time: 1525

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
								no odour
								Water: very turbid, brown, no odour
								Dry ~8L - 1455
								Time waited = 10 minutes -
								Begin recharge: 1505
								Slightly turbid, light brown, no odour
								Time waited = 10 minutes, Dry ~11L - 1509
								Begin recharge: 1514. Total purged = ~15L
								After purging gauging: water level: 6.457
								well depth: 7.781

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

—

Total Well Volume
Actual amount of water prior to sampling

—

Flow rate
mL/minute

Sample time — Containers used —

Did field parameters stabilise? Y / N / ~~NA~~ Was the well dry purged? Y / N

Field QC Checks

Was pre-cleaning sampling equipment used for these samples?	Y	N		
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N		
Was documentation of equipment conducted?	Y	N	NA	
Were air bubbles present in vials at time of collection?	Y	N	NA	
...ple for metals field filtered prior to preservations?	Y	N	NA	
...ample collected?	Y	N		Duplicate sample ID _____
...collected?	Y	N		Rinsate blank ID _____

...form.cdr 11/04

Groundwater - Well Sampling Data Form

ERM

Job Information			
Date:	16/12/2013	Time: arrive	1350 depart 1426
Project Name:	Symphony	Project Number:	0224198
Site Location:	Liddell	Sampler:	Sam Campbell
Well ID:	LB_MW14	Weather:	Fine + Sunny

Equipment

Water quality equipment description: —

Interface probe number: 122009 747 - 1

Purging equipment: (please cirlce)

Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth (-) Water level (=) Water Column
5.785 m (-) 3.512 m (=) ~2.2 m

Water Column (x) Conversion Factor (=) Litres per 1 Well Volume
2.2 m (x) ~2 (=) ~4.4 L

Depth to product: _____ m Product Thickness: _____ m Verified with Bailer: Y / N

Water Quality Parameters

Beginning purge time: 1354 Ending purge time: 1412

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
								silty bottom, no odour, water: turbid, brown
								Dry 25 L - 1358 no odour
								Time waited = 10 minutes.
								Begin recharge: 1408
								turbid, brown, no odour
								Total amount purged = ~40 L
				After purging				Gauging: well depth: 6.235 m
								water level: well dry.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

— **Total Well Volume** Actual amount of water prior to sampling Sample time — Containers used —

— **Flow rate** mL/minute Did field parameters stabilise? Y / N / ~~NA~~ Was the well dry purged? Y / N

Field QC Checks

Was pre-cleaning sampling equipment used for these samples?	Y	N		
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N		
Was documentation of equipment conducted?	~~Y~~	N	NA	
Were air bubbles present in vials at time of collection?	Y	N	NA	
Was sample for metals field filtered prior to preservations?	Y	N	NA	
Duplicate sample collected?	Y	N		Duplicate sample ID _____
Rinsate blank collected?	Y	N		Rinsate blank ID _____

Groundwater - Well Sampling Data Form

ERM

Job Information			
Well Development			
Date: 27/11/13		Time: arrive 10:35	depart
Project Name: Project Symphony		Project Number: 0224198	
Site Location: Liddell		Sampler: N.H	
Well ID: LD_MW01		Weather: Fine	

Equipment

Water quality equipment description: N/A Interface probe number: SYD3954

Purging equipment: (please cirlce) Bailer type: **Plastic** / **Teflon**

Pump type: **Peristaltic** / **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 8.495 m (-) Water level 7.530 m (=) Water Column 0.965 m

Water Column 0.965 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 1.89 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y / N

Water Quality Parameters

Beginning purge time: 10:48 Ending purge time: 11:05 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
3	10:50							Cloudy. No odour. Purged dry after 3L. Allowed to recharge
4	10:55							Cloudy. No odour. Purged dry after another 1L. Allowed to recharge.
5	11:05							Cloudy No odour. ~1L more. Dry.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

5 **Total Well Volume** Actual amount of water prior to sampling Sample time — Containers used —

— **Flow rate** mL/minute Did field parameters stabilise? Y / N / NA Was the well dry purged? Y / N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID
Rinsate blank collected?	Y	N	Rinsate blank ID

Groundwater - Well Sampling Data Form

ERM

Well Development	Job Information	
Date: 25/11/13	Time: arrive 08:25	depart 09:40
Project Name: Project Symphony	Project Number: 0224498	
Site Location: Lidbell	Sampler: N.H	
Well ID: LD_MW02	Weather: Fine	

Equipment

Water quality equipment description: NA Interface probe number: SYD 3954

Purging equipment (please circle): Bailer type: Plastic Teflon

Pump type: Peristaltic **Submersible** Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 7.440 m (-) Water level 3.425 m (=) Water Column 4.015 m

Water Column 4.015 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 7.869 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y / N

Water Quality Parameters

Beginning purge time: 09:55 Ending purge time: 09:20 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
10	08:58							brown, turbid, purged dry. Allowed to recharge.
14	09:05							Purged another 4L brown turbid, purged dry. Allowed to recharge.
16	09:10							Purged another 2L brown turbid, purged dry. Allowed to recharge.
17	09:15							Purged another 1L brown. turbid, purged dry. not actively recharging.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

Total Well Volume — Actual amount of water prior to sampling Sample time — Containers used —

Flow rate — mL/minute Did field parameters stabilise? Y / N / NA Was the well dry purged? Y / N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID _____
Rinsate blank collected?	Y	N	Rinsate blank ID _____

Groundwater - Well Sampling Data Form

ERM

Job Information

Date: 27/11/13	Time: arrive 09:20 depart 10:25
Project Name: Project Symphony	Project Number: 0224498
Site Location: Liddell	Sampler: N.H
Well ID: LD_MW04	Weather: Fine

Equipment

Water quality equipment description: NA

Interface probe number: SYD 3954

Purging equipment (please cirlce)

Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 9.495 m (-) Water level 2.800 m (=) Water Column 6.695 m

Water Column 6.695 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 13.122 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y N

Water Quality Parameters

Beginning purge time: 09:33 Ending purge time: 10:15 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
24	09:40							brown, v. turbid. Purged dry after 24L. Allowed to recharge. No odour.
34	09:50							brown, v. turbid, no odour. Purged dry after another 10L. Allowed to recharge.
39	10:05							brown, v. turbid. No odour. Purged dry after another 5L. Allowed to Recharge.
44	10:15							brown, v. turbid. No odour. Purged dry after another 5L. Slow to recharge

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

44 **Total Well Volume** Actual amount of water prior to sampling

— **Flow rate** mL/minute

Sample time — Containers used —

Did field parameters stabilise? Y N NA Was the well dry purged? Y N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID —
Rinsate blank collected?	Y	N	Rinsate blank ID —

Groundwater - Well Sampling Data Form

ERM

Well Development

Job Information

Date: 27/11/13	Time: arrive 08:00 depart 09:10
Project Name: Project Symphony	Project Number: 0224198
Site Location: Adam Liddell	Sampler: N.H
Well ID: LD_MW05	Weather: Fine

Equipment

Water quality equipment description: N/A Interface probe number: SVD 3954

Purging equipment: (please cirlce)
Bailer type: **Plastic** **Teflon**
Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 10.570 m (-) Water level 3.485 m (=) Water Column 7.085 m

Water Column 7.085 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 13.87 L

Depth to product: - m Product Thickness: - m Verified with Bailer: Y / N

Water Quality Parameters

Beginning purge time: 08:25 Ending purge time: 08:55 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
20	08:30							Brown-black, very turbid. No odour. Purged dry after 20L. Allowed to recharge.
40	08:40							Cloudy & becoming clear after 30L. No odour Purged dry after another 20L. Allowed to charge
60	08:55							Clear. Purged dry after another 20L. No odour.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

60 **Total Well Volume** Actual amount of water prior to sampling Sample time - Containers used -

- **Flow rate** mL/minute Did field parameters stabilise? Y / N / NA Was the well dry purged? Y / N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID _____
Rinsate blank collected?	Y	N	Rinsate blank ID _____

Groundwater - Well Sampling Data Form

ERM

Well Development	Job Information	
Date: 22/11/13	Time: arrive 09:40	depart 10:10
Project Name: Project Symphony	Project Number: 0224198	
Site Location: ~~Hermitage~~ Liddell	Sampler: N.H	
Well ID: CE_MW02	Weather: overcast, light rain	

Equipment

Water quality equipment description: NA				Interface probe number: SYD 3954		
Purging equipment: (please circle)	Bailer type:	Plastic	Teflon			
	Pump type:	Peristaltic	Submersible	Micro-purge	Amazon	Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 6.825 m (-) Water level 3.495 m (=) Water Column 3.33 m

Water Column 3.33 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 6527 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y / N

Water Quality Parameters

Beginning purge time: 09:40 Ending purge time: 09:55 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
12	09:45							brown, turbid, purged dry after 12L. Allowed to recharge
14	09:55							purged another 2L - Dry. Did not recharge

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

14 **Total Well Volume** Actual amount of water prior to sampling — Sample time — Containers used —

— **Flow rate** mL/minute Did field parameters stabilise? Y / N / NA Was the well dry purged? Y / N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N		
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N		
Was documentation of equipment conducted?	Y	N	NA	
Were air bubbles present in vials at time of collection?	Y	N	NA	
Was sample for metals field filtered prior to preservations?	Y	N	NA	
Duplicate sample collected?	Y	N		Duplicate sample ID
Rinsate blank collected?	Y	N		Rinsate blank ID

Groundwater - Well Sampling Data Form

ERM

Job Information

Date: 22/11/13	Time: arrive 10:30 depart 11:10
Project Name: Project Symphony	Project Number: 0224198
Site Location: Liddell	Sampler: N.H
Well ID: LE_MW02	Weather: Overcast / light rain

Equipment

Water quality equipment description: NA

Interface probe number: SYD 3954

Purging equipment: (please circle)

Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 8.140 m (-) Water level 4.345 m (=) Water Column 3.795 m

Water Column 3.795 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 7.438 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y N

Water Quality Parameters

Beginning purge time: 10:45 Ending purge time: 11:05 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
10	10:50							Brown, turbid, purged dry after 10L. Allowed to recharge
16	11:00							Purged another 6L. Dry. Allowed to recharge.
20	11:05							Purged another 4L. Dry. Allowed to recharge.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

20 **Total Well Volume** Actual amount of water prior to sampling

— **Flow rate** mL/minute

Sample time — Containers used —

Did field parameters stabilise? Y N NA Was the well dry purged? Y N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID —
Rinsate blank collected?	Y	N	Rinsate blank ID —

Groundwater - Well Sampling Data Form

ERM

Job Information	
Date: 22/11/13	Time: arrive 12:15 depart
Project Name: Project Symphony	Project Number: 0224198
Site Location: Liddell	Sampler: N.H
Well ID: LE MW03	Weather: ~~Fine~~ Overcast

Equipment						
Water quality equipment description: NA				Interface probe number: S4D3954		
Purging equipment: (please circle)	Bailer type:	Plastic	Teflon			
	Pump type:	Peristaltic	(Submersible)	Micro-purge	Amazon	Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 5.425 m (-) Water level 2.075 m (=) Water Column 3.35 m

Water Column 3.35 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 6.566 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y / N

Water Quality Parameters

Beginning purge time: 12:30 Ending purge time: 12:50 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
12	12:35							brown, turbid, no odour. Purged dry after 12L. Allowed to recharge.
18	12:40							Purged another 6L. brown, turbid, becoming clear after 15L.
24	12:50							Clear, slight H.C. odour. Purged another 6L. Purged dry.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

—
Total Well Volume
Actual amount of water prior to sampling

—
Flow rate
mL/minute

Sample time — Containers used —

Did field parameters stabilise? Y / N / (NA) Was the well dry purged? (Y) / N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N		
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N		
Was documentation of equipment conducted?	Y	N	NA	
Were air bubbles present in vials at time of collection?	Y	N	NA	
Was sample for metals field filtered prior to preservations?	Y	N	NA	
Duplicate sample collected?	Y	N		Duplicate sample ID _____
Rinsate blank collected?	Y	N		Rinsate blank ID _____

Groundwater - Well Sampling Data Form

ERM

WELL DEVELOPMENT.

Job Information

Date: 3/12/13	Time: arrive 3pm. depart 4:40.
Project Name: SYMRHOM	Project Number: 0224198.
Site Location: LIDDELL - LE	Sampler: TM
Well ID: LE - MW04	Weather: HOT & CLEAR.

Equipment

Water quality equipment description: Interface probe number:

Purging equipment (please cirlce): Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 6.038 m (-) Water level 2.519 m (=) Water Column 3.519 m

Water Column 3.519 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 6.90 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y (N)

Water Quality Parameters

Beginning purge time: Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
12L.	3:55pm							brown turbidity to start clearing with depth, odour
								Pump on bottom of well — as insignificant volume of sediment
								identified when dipped
3L	4:05pm							brown turbidity with odour allowed to recharge.
2L.	4:15pm							brown turbidity, clearing with pumping — odour present.
1.5	4:25pm							- acquired in 3 x 500ml volumes over 10 minutes - well slow to
								recharge - considered developed

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

Total Well Volume Actual amount of water prior to sampling

Flow rate mL/minute

Sample time — Containers used —

Did field parameters stabilise? Y N ~~NA~~ Was the well dry purged? Y N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID —
Rinsate blank collected?	Y	N	Rinsate blank ID —

Groundwater - Well Sampling Data Form

ERM

Job Information			
Date:	22/4/13	Time: arrive	14:20 depart
Project Name:	Project Symphony	Project Number:	0224198
Site Location:	Liddell	Sampler:	N.H
Well ID:	LE-MW04	Weather:	overcast

Equipment

Water quality equipment description: NA Interface probe number: SYD 3954

Purging equipment: (please circle)
Bailer type: Plastic Teflon
Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 6.450 m (-) Water level 2.505 m (=) Water Column _____ m

Water Column _____ m (x) Conversion Factor _____ (=) Litres per 1 Well Volume _____ L

Depth to product: _____ m Product Thickness: _____ m Verified with Bailer: Y / N

Water Quality Parameters

Beginning purge time: 14:25 Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
~~16~~ 16	14:30							brown, turbid, H. Odour. Purged dry after 16 L. Allowed to recharge
~~4~~ 20	14:35							Beginning clearer. Purged dry after 4L. Allowed to recharge.
24	14:40							

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

24 **Total Well Volume** Actual amount of water prior to sampling

— **Flow rate** mL/minute

Sample time — Containers used —

Did field parameters stabilise? Y / N / NA Was the well dry purged? Y / N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID _____
Rinsate blank collected?	Y	N	Rinsate blank ID _____

Groundwater - Well Sampling Data Form

ERM

WELL DEVELOPMENT.

Job Information	
Date: 3/12/13	Time: arrive 12:10pm depart 1:30pm
Project Name: SYMPHONY	Project Number: 0224198
Site Location: LIDDELL	Sampler: TH
Well ID: LE_MW05	Weather: Hot.

Equipment

Water quality equipment description: —

Interface probe number: Geotech IP#4261 30m

bottom of well easily identified with probe, indicative of little sediment accumulated

Purging equipment: (please circle)						
	Bailer type:	Plastic	Teflon			
	Pump type:	Peristaltic	Submersible (circled)	~~Micro-purge~~	Amazon	Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm (circled)	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 6.973 m (-) Water level 2.246 m (=) Water Column 4.727 m

Water Column 4.727 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 9.26 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y / N (N circled)

Water Quality Parameters

Beginning purge time: | Ending purge time: | Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
20	12:40pm							Light brown turbidity - odour clearing at times allowed recharge
5L.	12:52pm							As above.
1.5	1pm							As above.
2L	1:20pm							mostly clear, odour

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

28.5. **Total Well Volume** Actual amount of water prior to sampling — Sample time — Containers used —

Flow rate mL/minute — Did field parameters stabilise? Y ~~N~~ ~~NA~~ — Was the well dry purged? Y N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N			
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N			
Was documentation of equipment conducted?	Y	N	NA		
Were air bubbles present in vials at time of collection?	Y	N	NA		
Was sample for metals field filtered prior to preservations?	Y	N	NA		
Duplicate sample collected?	Y	N		Duplicate sample ID	
Rinsate blank collected?	Y	N		Rinsate blank ID	

Groundwater - Well Sampling Data Form

ERM

Job Information

Date: 22/11/13	Time: arrive 13:50 depart
Project Name: Project Symphony	Project Number: 0224198
Site Location: Liddell	Sampler: N.H
Well ID: LE_MW06	Weather: overcast

Equipment

Water quality equipment description: NA Interface probe number: SYD 3954

Purging equipment: (please circle)
Bailer type: Plastic Teflon
Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 5.640 m (-) Water level 2.440 m (=) Water Column 3.2 m

Water Column 3.20 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 6.272 L

Depth to product: _____ m Product Thickness: _____ m Verified with Bailer: Y / N

Water Quality Parameters

Beginning purge time: 13:55 Ending purge time: 14:15 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
10	1400							brown, turbid becoming clear after 5L. Purged dry after 10L. No odour. Allowed to recharge.
14	14:05							Clear, purged dry after another 4L. Allowed to recharge
17	14:10							Clear, no odour. Purged dry after 3L
19	14:15							Clear, no odour. Purged another 2L. Dry.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

Total Well Volume
Actual amount of water prior to sampling

Flow rate
mL/minute

Sample time _____ Containers used _____

Did field parameters stabilise? Y / N / NA Was the well dry purged? Y / N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID _____
Rinsate blank collected?	Y	N	Rinsate blank ID _____

Groundwater - Well Sampling Data Form

ERM

WELL DEVELOPMENT

Job Information

Date: 3/12/13	Time: arrive 2:10pm depart
Project Name: SYMPHONY	Project Number: 224198
Site Location: LIDDELL - LE	Sampler: Tim Hayden
Well ID: LE_MW07	Weather: Hot

Equipment

Water quality equipment description: —

Interface probe number: Geotech IP#4261. 30m

Purging equipment: (please cirlce)

Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

bottom of well easily identified - little sediment appears to be accumulated at bottom of well.

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 6.898 m (-) Water level 3.090 m (=) Water Column 3.808 m

Water Column 3.808 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 7.46 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y N

Water Quality Parameters

Beginning purge time: Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
8	2:30pm							clear, odour, allowed to recharge.
5L.	3:05pm							clear, odour allowed to recharge.
2L	3:15pm							clear odour allowed to recharge
1.5	3:20pm.							As above.
1	3:29pm							As above, now slow to recharge considered developed.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

Total Well Volume Actual amount of water prior to sampling

Flow rate mL/minute

Sample time — Containers used —

Did field parameters stabilise? ~~Y~~ ~~N~~ NA

Was the well dry purged? Y N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID ____
Rinsate blank collected?	Y	N	Rinsate blank ID ____

Groundwater - Well Sampling Data Form

ERM

Job Information	
Date: ~~3/12/13~~ 3/12/13	Time: arrive 12:45pm depart
Project Name: Symphony	Project Number: 324198
Site Location: LIDDELL	Sampler: JM
Well ID: LE_MW08	Weather: Hot.

WELL DEVELOPMENT

Equipment

Water quality equipment description: —

Interface probe number: Geotech IP 30m #4261

bottom of well easily identified with probe, little sediment accumulated.

Purging equipment: (please cirlce)

Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth: 6.803 m (-) Water level: 2.934 m (=) Water Column: 3.869 m

Water Column: 3.87 m (x) Conversion Factor: 1.96 (=) Litres per 1 Well Volume: 7.58 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y (N)

Water Quality Parameters

Beginning purge time: Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
10.00	1pm							clear (small volume of brown turbid water at start of purging) odour: allowed to recharge
3.5L	2.10pm							clear, odour - allowed to recharge.
2L.	2:25pm							slight brown turbidity no odour.
2.65L	2.30.							consider purged dry - slow to recharge.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

Total Well Volume
Actual amount of water prior to sampling

Sample time: — Containers used: —

Flow rate
mL/minute

Did field parameters stabilise? Y N NA

Was the well dry purged? Y N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID: —
Rinsate blank collected?	Y	N	Rinsate blank ID: —

Groundwater - Well Sampling Data Form

ERM

WELL DEVELOPMENT

Job Information

Date: 3/12/13	Time: arrive 11:40 depart 12:30
Project Name: Symphony	Project Number: 224198
Site Location: LIDDELL	~~Sampler~~: DEVELOPER: TH
Well ID: LE-MW089	Weather: HOT

Equipment

Water quality equipment description: —— Interface probe number: IP 4261 Geotech 30m

Purging equipment: (please cirlce) Bailer type: Plastic Teflon

Pump type: Peristaltic Submersible Micro-purge Amazon Other:

bottom of well easily identified with probe, indicative of little sediment accumulated.

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 7.031 m (-) Water level 2.868 m (=) Water Column 4.163 m

Water Column 4.163 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 8.16 L

Depth to product: —— m Product Thickness: —— m Verified with Bailer: ~~Y~~ N

Water Quality Parameters

Beginning purge time: Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
15	10:50							light brown turbidity clearing with pumping, odour.
~~15~~	~~10:55~~							allowed to recharge 5 mins
3	10:55							Allowed to recharge further.
1.5	11AM							Allowed to recharge further
0.75	12:13							considered purged dry.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

20.25L **Total Well Volume** Actual amount of water prior to sampling

Flow rate mL/minute

Sample time —— Containers used ——

Did field parameters stabilise? ~~Y~~ ~~N~~ ~~NA~~ Was the well dry purged? Y ~~N~~

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N		
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N		
Was documentation of equipment conducted?	Y	N	~~NA~~	
Were air bubbles present in vials at time of collection?	Y	N	NA	
Was sample for metals field filtered prior to preservations?	Y	N	NA	
Duplicate sample collected?	Y	N		Duplicate sample ID ——
Rinsate blank collected?	Y	N		Rinsate blank ID ——

Groundwater - Well Sampling Data Form

ERM

Well Development

Job Information	
Date: 12/12/13	Time: arrive 13:00 depart
Project Name: Symphony	Project Number: 0224198
Site Location: Liddell	Sampler: N.H
Well ID: LG-MW01	Weather: Fine, hot

Equipment

Water quality equipment description: NA * Interface probe number: Testwell 9300159.

Purging equipment: (please cirlce) Bailer type: Plastic Teflon

Pump type: Peristaltic Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 7.875 m (-) Water level 2.360 m (=) Water Column 5.515 m

Water Column 5.515 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 10.81 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y / ~~N~~ NA

Water Quality Parameters

Beginning purge time: 13:10 Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
13:15	20							turbid, black, no odour.
13:20	40							becoming clear after 20L.
13:25	60							actively recharging as pumping
13:30	80							good recharge.
13:35	100							~10 well volumes removed.
								Developed.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

100 **Total Well Volume** Actual amount of water prior to sampling

Flow rate mL/minute

Sample time — Containers used —

Did field parameters stabilise? Y N NA

Was the well dry purged? Y N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID ____
Rinsate blank collected?	Y	N	Rinsate blank ID ____

Groundwater - Well Sampling Data Form

ERM

WELL DEVELOPMENT	Job Information
Date: 12/12/13	Time: arrive 09:45 depart
Project Name: Symphony	Project Number: 0224198
Site Location: Liddell	Sampler: N.H
Well ID: LG_MW02	Weather: Fine.

Equipment

Water quality equipment description: NA

Interface probe number: Testwell 9300159

Purging equipment: (please circle)

Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 6.045 m (-) Water level 2.180 m (=) Water Column 3.865 m

Water Column 3.865 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 7.58 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y / N NA

Water Quality Parameters

Beginning purge time: 09:55 Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
14	10:00							V. turbid black no odour. Purged dry after 14L. Allowed to recharge.
24	10:10							becoming cloudy to clear after 18L.
32	10:20							clear to cloudy, no odour
42	10:30							
50	10:40							~10 well volumes removed
60	10:50							Developed
70	11:00							

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

Total Well Volume Actual amount of water prior to sampling

Flow rate mL/minute

Sample time _____ Containers used _____

Did field parameters stabilise? Y / N / NA

Was the well dry purged? Y / N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID _____
Rinsate blank collected?	Y	N	Rinsate blank ID _____

Groundwater - Well Sampling Data Form

ERM

WELL DEVELOPMENT.

Job Information

Date: 12/12/13	Time: arrive 11:20 depart 12:10
Project Name: Symphony	Project Number: 0224198
Site Location: Liddell	Sampler: N.H
Well ID: LG-MW03	Weather: Fine

Equipment

Water quality equipment description: NA. Interface probe number: Testwell 9300159

Purging equipment: (please circle)
Bailer type: Plastic Teflon
Pump type: Peristaltic (Submersible) Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 8.020 m (-) Water level 2.330 m (=) Water Column 5.69 m

Water Column 5.69 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 11.15 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y (N) NA.

Water Quality Parameters

Beginning purge time: 11:30 Ending purge time: 12:00 Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
20	11:35							black, turbid, slight H.C odour.
40	11:40							becoming cloudy to clear after 20L. slight H.C odour
60	11:45							clear, slight H.C odour
80	11:50							Actively recharging as pumping
100	11:55							
110	12:00							~10 well volumes removed. developed

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

110. **Total Well Volume** Actual amount of water prior to sampling

Flow rate mL/minute

Sample time — Containers used —

Did field parameters stabilise? Y N (NA) Was the well dry purged? Y (N)

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID —
Rinsate blank collected?	Y	N	Rinsate blank ID —

Groundwater - Well Sampling Data Form

ERM

Job Information

WELL DEVELOPMENT.

Date: 9/12/13	Time: arrive 3:20 pm depart 4:30pm
Project Name: Symphony	Project Number: 0224198
Site Location: Lindell	Sampler: TH
Well ID: LH-MW01	Weather: Cloudy + Hot

Equipment

Water quality equipment description: —— Interface probe number: Geotech #4261 30m

Purging equipment: (please cirlce) Bailer type: Plastic Teflon

Pump type: Peristaltic **Submersible** ~~Micro-purge~~ Amazon Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 7.913 m (-) Water level 1.568 m (=) Water Column 6.345 m

Water Column 6.345 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 12.44 L

Depth to product: —— m Product Thickness: —— m Verified with Bailer: Y / N (N circled)

Water Quality Parameters

Beginning purge time: Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
29	3:38	—	—	—	—	—	—	~~Brown turbid~~, clearing with continued pumping. ~~no odour~~ ~~pumping ceased~~.
10L	3:40	—	—	—	—	—	—	As above.
10L	3:50	—	—	—	—	—	—	As above.
7L	3:55	—	—	—	—	—	—	~~As above~~ pump use to agitate bottom of well.
4L	4pm	—	—	—	—	—	—	As above.
9L	4:07pm	—	—	—	—	—	>	As above
6L	4:15pm	—	—	—	—	—	—	" "
5L	4:20pm	—	—	—	—	—	—	As above.

STOPPED PUMPING - TIME CONSTRAINTS 76 WELL VOL REMOVED - CONSIDERED DEVELOPED

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

80L	**Total Well Volume** Actual amount of water prior to sampling
	Flow rate mL/minute

Sample time —— Containers used ——

Did field parameters stabilise? Y N NA (struck through) Was the well dry purged? Y N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID ______
Rinsate blank collected?	Y	N	Rinsate blank ID ______

Groundwater - Well Sampling Data Form

ERM

WELL DEVELOPMENT

Job Information

Date: 9/12/13	Time: arrive 12:50pm depart
Project Name: SYMPHONY	Project Number: 0224198
Site Location: LIDDELL-LH	Sampler: TH
Well ID: LH_MW02	Weather: HOT & CLEAR.

Equipment

Water quality equipment description: Interface probe number: Geotech IP 30m #4261

Purging equipment: (please circle)

Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 7.913 m (-) Water level 2.056. m (=) Water Column 5.857 m

Water Column 5.86 m (x) Conversion Factor 1.96. (=) Litres per 1 Well Volume 11.49. L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y (N)

Water Quality Parameters

Beginning purge time: Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
12L	1:30 – 2:10	—						Pumping began to slow after 25-30L, predominately clear after initial cloudiness. no odor apparent. recharge appears to be sufficient to maintain pumping. Aflow rate after 90L was very slow.

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

Total Well Volume Actual amount of water prior to sampling

Flow rate mL/minute

Sample time — Containers used —

Did field parameters stabilise? Y N NA Was the well dry purged? Y (N)

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID —
Rinsate blank collected?	Y	N	Rinsate blank ID —

Groundwater - Well Sampling Data Form

WELL DEVELOPMENT.

Job Information

Date: 9/12/13	Time: arrive 4:00pm depart 5:30pm
Project Name: SYMPHONY	Project Number: 324198
Site Location: LIDDELL - LH	Sampler: TH
Well ID: LH_MW03	Weather: cloudy + Hot.

Equipment

Water quality equipment description: — Interface probe number: Geotech IP 42613 30m

Purging equipment: (please cirlce)

Bailer type: **Plastic** **Teflon**

Pump type: **Peristaltic** **Submersible** **Micro-purge** **Amazon** **Other:**

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth 7.938 m (-) Water level 1.846 m (=) Water Column 6.092 m

Water Column 6.092 m (x) Conversion Factor 1.96 (=) Litres per 1 Well Volume 11.94 L

Depth to product: — m Product Thickness: — m Verified with Bailer: Y (N)

Water Quality Parameters

Beginning purge time: Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
10L	4:40	—						brown turbidity, clean with purge hydrocarbon odour present purge stopped to empty catchment
4L	4:54	—						as above
1L	5pm	—						as above
		required to leave site 5:10pm - to continue tomorrow						

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

25.

Total Well Volume Actual amount of water prior to sampling

Flow rate mL/minute

Sample time — Containers used —

Did field parameters stabilise? Y N NA

Was the well dry purged? Y N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N		
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N		
Was documentation of equipment conducted?	Y	N	NA	
Were air bubbles present in vials at time of collection?	Y	N	NA	
Was sample for metals field filtered prior to preservations?	Y	N	NA	
Duplicate sample collected?	Y	N		Duplicate sample ID —
Rinsate blank collected?	Y	N		Rinsate blank ID —

Groundwater - Well Sampling Data Form

ERM

WELL DEVELOPMENT

Job Information

Date: 10/12/13	Time: arrive 8.45. depart 9.30.
Project Name: SYMPHONY.	Project Number: 0224198
Site Location: LIDDELL	Sampler: TH
Well ID: LH_MW03.	Weather: CLEAR.

Equipment

Water quality equipment description: — Interface probe number: —

Purging equipment: (please cirlce) Bailer type: Plastic Teflon
Pump type: Peristaltic **Submersible** (circled) Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm (circled)	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.49	1.96	7.85	12.3	17.7	31.4	49.1	70.7

Volume of water in well / V = P r x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth (-) Water level (=) Water Column
_______ m (-) _______ m (=) _______ m

Water Column (x) Conversion Factor (=) Litres per 1 Well Volume
_______ m (x) _______ (=) _______ L

Depth to product: _______ m Product Thickness: _______ m Verified with Bailer: Y N

Water Quality Parameters

Beginning purge time: Ending purge time: Pump Intake Depth (mbtoc):

Litres	Time	PH	Temp °C	Cond mS/cm	DO mg/L	Redox mV	Drawdown <10cm	Comments
25L	8:50	PUMPING COMMENCED FROM YESTERDAY						hydrocarbon odour, brown turbidity clearing with depth, pumping ceased as no water being returned.
3L.	9AM.	—	—	—	—	—		odour not apparent brown turbid, pumping stopped as no water being returned.
22L	9:15.							As above
0.5	9:25.	—	—	—	—	—		As above
	OVER 9&10 DEC 2013, 50.5 L REMOVED.							
	7.4 WELL VOLUMES - SLOW RECHARGING WELL CONSIDERED DEVELOPED.							

*pH, temp, cond readings not necessary if well is purged dry

Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour / drawdown depth

25.5	**Total Well Volume** Actual amount of water prior to sampling	Sample time — Containers used —
	Flow rate mL/minute	Did field parameters stabilise? Y N NA Was the well dry purged? Y N

Field QC Checks

Was pre-cleaned sampling equipment used for these samples?	Y	N	
Was pre-cleaning sampling equipment properly protected from contamination?	Y	N	
Was documentation of equipment conducted?	Y	N	NA
Were air bubbles present in vials at time of collection?	Y	N	NA
Was sample for metals field filtered prior to preservations?	Y	N	NA
Duplicate sample collected?	Y	N	Duplicate sample ID _______
Rinsate blank collected?	Y	N	Rinsate blank ID _______